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Balancing Environmental Conservation and Economic Development in Mountain Regions: An MCDM Analysis of Türkiye's Eastern Black Sea

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Abstract. Mountainous regions often face geographical constraints, limited economic diversity, infrastructure deficiencies, and unequal access to markets and public services. In this context, policies aimed at promoting regional development are crucial. Türkiye's Eastern Black Sea region is well-suited for examining such a challenge. This study assumes that alternative regional development pathways can produce significantly different economic benefits and environmental costs. The aim of the study is to find the best sustainable development path using Multi-Criteria Decision Making (MCDM) techniques. Four alternative pathways are considered: conventional growth-oriented development, green economic transformation, nature-based regional development, and integrated climate-resilient development. Their performance was tested against twelve criteria grouped into four dimensions: economic and regional development, biodiversity and natural capital, climate and environmental sustainability, and landscape, cultural and social sustainability. The Logarithmic Additive Weighting Coefficient Estimation (LAAW) method was used to evaluate the criteria. The four sustainable development pathways identified using weighted criteria were ranked using the Q-rung Orthopair Fuzzy Set (q-ROFS)-based Complex Proportional Assessment (COPRAS) method. To test the validity and structural stability of the proposed decision support system, the findings were comparatively analyzed using q-ROFS-based Weighted Aggregated Sum Product Assessment (WASPAS) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) methods. The results were obtained as $A_4 > A_3 > A_2 > A_1$. Integrated Climate-Resilient Development was determined to be the most effective sustainable development strategy for Türkiye.

Keywords: Sustainability, Climate change, MCDM, q-ROFS, LAAW, Economic development

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1. Introduction

Mountain regions are socio-ecological systems in which economic development is particularly related to the availability and quality of natural resources (Booth, 1999). Existing forests, freshwater systems, and biodiversity affect the local livelihoods, land use, and culture while contributing to broader economic and social welfare (Fang and Ying, 2016). At the same time, mountainous regions are often challenged by geographical constraints, limited economic diversification, infrastructure deficiencies, and unequal access to markets and public services. In that respect, policies aimed at stimulating regional development have direct and indirect impacts on biodiversity, landscape, and social life. When economic growth policies put excessive pressure on ecosystems and natural resources, short-term development gains cost the loss of natural capital on which long-term prosperity depends (England, 2000; Jean et al., 2025).



This trade-off has become increasingly apparent under climate change. Mountain ecosystems are particularly sensitive to natural degradation caused by climate change (Bastien-Olvera et al., 2024). Economic activities, together with land-use transformations, exacerbate habitat fragmentation, deforestation, water-resource pressure, pollution, and landscape degradation. Consequently, sustainable development in mountainous regions requires development policies that reconcile economic, ecological, climatic, and social objectives (Miao et al., 2025).

Türkiye's Eastern Black Sea presents a highly relevant setting for examining such a challenge. The region is characterized by mountainous terrain, extensive forests, rich biodiversity, dense river networks, highlands, and traditional “yayla” culture (Somuncu, 2010). These environmental and cultural features shape the local livelihoods and economic activities. At the same time, the region has been experiencing a structural transformation with industrial and infrastructure investments, hydropower development, and rapidly growing tourism activities (Koçak and Şarkgüneşi, 2017). While contributing to economic growth with renewable energy production and income generation, inadequate environmental flows and associated construction in urban expansion adversely affect ecosystems, biodiversity, and landscapes (Capik et al., 2012; Somuncu, 2016).

Economic growth of the region interacts with significant environmental and climatic vulnerabilities. The Eastern Black Sea is Türkiye's wettest basin (Aksu, 2025). It is particularly subject to extreme floods, and climate projections reveal substantial changes in temperature and precipitation conditions in the near future (Nacar et al., 2024). Evidence indicates that anthropogenic land-use changes can increase landslide occurrence (Glade, 2003; Li et al., 2020), demonstrating that development policy choices and natural hazards cannot be considered independently (Hoang and Liou, 2024; Kelman, 2020; Klomp and Valckx, 2014). As a result, economic growth needs to be planned alongside biodiversity conservation, freshwater ecosystem protection, climate resilience, landscape integrity, and the preservation of traditional livelihoods (Mitra and Paul, 2025; Aşıcı, 2013; Dietz and Adger, 2003).

This study premises that alternative regional development pathways can generate significantly different economic benefits and environmental costs. Accordingly, the study hypothesizes that development strategies integrate economic transformation with biodiversity conservation and natural-capital protection. Moreover, climate resilience should be taken into account to balance regional development and environmental conservation rather than conventional growth-oriented approaches (Goswami et al., 2026). Formulating such a problem requires a framework capable of assessing alternative development pathways across multiple and conflicting constraints.

The aim of this study is therefore to evaluate alternative sustainable development pathways for Türkiye's Eastern Black Sea region through a multi-criteria decision-making (MCDM) framework. Four alternative pathways are considered: conventional growth-oriented development, green economic transformation, nature-based regional development, and integrated climate-resilient development. Their performance is tested for twelve criteria grouped under four dimensions: economic and regional development, biodiversity and natural capital, climate and environmental sustainability, and landscape, cultural and social sustainability. The objective of the study is to identify the economic and environmental trade-offs associated with development pathways, determine their relative performance across multiple criteria, and eventually identify the one that most balance contradicting environmental, social, and economic dimensions for long-term mountain development.

In this study, the Logarithmic Additive Estimation of Weight Coefficients (LAAW) method is used to evaluate the criteria. Four sustainable development paths, determined using weighted criteria, are ranked using the Q-Rung Orthopair Fuzzy Sets (q-ROFS)-based Complex Proportional Assessment (COPRAS) method.



The study aims to contribute to the design of development policies for environmentally sensitive mountain regions by bringing economic development and environmental conservation together within a decision framework. The Eastern Black Sea case illustrates this policy challenge confronted by mountain economies: economic growth is necessary for improving regional welfare, yet activities that deteriorate natural capital weaken the basis of sustainable economic prosperity.

The rest of the paper is organized as follows: Section 2 provides a detailed account of the literature studies conducted in this field. Section 3 defines the problem, identifies the criteria and alternatives. The criterion weighting and alternative ranking methods used in the study are explained in detail. Section 4 presents the application results step-by-step in tables. Section 5 is the discussion section. Finally, Section 6 presents the conclusions.

2. Literature Review

The relationship between economic development and environmental conservation has long been the focus of the sustainability literature. The issue becomes especially critical in mountain regions. Economic opportunities in these regions are constrained by geographical conditions, so economic development depends heavily on natural resources, ecosystems, and landscapes. The literature relevant to this problem can be organized around four topics: the growth and environment relationship, natural capital and biodiversity, the specific vulnerabilities of mountain economies, and the interaction of development pressures with climate and environmental risks.

2.1. Economic Growth, Natural Capital and Environmental Conservation

The relationship between economic growth and the environment has an extensive literature. Using cross-country panel data, Aşıcı (2013) demonstrates that economic growth can cause significant environmental pressures depending on the structure and characteristics of the growth process. Therefore, the major policy question is about how economic growth is achieved. In a more recent work, Goswami et al. (2026) similarly emphasize the multidimensional relationship between economic growth and climate change, showing that sustainability outcomes cannot be understood through income growth.

England (2000) argues that traditional economic growth theories may underestimate the role of natural capital in development and questions the substitutability of natural assets by produced capital. More recently, Jean et al. (2025) have revisited the relationship between natural capital and economic growth. They point to the importance of considering natural capital as a component of long-term economic capacity instead of treating environmental concerns as just a constraint to growth policies. Furthermore, climate change complicates this relationship because its effects on natural capital are uneven across countries and ecosystems. Bastien-Olvera et al. (2024) show that climate change has a significant role in the global value of natural capital, that are distributed unequally.

Biodiversity is an important component of natural capital. Dietz and Adger (2003) examine the relation between economic growth and biodiversity and demonstrate that economic growth does not necessarily generate sufficient incentives for biodiversity protection. The result is important especially for environmentally sensitive regions. While economic growth can provide resources for environmental protection, it also increases the stress on biodiversity.

2.2. Development Challenges Specific to Mountain Regions

Mountain economies differ from low-land regions due to accessibility constraints, dispersed settlements, vulnerable ecosystems, higher infrastructure costs, and strong dependence on locally available environmental resources. Booth (1999) examines economic development in the Mountain West. The study highlights the heterogeneous economic development within mountain territories caused by spatial characteristics of the regions. Similarly, Fang and Ying (2016) demonstrate variable levels and structures of economic development across mountainous regions in China. These studies suggest that economic



development in mountain regions cannot be approached through standard growth strategies. Geographical and ecological characteristics of the region should be incorporated into policies.

Miao et al. (2025) examine the priority implementation of Sustainable Development Goals in underdeveloped mountain regions. They emphasize the need to balance multiple development objectives rather than targeting economic, environmental, or social targets independently. Their perspective is closely related to the current study.

The Eastern Black Sea Mountains of Türkiye constitute a relevant case. Somuncu (2010) identifies sustainable development challenges in the region that result from the impacts of changing economic activities on distinctive ecological characteristics of the region. The region possesses environmental and cultural assets. However, expanding transportation networks, energy investments, tourism, settlement, and other economic activities have eroded natural capital.

Tourism illustrates this tension particularly clearly. There is a lot of evidence in the literature that mountain tourism can diversify regional economies, create employment, and provide markets for local goods and services (Gherdan et al., 2025). At the same time, rapid tourism development may result in rapid construction and landscape transformation, increased resource consumption, and the commercialization of cultural assets (Mouhou, 2025; Ali, 2023). Somuncu (2016) specifically examines the commercialization of cultural heritage associated with tourism in the Eastern Black Sea Mountains. Tourism-led development may harm the preservation of traditional mountain culture. More broadly, Mitra and Paul (2025) emphasize the need to balance tourism growth with cultural heritage conservation and environmental stability in mountain regions. Indeed, nature and culture may function as economic resources supporting tourism.

2.3. Energy, Water Resources and Environmental Externalities

Energy production represents another major component of the environment–growth dilemma in the Eastern Black Sea. Hydropower has a significant role in Türkiye's renewable energy strategy. The steep topography and dense river systems of the Eastern Black Sea provide a strong potential for hydropower development. Capik et al. (2012) demonstrate the economic and energy significance of small hydropower in the region. At a broader geographical scale, Koçak and Şarkgüneşi (2017) find an important relationship between renewable energy use and economic growth in Black Sea and Balkan countries.

However, hydropower comes with its local environmental costs. It contributes positively to low-carbon energy production while altering river flows, freshwater habitats, landscapes, and other ecosystem functions (Botelho, 2017). Industrial expansion, transport infrastructure, and intensive tourism may improve income, employment, and accessibility. However, they impose environmental costs through pollution, habitat fragmentation, land-use change, and pressure on water resources. The cumulative effects of such activities can be dramatic in mountain ecosystems because environmental disturbances can interact with existing physical vulnerabilities.

2.4. Climate Change, Land-Use Pressure and Disaster Resilience

Climate change adds a further dimension to this tension. Nacar et al. (2024) project changes in temperature and precipitation in the Eastern Black Sea. The future climatic conditions of Türkiye's wettest basin may shift the environmental constraints on development decisions. Therefore, development strategies need to be evaluated in terms of their capacity to remain consistent under changing climatic conditions.

Mountain regions are highly vulnerable to hydro-meteorological hazards such as floods and landslides. The literature increasingly shows that these hazards are not determined solely by natural conditions. Kelman (2020) emphasizes that disasters may emerge with human choices. Glade (2003) reveals the relationship between land-use change and landslide occurrence. Li et al. (2020) show how human activities influence the development of landslide susceptibility. Comparable evidence from mountainous regions indicates that anthropogenic activities can also increase flash-flood susceptibility (Hoang and Liou, 2024). At the



macroeconomic level, natural disasters also have direct economic consequences, although their magnitude and direction vary substantially across contexts and disaster types (Klomp and Valckx, 2014). Economic development and disaster resilience should not be treated as distinct policy areas. The form of development process can influence environmental risks.

2.5. Research Gap and Positioning of the Study

The existing literature provides evidence regarding individual dimensions of sustainable development in mountain regions. One strand examines the relationship between economic growth, environmental pressure, biodiversity, and natural capital (Aşıcı, 2013; Dietz and Adger, 2003; England, 2000). Another emphasizes the particular development conditions and sustainability challenges of mountainous regions (Booth, 1999; Fang and Ying, 2016; Miao et al., 2025). Meanwhile, the disaster and land-use literature demonstrates that development decisions can alter vulnerability to floods and landslides (Glade, 2003; Hoang and Liou, 2024; Li et al., 2020).

Economic growth, energy demand, tourism, biodiversity, climate change, landscape, and disaster resilience represent interconnected components of the same regional development problem. Yet, to the best of our knowledge, no previous study has evaluated these dimensions simultaneously within a common framework in order to compare alternative development pathways. Nevertheless, a development strategy performing favorably according to one objective may generate substantial costs under another. Hydropower may contribute to renewable energy production while affecting river ecosystems. Tourism activities may increase local income while increasing stress on landscape and cultural heritage. Industrial and infrastructure development may increase output and employment while generating pollution and habitat fragmentation.

The present study addresses this gap by conceptualizing sustainable development in the Eastern Black Sea as a multi-criteria regional decision problem. It compares four alternative development pathways: conventional growth-oriented development, green economic transformation, nature-based regional development, and integrated climate-resilient development. These alternative pathways are tested across economic, biodiversity and natural-capital, climate and environmental, and landscape, cultural and social dimensions. Such an integrated approach allows the trade-offs identified across the literature to be incorporated into a common analytical framework and provides a basis for identifying development strategies capable of balancing environmental conservation with long-term regional economic development.

3. The Method

3.1. Problem Definition

The decision problem is defined as the selection of a regional development pathway that balances economic development and environmental protection while keeping climate resilience and socio-cultural sustainability in Türkiye's Eastern Black Sea Mountain region. To address this problem, four alternative development pathways are evaluated using twelve criteria representing four sustainability dimensions.

The q-ROFS-based COPRAS method is used to effectively evaluate four sustainability dimensions: Conventional Growth-Oriented Development, Green Economic Transformation, Nature-Based Regional Development, and Integrated Climate-Resilient Development. The main objective of the study is to select the most effective development path in Türkiye in terms of sustainability dimensions.

3.2. Definition of Alternatives

The alternatives represent different development focuses rather than projects. In this way, industrial development, energy production, tourism, infrastructure, and nature-based activities are considered as



components of broader development pathways. Then, their economic and environmental trade-offs are assessed within a decision framework.

A₁ – Conventional Growth-Oriented Development: This pathway prioritizes economic output, industrial expansion, infrastructure investment, energy production, and tourism growth. Environmental protection is addressed through existing regulatory mechanisms rather than acting as a central focus on development. Such a strategy may generate substantial short-term economic benefits. However, economic expansion can also increase stress on environmental pressures (Aşıcı, 2013; Dietz and Adger, 2003).

A₂ – Green Economic Transformation: This pathway still takes economic development as a major regional objective while seeking to reduce its environmental intensity. It emphasizes cleaner industrial production, resource and energy efficiency, pollution control, environmentally responsible renewable energy development, greener infrastructure, and improved environmental standards. Environmental impacts are expected to be associated with investment and production decisions. It focuses on natural capital as a productive asset supporting long-term economic development (England, 2000; Jean et al., 2025).

A₃ – Nature-Based Regional Development: This pathway gives priority to economic activities that provide incentives for preserving the region's natural and cultural assets, such as sustainable agriculture and forestry. While restricting industrial, infrastructure, and energy development, local products, ecosystem-compatible livelihoods, ecotourism, and small-scale cultural and nature-based tourism is prioritized. (Mitra and Paul, 2025; Somuncu, 2016).

A₄ – Integrated Climate-Resilient Development: This pathway combines economic transformation, biodiversity and ecosystem conservation, sustainable tourism, and energy and climate-resilient infrastructure within an integrated regional strategy. This approach reflects the increasing emphasis on integrated sustainability priorities in underdeveloped mountain regions (Miao et al., 2025). It also recognizes the effects of climate change on natural capital (Bastien-Olvera et al., 2024).

3.3. Evaluation Criteria

The evaluation criteria are derived from the major challenges identified in the literature. To maintain a solid framework suitable for the regional decision problem, twelve criteria were organized under four dimensions: Economic and Regional Development; Biodiversity and Natural Capital; Climate and Environmental Sustainability; and Landscape, Cultural and Social Sustainability. The table below summarizes the criteria:

MC₁: Economic and Regional Development Dimension:

C₁ – Regional Economic Value Creation (max): Contribution to regional output and economic activity.

C₂ – Local Employment and Income Generation (max): Capacity to create local employment and generate income.

C₃ – Economic Diversification and Resilience (max): Capacity to diversify regional economic activities and reduce dependence on a limited number of sectors.

MC₂: Biodiversity and Natural Capital

C₄ – Biodiversity Conservation (max): Protection of species diversity and ecologically sensitive areas.

C₅ – Terrestrial Habitat and Ecosystem Integrity (max): Preservation of forests, mountain habitats, and ecological connectivity.

C₆ – Freshwater Ecosystem and Water Resource Protection (max): Protection of rivers and ecosystems.

MC₃: Climate and Environmental Sustainability



C₇ – Climate Change Mitigation (max): Contribution to low-carbon development and reduction of greenhouse-gas emissions.

C₈ – Climate and Disaster Resilience (max): Capacity to reduce vulnerability and increase resilience to climate change, floods, landslides, erosion, and extreme weather.

C₉ – Pollution and Environmental Pressure (min): Air, water, and soil pollution, waste generation, and other environmental burdens.

MC₄: Landscape, Cultural and Social Sustainability

C₁₀ – Landscape Integrity (max): Preservation of mountain landscapes and avoidance of physical and visual degradation.

C₁₁ – Cultural Heritage and Traditional Livelihood Preservation (max): Preservation of local cultural heritage, yayla culture, traditional practices, and livelihoods.

C₁₂ – Community Well-being and Social Acceptance (max): Contribution to local quality of life and compatibility with community interests and preferences.

These twelve criteria provide a multidimensional representation of the trade-off examined in this study. Sustainable development of mountainous regions requires simultaneous consideration of economic benefits, natural-capital preservation, climate and environmental resilience, and landscape and socio-cultural sustainability. The resulting four-alternative, twelve-criterion decision structure forms the basis for the subsequent MCDM analysis.

3.4. Analysis

Fuzzy set concepts were first introduced to the literature by Zadeh (1965). Some situations cannot be clearly expressed as 0 or 1, leading to the creation of fuzzy expressions (Mokhtarian, 2011). The application area of fuzzy logic is quite broad. In this study, it was used in the selection of Sustainable Development Plans. Twelve predetermined criteria were weighted using the Fuzzy LAAW algorithm. Four alternatives were ranked using the q-ROFS-based COPRAS method.

3.4.1. Logarithmic Additive Estimation of Weight Coefficients (LAAW)

LAAW is a novel methodology based on the logarithmic evaluation of the relationship between the criterion priority vector and the absolute anti-ideal point (Pamucar et al., 2021). One of the most important advantages of the LAAW method is that it does not become more complex as the number of criteria increases. It eliminates uncertainties arising from expert preferences (Deveci et al., 2021).

In this study, the Fuzzy LAAW algorithm was used to determine the criterion weights. The terms in Table 1 were used as fuzzy linguistic terms.

Table 1. Fuzzy linguistic scale for criteria evaluation.

Linguistic terms	Membership function
------------------	---------------------



Very low (VL)	(1,2,3)
Low (L)	(2,3,4)
Medium low (ML)	(3,4,5)
Medium (M)	(4,5,6)
Medium high (MH)	(5,6,7)
High (H)	(6,7,8)
Very high (VH)	(7,8,9)

Step 1. Determining the fuzzy priority vector.

The study includes k experts ($\Omega = \{\Omega_1, \Omega_2, \dots, \Omega_k\}$) who evaluate n criteria ($C = \{C_1, C_2, \dots, C_n\}$).

Experts evaluate the criteria by assigning Triangular Fuzzy Numbers (TFNs). The fuzzy priority vector assigned by the t . expert ($1 \leq t \leq k$) to the n . criterion is obtained as $\Upsilon^t = (\tilde{\theta}_1^t, \tilde{\theta}_2^t, \dots, \tilde{\theta}_n^t)$. An element in this vector is shown as $\tilde{\theta}_j^t = (\theta_j^{(l)t}, \theta_j^{(m)t}, \theta_j^{(u)t})$.

Step 2. Defining the Absolute Anti-Ideal Point ($\tilde{\xi}_{AIP}$)

Absolute Anti-Ideal Point is explained by Eq. (1).

$$\tilde{\xi}_{AIP} < \min(\tilde{\theta}_j^t, \tilde{\theta}_j^t, \dots, \tilde{\theta}_j^t) \quad (1)$$

Step 3. Calculation of the combined fuzzy relation vector.

To bring together the assessments of all experts under a single framework, a combined fuzzy priority vector $\Upsilon = (\tilde{\theta}_1, \tilde{\theta}_2, \dots, \tilde{\theta}_n)$ was calculated using the Bonferroni function in Eq. (2).

$$\tilde{\theta}_j = (\theta_j^{(l)}, \theta_j^{(m)}, \theta_j^{(u)}) = \left(\left(\frac{1}{k(k-1)} \sum_{x=1}^k (\theta_j^{(l)(x)})^{\alpha_1} \sum_{y=1, y \neq x}^k (\theta_j^{(l)(y)})^{\alpha_2} \right)^{\frac{1}{\alpha_1 + \alpha_2}}, \left(\frac{1}{k(k-1)} \sum_{x=1}^k (\theta_j^{(m)(x)})^{\alpha_1} \sum_{y=1, y \neq x}^k (\theta_j^{(m)(y)})^{\alpha_2} \right)^{\frac{1}{\alpha_1 + \alpha_2}}, \left(\frac{1}{k(k-1)} \sum_{x=1}^k (\theta_j^{(u)(x)})^{\alpha_1} \sum_{y=1, y \neq x}^k (\theta_j^{(u)(y)})^{\alpha_2} \right)^{\frac{1}{\alpha_1 + \alpha_2}} \right) \quad (2)$$

Here, $\alpha_1, \alpha_2 \geq 0$ represent the stabilization parameters of the Bonferroni function, and k represents the total number of experts. Using the $\tilde{\xi}_{AIP}$ values, the fuzzy relation vector $A = (\tilde{\gamma}_1, \tilde{\gamma}_2, \dots, \tilde{\gamma}_j)$ is obtained as Eq. (3).

$$\tilde{\gamma}_j = \frac{\tilde{\theta}_j}{\tilde{\xi}_{AIP}} = \left(\frac{\theta_j^{(l)}}{\xi_{AIP}^{(l)}}, \frac{\theta_j^{(m)}}{\xi_{AIP}^{(m)}}, \frac{\theta_j^{(u)}}{\xi_{AIP}^{(u)}} \right) \quad (3)$$

This process calculates the fuzzy relation vector $A = (\tilde{\gamma}_1, \tilde{\gamma}_2, \dots, \tilde{\gamma}_j)$

Step 4. Determining the Weighting Coefficient Vectors ($\tilde{w}_j$)

Eq. (4) is used to find the final weighting coefficients of the criteria.



$$\tilde{w}_j = \frac{\ln(\tilde{\gamma}_j)}{\ln(\tilde{b})} = \left(\frac{\ln(\gamma_j^{(l)})}{\ln(b^{(u)})}, \frac{\ln(\gamma_j^{(m)})}{\ln(b^{(m)})}, \frac{\ln(\gamma_j^{(u)})}{\ln(b^{(l)})} \right) \quad (4)$$

Here, the value of $\tilde{b}$ is calculated by multiplying all the calculated $\tilde{\gamma}_j$ elements in Eq. (5).

$$\tilde{b} = \prod_{j=1}^n \tilde{\gamma}_j = \left(\prod_{j=1}^n \gamma_j^{(l)}, \prod_{j=1}^n \gamma_j^{(m)}, \prod_{j=1}^n \gamma_j^{(u)} \right) \quad (5)$$

The resulting weighting coefficients must satisfy the condition $\sum_{j=1}^n w_j = 1$. Finally, the fuzzy values were defuzzified so that the criteria could be ranked as Eq. (6).

$$def(w_j) = \left(w_j^{(l)} + 4 \cdot w_j^{(m)} + w_j^{(u)} \right) / 6 \quad (6)$$

3.4.2. Q-Rung Orthopair Fuzzy Set-based COPRAS Method

In 2017, Yager defined q-ROFS by extending Pythagorean fuzzy numbers (PFS) with intuitionistic fuzzy numbers (IFS). IFS's, PFS's, and q-ROFS methods are advantageous over classical fuzzy sets because they examine membership and non-membership cases together. Furthermore, q-level fuzzy numbers are considered superior to IFS and PFS numbers in modeling uncertainty because they define this relationship with the q -th parameter (Zhu et al., 2022).

In Eq. (7), x represents an element in the universal set, $\mu_A(x)$ indicates the degree to which the element is a member of the set, and $\nu_A(x)$ indicates the degree to which it is not a member. The values of $\mu_A(x)$ and $\nu_A(x)$ must be in the range of 0-1 (Yager, 2017).

$$A = \{x, \mu_A(x), \nu_A(x) | x \in X\} \quad (7)$$

In Eq. (8), the sum of the q degrees of membership and non-membership is 1 or less than 1. This reveals the uncertainty value in Eq. (9). If it is not equal to 1, an uncertainty condition arises (Yager, 2017).

$$(\mu_A(x))^q + (\nu_A(x))^q \leq 1 \quad (8)$$

$$\pi_A(x) = \left(1 - (\mu_A(x))^q - (\nu_A(x))^q \right)^{1/q} \quad (9)$$

q-ROFS, an effective method for modeling uncertain data, offer a much larger uncertainty definition space compared to intuitionistic fuzzy number (IFS) and Pythagorean fuzzy number (PFS) fuzzy sets as the q parameter increases (Zhu et al., 2022).

In this study, the q-ROFS-based COPRAS method was used to rank the alternatives.

Step 1. Selection of experts and determination of their importance weights.

The set of alternatives in the solution space is defined as $X = \{X_1, X_2, \dots, X_n\}$ and the set of criteria is defined as $Z = \{Z_1, Z_2, \dots, Z_n\}$. q-ROFS numbers $M_g = [m_g(a), \gamma_g(a), \tau_g(a)]$ are used to calculate the importance weights of the decision-makers as. Eq. (10) is used to determine the importance weights of the decision-makers.

$$\Omega_g = \frac{1 + m_g^q - \gamma_g^q}{\sum_{g=1}^p (1 + m_g^q - \gamma_g^q)} \quad (10)$$



Table 2 presents the linguistic terms used.

Table 2. Linguistic terms (Pinar, 2022).

Linguistic terms	Abbreviations	η	γ
Extremely high	EH	0.95	0.15
Very high	VH	0.85	0.25
High	H	0.75	0.35
Medium high	MH	0.65	0.45
Medium	M	0.55	0.55
Medium low	ML	0.45	0.65
Low	L	0.35	0.75
Very low	VL	0.25	0.85
Extremely low	EL	0.15	0.95

Step 2. Creating a combined decision matrix and weighting the criteria.

The importance weights of the criteria (φ_j) Eq. (11) is obtained.

$$\varphi_j = \frac{\sum_{g=1}^p \Omega_g (1 + m_{jg}^q - \gamma_{jg}^q)}{\sum_{j=1}^s \sum_{g=1}^p \Omega_g (1 + m_{jg}^q - \gamma_{jg}^q)} \quad (11)$$

Step 3. Weighted decision matrix.

The combined decision matrix is multiplied by the criterion weights in Eq. (12) to obtain the weighted decision matrix.

$$\varphi_g \theta_1 = \left\langle \left(1 - \left(1 - m_{ij}^q \right)^{\varphi_g} \right)^{\frac{1}{q}}, \gamma_{Ai}^{\varphi_g} \right\rangle, \tau_{Ai}(a_j) = \left(1 - m_{Ai}^q(a_j) - \gamma_{Ai}^q(a_j) \right)^{1/q} \quad (12)$$

The elements of the newly obtained matrix are q-ROFS numbers in the format $r'_{ij} = [m_{Ai\varphi}(a_j), \gamma_{Ai\varphi}(a_j), \tau_{Ai\varphi}(a_j)]$.

Step 4. Calculating Maximization and Minimization Indices.

The utility criteria are summed to obtain the P_i values Eq. (13):

$$P_i = \sum_{j=1}^g r'_{ij}^+, \quad i = 1, 2, 3, \dots, z \quad (13)$$

The cost criteria are then summed to form the R_i values Eq (14):

$$R_i = \sum_{j=g+1}^s r'_{ij}^-, \quad i = 1, 2, 3, \dots, z \quad (14)$$

These collected q-ROFS values were defuzzified with the score function in Eq. (15) to convert them into comparable net numbers.

$$S(A) = \frac{1 + m(a)^q - \gamma(a)^q}{2} \quad (15)$$

Step 5. Calculating the relative importance of the alternatives and finally ranking them.

The relative importance (Q_i) of each alternative is formulated by Eq. (16) using the defuzzified benefit and cost indices.



$$Q_i = P_i + \frac{R_{min} \sum_{j=1}^Z R_i}{R_i \sum_{j=1}^Z \frac{R_{min}}{R_i}} \quad (16)$$

Finally, these relative importance values are ratioed to the maximum Q value, and the utility values of the alternatives (N_i) are calculated as percentages via Eq. (17).

$$N_i = \left(\frac{Q_j}{Q_{max}} \right) * 100 \quad (17)$$

They are ranked according to their N_i values (Guliyev et al., 2025).

4. Experimental Results

4.1. Application of the Fuzzy LAAW method

As the first step of the application, the criteria were evaluated by 3 experts of equal importance. The evaluation results are given in Table 3.

Table 3. Expert evaluations.

Type	Criteria List		Expert 1	Expert 2	Expert 3
-	MC ₁	Economic and Regional Development Dimension	H	MH	VH
-	MC ₂	Biodiversity and Natural Capital	VH	VH	H
-	MC ₃	Climate and Environmental Sustainability	VH	H	VH
-	MC ₄	Landscape, Cultural and Social Sustainability	H	VH	H
Benefit	C ₁₁	Regional Economic Value Creation	H	MH	H
Benefit	C ₁₂	Local Employment and Income Generation	H	H	MH
Benefit	C ₁₃	Economic Diversification and Resilience	MH	H	H
Benefit	C ₂₁	Biodiversity Conservation	VH	VH	H
Benefit	C ₂₂	Terrestrial Habitat and Ecosystem Integrity	VH	H	VH
Benefit	C ₂₃	Freshwater Ecosystem and Water Resource Protection	VH	VH	VH
Benefit	C ₃₁	Climate Change Mitigation	H	H	VH
Benefit	C ₃₂	Climate and Disaster Resilience	VH	VH	VH
Cost	C ₃₃	Pollution and Environmental Pressure	H	VH	H
Benefit	C ₄₁	Landscape Integrity	H	H	MH
Benefit	C ₄₂	Cultural Heritage and Traditional Livelihood Preservation	MH	VH	H
Benefit	C ₄₃	Community Well-being and Social Acceptance	H	H	MH

Table 4 presents these converted to fuzzy numbers

Table 4. Blurred expert assessments.



Type	Criteria List		Expert 1	Expert 2	Expert 3
	MC ₁	Economic and Regional Development Dimension	(6,7,8)	(5,6,7)	(7,8,9)
	MC ₂	Biodiversity and Natural Capital	(7,8,9)	(7,8,9)	(6,7,8)
	MC ₃	Climate and Environmental Sustainability	(7,8,9)	(6,7,8)	(7,8,9)
	MC ₄	Landscape, Cultural and Social Sustainability	(6,7,8)	(7,8,9)	(6,7,8)
Benefit	C ₁₁	Regional Economic Value Creation	(6,7,8)	(5,6,7)	(6,7,8)
Benefit	C ₁₂	Local Employment and Income Generation	(6,7,8)	(6,7,8)	(5,6,7)
Benefit	C ₁₃	Economic Diversification and Resilience	(5,6,7)	(6,7,8)	(6,7,8)
Benefit	C ₂₁	Biodiversity Conservation	(7,8,9)	(7,8,9)	(6,7,8)
Benefit	C ₂₂	Terrestrial Habitat and Ecosystem Integrity	(7,8,9)	(6,7,8)	(7,8,9)
Benefit	C ₂₃	Freshwater Ecosystem and Water Resource Protection	(7,8,9)	(7,8,9)	(7,8,9)
Benefit	C ₃₁	Climate Change Mitigation	(6,7,8)	(6,7,8)	(7,8,9)
Benefit	C ₃₂	Climate and Disaster Resilience	(7,8,9)	(7,8,9)	(7,8,9)
Cost	C ₃₃	Pollution and Environmental Pressure	(6,7,8)	(7,8,9)	(6,7,8)
Benefit	C ₄₁	Landscape Integrity	(6,7,8)	(6,7,8)	(5,6,7)
Benefit	C ₄₂	Cultural Heritage and Traditional Livelihood Preservation	(5,6,7)	(7,8,9)	(6,7,8)
Benefit	C ₄₃	Community Well-being and Social Acceptance	(6,7,8)	(6,7,8)	(5,6,7)

The average of the criteria evaluated by three experts was taken and combined. The combined expert scores are given in Table 5.

Table 5. Combined expert assessments

Criteria	L	M	U
MC ₁	6	7	8
MC ₂	6.666667	7.666667	8.666667
MC ₃	6.666667	7.666667	8.666667
MC ₄	6.333333	7.333333	8.333333
C ₁₁	5.666667	6.666667	7.666667
C ₁₂	5.666667	6.666667	7.666667
C ₁₃	5.666667	6.666667	7.666667
C ₂₁	6.666667	7.666667	8.666667
C ₂₂	6.666667	7.666667	8.666667
C ₂₃	7	8	9
C ₃₁	6.333333	7.333333	8.333333
C ₃₂	7	8	9
C ₃₃	6.333333	7.333333	8.333333
C ₄₁	5.666667	6.666667	7.666667
C ₄₂	6	7	8
C ₄₃	5.666667	6.666667	7.666667

The absolute anti-ideal point values were determined as 4.7, 4.8, and 4.9, respectively. The expert evaluations were divided by the ξ_{AIP} values, and the combined relationship vector was calculated in Table 6.



Table 6. Combined relation vector.

Criteria	L	M	U
MC ₁	1.224490	1.458333	1.702128
MC ₂	1.360544	1.597222	1.843972
MC ₃	1.360544	1.597222	1.843972
MC ₄	1.292517	1.527778	1.773050
C ₁₁	1.156463	1.388889	1.631206
C ₁₂	1.156463	1.388889	1.631206
C ₁₃	1.156463	1.388889	1.631206
C ₂₁	1.360544	1.597222	1.843972
C ₂₂	1.360544	1.597222	1.843972
C ₂₃	1.428571	1.666667	1.914894
C ₃₁	1.292517	1.527778	1.773050
C ₃₂	1.428571	1.666667	1.914894
C ₃₃	1.292517	1.527778	1.773050
C ₄₁	1.156463	1.388889	1.631206
C ₄₂	1.224490	1.458333	1.702128
C ₄₃	1.156463	1.388889	1.631206

The final weighting coefficients for the criteria have been calculated and are presented in Table 7.

Table 7. Final weighting coefficients.

Criteria	L	M	U	Def local	L	M	U	Def global
MC ₁	0.086979	0.21713	0.494824	0.041828				
MC ₂	0.132229	0.269484	0.56929	0.05132				
MC ₃	0.132229	0.269484	0.56929	0.05132				
MC ₄	0.1102	0.243902	0.532802	0.046681				
C ₁₁	0.099026	0.333333	1.122041	0.073669	0.008613	0.072377	0.555213	0.087401
C ₁₂	0.099026	0.333333	1.122041	0.073669	0.008613	0.072377	0.555213	0.087401
C ₁₃	0.099026	0.333333	1.122041	0.073669	0.008613	0.072377	0.555213	0.087401
C ₂₁	0.164336	0.323532	0.629261	0.06021	0.02173	0.087187	0.358232	0.074637
C ₂₂	0.164336	0.323532	0.629261	0.06021	0.02173	0.087187	0.358232	0.074637
C ₂₃	0.190378	0.352937	0.668071	0.065473	0.025174	0.095111	0.380326	0.080499
C ₃₁	0.142943	0.311983	0.658385	0.059101	0.018901	0.084074	0.374812	0.07477
C ₃₂	0.198698	0.376035	0.74686	0.07065	0.026274	0.101335	0.42518	0.087756
C ₃₃	0.142943	0.311983	0.658385	0.059101	0.018901	0.084074	0.374812	0.07477
C ₄₁	0.096236	0.317609	0.992019	0.068025	0.010605	0.077466	0.52855	0.086959
C ₄₂	0.134076	0.364781	1.078302	0.077047	0.014775	0.088971	0.574522	0.096809
C ₄₃	0.096236	0.317609	0.992019	0.068025	0.010605	0.077466	0.52855	0.086959

The weights of the last 12 criteria are provided in Table 8.

Table 8. Weights of the criteria.

Type	Criteria	Weight
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Benefit	C ₁₁	0.087401
Benefit	C ₁₂	0.087401
Benefit	C ₁₃	0.087401
Benefit	C ₂₁	0.074637
Benefit	C ₂₂	0.074637
Benefit	C ₂₃	0.080499
Benefit	C ₃₁	0.074770
Benefit	C ₃₂	0.087756
Cost	C ₃₃	0.074770
Benefit	C ₄₁	0.086959
Benefit	C ₄₂	0.096809
Benefit	C ₄₃	0.086959

4.2. Application of the q-ROFS Based COPRAS Method

The experts' alternative assessments are reported in Table 9.

Table 9. Evaluation of alternatives.

Exper t 1	Alternative List	C ₁₁	C ₁	C ₁₃	C ₂	C ₂	C ₂	C ₃₁	C ₃₂	C ₃₃	C ₄	C ₄₂	C ₄₃
			2		1	2	3				1		
A ₁	Conventional Growth-Oriented Development	VH	V	H	L	L	V	M	L	EH	L	M	M
A ₂	Green Economic Transformation	H	H	VH	H	H	H	VH	H	M	H	H	H
A ₃	Nature-Based Regional Development	M	H	H	E	E	E	H	H	VL	E	EH	V
A ₄	Integrated Climate-Resilient Development	VH	V	EH	V	V	V	EH	EH	L	V	V	EH
			H		H	H	H				H	H	

Exper t 2	Alternative List	C ₁₁	C ₁	C ₁₃	C ₂	C ₂	C ₂	C ₃₁	C ₃₂	C ₃₃	C ₄	C ₄₂	C ₄₃
		1	2		1	2	3				1		
A ₁	Conventional Growth-Oriented Development	EH	V	H	V	L	L	M	M	EH	V	L	M
A ₂	Green Economic Transformation	VH	H	VH	H	V	H	EH	V	M	H	H	V
A ₃	Nature-Based Regional Development	M	V	H	E	E	V	M	V	VL	E	EH	EH
A ₄	Integrated Climate-Resilient Development	VH	E	EH	V	E	E	VH	EH	L	V	V	EH
			H		H	H	H				H	H	

Exper t 3	Alternative List	C ₁₁	C ₁	C ₁₃	C ₂	C ₂	C ₂	C ₃₁	C ₃₂	C ₃₃	C ₄	C ₄₂	C ₄₃
			2		1	2	3				1		
A ₁	Conventional Growth-Oriented Development	VH	H	M	L	V	V	M	L	V	L	M	M
A ₂	Green Economic Transformation	H	V	H	V	H	V	VH	H	L	H	V	H
A ₃	Nature-Based Regional Development	M	H	VH	E	V	E	H	V	EL	E	EH	V
A ₄	Integrated Climate-Resilient Development	EH	V	VH	V	E	V	EH	EH	VL	V	EH	EH
			H		H	H	H				H		

The q parameter was determined as in Eq. (3). The combined decision matrix is given in Table 10.



Table 10. Combined decision matrix.

Criteria	A ₁ η	A ₁ γ	A ₂ η	A ₂ γ	A ₃ η	A ₃ γ	A ₄ η	A ₄ γ
C ₁₁	0.897555	0.210858	0.790919	0.312866	0.588815	0.514414	0.897555	0.210858
C ₁₂	0.8235	0.279672	0.790919	0.312866	0.790919	0.312866	0.897555	0.210858
C ₁₃	0.722055	0.380583	0.8235	0.279672	0.790919	0.312866	0.928806	0.177845
C ₂₁	0.323569	0.781953	0.790919	0.312866	0.95	0.15	0.85	0.25
C ₂₂	0.323569	0.781953	0.790919	0.312866	0.928806	0.177845	0.928806	0.177845
C ₂₃	0.291594	0.815267	0.790919	0.312866	0.928806	0.177845	0.897555	0.210858
C ₃₁	0.489006	0.614794	0.897555	0.210858	0.722055	0.380583	0.928806	0.177845
C ₃₂	0.389819	0.715065	0.790919	0.312866	0.8235	0.279672	0.95	0.15
C ₃₃	0.928806	0.177845	0.422312	0.681757	0.2261	0.882105	0.323569	0.781953
C ₄₁	0.323569	0.781953	0.75	0.35	0.95	0.15	0.85	0.25
C ₄₂	0.422312	0.681757	0.790919	0.312866	0.95	0.15	0.897555	0.210858
C ₄₃	0.521723	0.581495	0.790919	0.312866	0.897555	0.210858	0.95	0.15

The weighted decision matrix is presented in Table 11.

Table 11. Weighted decision matrix.

Criteria	A ₁ η	A ₁ γ	A ₂ η	A ₂ γ	A ₃ η	A ₃ γ	A ₄ η	A ₄ γ
C ₁₁	0.473494	0.872803	0.386922	0.903429	0.270347	0.943558	0.473494	0.872803
C ₁₂	0.41007	0.894616	0.386922	0.903429	0.386922	0.903429	0.473494	0.872803
C ₁₃	0.34325	0.919033	0.41007	0.894616	0.386922	0.903429	0.508781	0.85991
C ₂₁	0.136957	0.98181	0.367615	0.916928	0.513357	0.867972	0.409374	0.901704
C ₂₂	0.136957	0.98181	0.367615	0.916928	0.484325	0.879074	0.484325	0.879074
C ₂₃	0.126389	0.983693	0.376749	0.910703	0.495919	0.87022	0.461355	0.88223
C ₃₁	0.209954	0.96428	0.450683	0.890133	0.326169	0.930315	0.484595	0.878872
C ₃₂	0.174836	0.970997	0.387429	0.903056	0.410604	0.894211	0.539585	0.846637
C ₃₃	0.484595	0.878872	0.18006	0.971763	0.095423	0.990664	0.137039	0.981778
C ₄₁	0.144104	0.978839	0.359683	0.912752	0.538081	0.847918	0.429934	0.886432
C ₄₂	0.196195	0.963593	0.39991	0.893606	0.555948	0.83222	0.488941	0.860114
C ₄₃	0.236516	0.953949	0.386287	0.903893	0.472738	0.873403	0.538081	0.847918

Table 12 reports the calculated maximization and minimization indices. The relative importance levels and final ranking values are given in Table 13.

Table 12. Max-Min index.

Alternative	P_i	R_i
A ₁	0.873240329	0.21747217

A ₂	1.75668224	0.044089331
A ₃	2.18209237	0.014307485
A ₄	2.477265901	0.028125353

Table 13. Relative importance levels and final ranking.

Alternative	Q_i	N_i	Rank
A ₁	0.88377204	34.53988936	4
A ₂	1.80863027	70.68552365	3
A ₃	2.342173186	91.53763535	2
A ₄	2.558699684	100	1

4.3. Comparative Analysis

The q-ROFS-based COPRAS method was compared with the q-ROFS-based WASPAS and q-ROFS-based TOPSIS methods. A comparison table is presented in Table 14. The ranking of the alternatives in all methods was found to be A₄, A₃, A₂, and A₁.

Table 14. Comparative analysis.

Alternatives/Methods	q-ROF COPRAS		q-ROF WASPAS		q-ROF TOPSIS	
	N_i	Rank	CC	Rank	WASPAS Score	Rank
A ₁	34.53989	4	0.167048651	4	0.10093465	4
A ₂	70.68552	3	0.609882471	3	0.46123916	3
A ₃	91.53764	2	0.737378153	2	0.57266237	2
A ₄	100	1	0.844240689	1	0.71104371	1

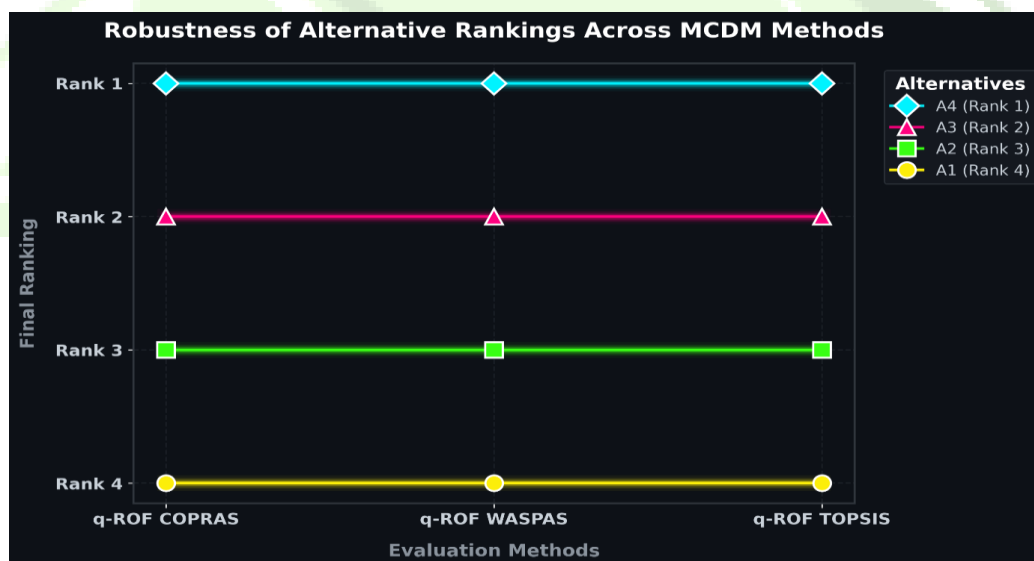


Figure 1. Robustness of alternative rankings.

When the methods are compared, the change in ranking for all methods is shown in Figure 1.

5. Discussion



The findings of this study highlight the advantages of the proposed q-ROFS-based method in addressing complex decision-making problems under uncertainty. As a generalization of IFS and PFS, q-ROFSs provide a flexible structure for representing uncertainty by simultaneously considering membership and non-membership degrees. The Fuzzy LAAW method, employed for criterion weighting, is particularly advantageous in problems involving a large number of criteria, as it requires relatively few comparisons. In addition, its fuzzy structure enables variations in expert judgments to be represented more effectively.

A comparative analysis was conducted to assess the stability of the proposed method based on the alternative rankings obtained using the q-ROFS-based COPRAS method. The q-ROFS-based WASPAS and q-ROFS-based TOPSIS methods were employed for comparison. The identical rankings obtained across these methods supported the stability and robustness of the proposed approach.

The ranking of the alternatives was obtained as $A_4 > A_3 > A_2 > A_1$. Accordingly, Integrated Climate-Resilient Development (A_4) was identified as the most effective sustainable development strategy for the Eastern Black Sea Region of Türkiye.

6. Conclusion

This study aimed to identify the most suitable sustainable development pathway for the Eastern Black Sea Region of Türkiye. The alternatives were defined as conventional growth-oriented development, green economic transformation, nature-based regional development, and integrated climate-resilient development. The Fuzzy LAAW method was employed to determine the criterion weights due to its relatively simple structure and limited comparison requirements. To account for uncertainty in expert evaluations, q-ROFS were integrated with the COPRAS method to rank the alternatives.

First, four main criteria and twelve sub-criteria identified through a literature review were evaluated by three experts. The ranking obtained using the q-ROFS-based COPRAS method was $A_4 > A_3 > A_2 > A_1$. Accordingly, integrated climate-resilient development was identified as the most suitable sustainable development strategy among the considered alternatives.

The results were further compared with those obtained using q-ROFS-based WASPAS and q-ROFS-based TOPSIS, and the same ranking was observed across all methods. Future studies may address the same decision problem using different fuzzy set extensions and MCDM methods to examine the consistency of the results. In addition, the proposed framework may be applied to other regions to evaluate its broader applicability.

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Development of Sacred Site Tourism of the Lepchas: A Case Study of the Damsang Fort, Kalimpong, Darjeeling Himalaya

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Abstract. Faith-based sacred site tourism has developed cultural and spiritual elements across the Himalayan region. Indigenous Lepchas of the Eastern Himalayas are referred to as *Rongkup* or *Rumkup*, meaning “children of God,” distributed mainly across Sikkim, the northern part of West Bengal, Nepal, and Bhutan. They have many holy or sacred places scattered over the *Mayel Lyang*, referred to as the vast land of the Lepchas. They consider themselves the ‘children of the snowy peaks’ of Mt. Khangchendzonga and also possess oral narratives of faith and belief systems. Some events made a place historically important and culturally significant. Such a sacred place to the Lepchas is Damsang Fort, often termed Damsang Gadi/Gree. In honour of the Lepcha King and Leader, Gaeboo Achyok, the Lepcha community of Kalimpong, Darjeeling Himalaya, has developed a faith-based sacred and historical site. Arguably, the classification of sacred site tourism needs an ontological understanding. However, the study explores the reasons for the potential development of Damsang Fort as a sacred tourism site. It also addresses the motivational and faith perspectives as drivers for the Lepchas behind celebrating the sacred site each year. This qualitative purposive study employed researchers’ field observation, oral traditions of the community, photo-taking, conducting interviews with local Lepchas, and consulting cultural expertise from the community. The findings suggest the need for contextualisation of the characteristics of the host destination (Damsang) and the tourist-generating region (global). The study also refers to the understanding of the place’s historical, cultural, and spiritual significance, which determines the potentiality of the development of this place as a sacred tourism site.

Keywords: Sacred Site Tourism, The Lepchas, Damsang Fort, Kalimpong, Darjeeling Himalaya

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1. Introduction

The term sacred site constitutes a different perspective, considering different beliefs curated through practices and rituals associated with different cultural, social, and religious groups. However, indigenous sacred sites might not appear the same. A place termed as sacred and faith site can mean as spiritually alive, culturally essential, or a simple natural land deserve respect. In today’s secular world, the relationship between tourists and their beliefs plays a major role in influencing individuals’ pilgrimages to sacred sites (Raj. R, 2023). To the Western world, perhaps sacred is synonymous with sacrosanct, considered holy, but to indigenous communities, a place sacred means historically, culturally, or spiritually important. (<https://sacredland.org/>). In ancient religions like Hinduism, a temple, or in world religions like Christianity and Islam, a Church or Mosque can be a representation of sacred sites. But in the view of the Tribal community, the mountain, lake, forest, river, or a historical place of respect can be a site of sacredness. Sacred landscapes, a concept explored extensively in anthropological and religious studies, refer to those physical spaces that communities imbue with spiritual meaning, serving as arenas where cosmology, ritual,



and ecological knowledge converge (Basso, 1996; Feld & Basso, 1999). India's religious tourism has deep historical roots, cultural diversity, and spiritual notions. The sites evolved as educational, cultural, and devotion-based, based on religious acceptance (Cevallos, 2016). It is faster-paced and encourages the performance of devotion and identity (<https://www.holyland360.tours/>), for example, offering garlands and lighting candles. Whereas sacred site tourism differs from the regular notion of religious tourism. It holds that certain places are not only important from a historical perspective but carry a wide range of memories, stories, sufferings, devotion, and hope that continue to shape a region's people. In the Himalayan region, apart from visiting sacred buildings of worship, indigenous communities, being nature-centric, are drawn towards worshipping high mountain sites as places of worship (Gawlik et al., 2022). In the Eastern Himalayas, indigenous communities such as the Lepchas, who are spread over Sikkim, Darjeeling, Nepal, and Bhutan, have many sacred sites of worship, as they consider themselves *Rongkup*, meaning 'sons of the snowy peaks'. Damsang Fort/ Gree / Gadi marks the faith of the Lepchas of Kalimpong specifically, as the dispersion of Lepchas is across borders and, in this region, it happened from Sikkim to Pedong, Kalimpong, mainly due to political shifts. The Damsang Fort carries historical evidence to date. The Lepchas pay respect to their King Leader, Gaeboo Achyok, who built this fort, and the Lepchas have marked this place as a Sacred Faith Site of the Kalimpong region, Darjeeling Himalayas.

The study is an attempt to make aware of the indigenous Lepchas' sacred site for the development of the place from the sacred tourism aspect to promote the Indigenous Lepcha oral traditions and history as one of the oldest in the Eastern Himalaya. It also describes the sacred site from an indigenous belief system, as in India it's mostly an Eastern religious belief system based on sacred buildings and architecture. The study also attempts the appraisal of Damsang Fort, a potential place for sacred tourism with an environmentally conscious approach.

2. Literature Review

From the work of Gorer (1938) and Awasthy (1999) it is known that Lepcha beliefs are influenced by Lamaistic Buddhism and Christianity. They also practice "*Mun-bongthingism*," which is kind of similar to Zoroastrian monotheism. So, they have places of religious importance that are forms of religious tourism. However, King Pano Gaeboo Achyok, the Lepcha cultural hero who resisted and safeguarded the Lepcha community from Bhutanese aggression, recurrent political turmoil, and existential crisis, holds tremendous faith and is worshipped by the Lepchas of Kalimpong particularly, since the 17th century (Aris, 1979; Roy et al. al, 1998; Ardussi, 2011). Hence, the development of Damsang Fort as a potential Sacred Faith Site and a place for sacred tourism, along with a heritage site, holds importance to the Lepcha community across regions.

Gaeboo Achyok or Gyalpo Ajok, a Lepcha chieftain of Damsang, Kalimpong, faced threats from Bhutan as Bhutanese Lamas began to exert pressure on the Lepchas of this region, which was aided by their regional fortress, Daling, Kalimpong (Ardussi, 2014). Bhutanese people and their culture remained a common thread between Lepchas of Sikkim and Kalimpong, and they attacked both the territory and the Lepcha ruler *Pano Gayboo Achyok* at his Dalim fort in Kalimpong; after repeated attacks, the Bhutanese managed to take it over again in 1710 (Mandal, 2018). With the intervention of the Dalai Lama, Bhutan left Sikkim, but *Damsang Lyang* and Kalimpong were under them. As Achyok formed an alliance with Tibet, several wars occurred until he was captured at Daling and executed. To celebrate Achyok, his birthday-allegedly on 20th December is commemorated by the Lepchas of Kalimpong, Darjeeling and nearby Sikkim (Dhukpa, 2020). Even after the West Bengal Government's enlistment of Damsang Fort as a Heritage Site (2018), the faith of the Lepchas in the King makes it a place of sacred importance and is acknowledged by the Lepcha people as their sacred site.

3. Research gap

Irrespective of being one of the oldest inhabitants of the Eastern Himalayas and having nature-centric religious practices, the Lepchas' oral traditional knowledge system (TKS) is not recognised as it should be. Their faith-based practices over sacred heritage sites can make them sacred tourist sites for global tourists across the Kalimpong-Darjeeling Himalaya. Thus, the study asks: To what extent can Damsang Fort- a Lepcha heritage place can be considered and developed as a sacred tourist site while maintaining indigenous Lepchas' cultural identity and environmental consciousness?

4. Study Area

Damsang Fort is situated at an elevation of 1920m and at a distance of 7km from Pedong on the Kalimpong-Rishi Road. It is a place of strategic importance situated in the Sillery Gaon area of Pedong, a Lepcha area in Kalimpong, Darjeeling Himalaya (Fig.1). It is 16km away from the main Kalimpong city and was used as a bridleway earlier. It is maintained by the Lepcha local village organisation, *Sheezoom*, and is historically holy and sacred for the Lepchas of Kalimpong particularly and across other Lepcha regions (Roy, 2011). Most of the Lepchas believe that Damsang was the main and the only palace of Gaeboo Achyok. Kalimpong in earlier days was known as Damsang, which was an independent country ruled by Pano Gaeboo Achyok and his forefathers (Foning, 1987). After his death, it was annexed by Bhutan until 1865 and later annexed by the British.

DAMSANG FORT

- A SACRED SITE OF THE LEPCHAS OF KALIMPONG, DARJEELING HIMALAYA

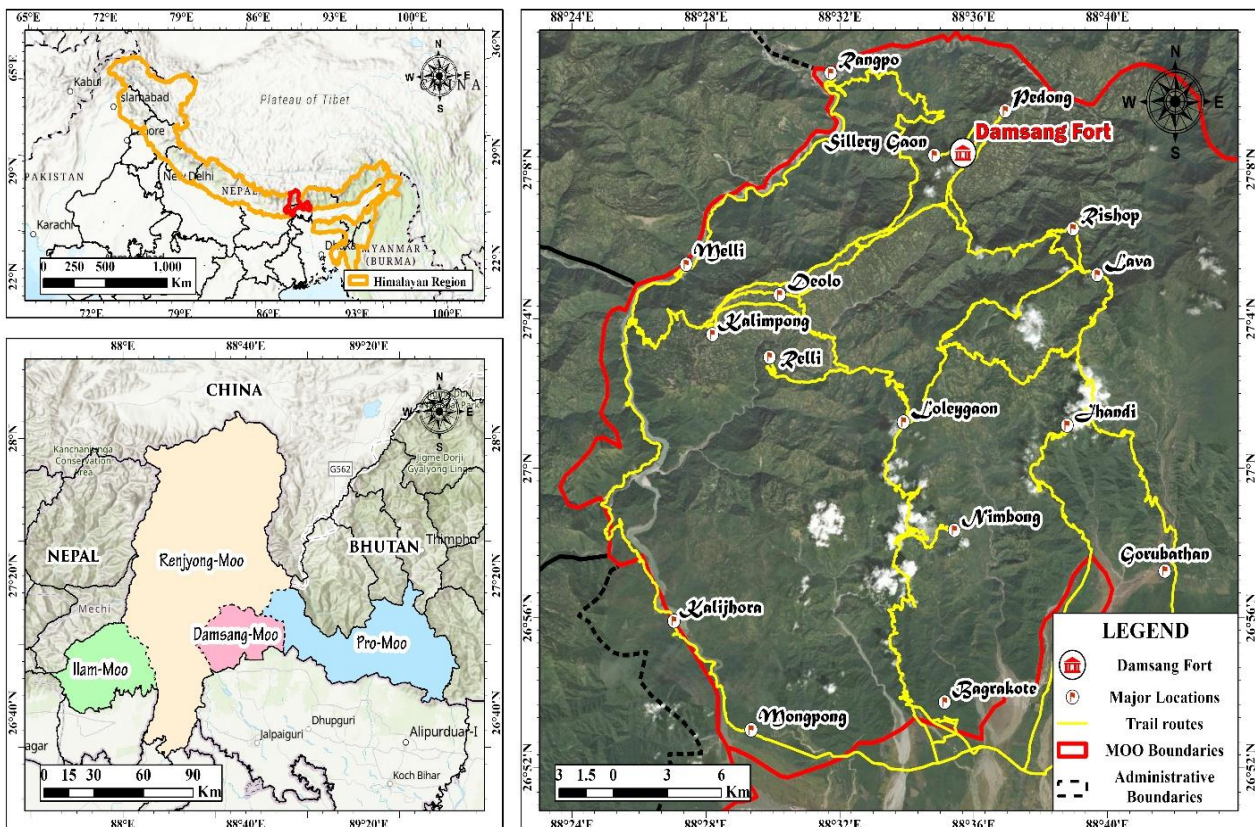


Figure.1. Location of the study area. Information sources: Open Street Map, Survey of India, Google Earth Pro and Roy, D.C. (2011)



5. Materials & Methods

The study was conducted in March and June 2026 and was purposive in nature. The information was collected using unstructured questionnaires by meeting local Lepcha villagers and recording information from the cultural experts of the community, such as O. Tshering Lepcha (Bongthing), Indigenous Lepcha Tribal Association President, and Mr. Dorji. Informal interviews are also conducted among the Lepchas of the Kalimpong main city region, homestay owners of the Sillery gaon and Damsang Gadi/Gree regions, and young Lepchas of the Lepcha villages who are an integral part in treasuring this sacred site by celebrating their Leader King and protecting Lepcha indigenous culture.

The study is based on field observations, oral traditions, and a pertinent literature review. Ethnographic observations audio recordings' transcription verbatim are used to unravel the complex interplay between eco-centric rituals, faith, and celebrating age-old history. It synthesizes qualitative evidence on the aspect of development of Damsang Fort as a sacred tourism site in Kalimpong, Darjeeling Himalaya in terms of heritage, location, and the Lepchas various ways of safeguarding cultural identity. It also proposes some recommendations for the development of the sacred site as a sacred tourist place from indigenous conservation and sustainable perspectives in the Darjeeling Himalaya.

6. Findings and Discussion

6.1. Damsang Fort as a faith-based Sacred Site

In the Eastern Himalayas, most of the Lepcha sacred places are related to Lepcha mythology, while few have historical origins. Most legendary sacred places are located in and around Sikkim, like Dzaongoo, Khecheopalri Lake, Tendong Hill, etc. But there are places where treaties were signed, and battles were fought. Those Lepcha historical places are considered sacred sites, like Kabi Longtsok in Sikkim. In Kalimpong, such a place is Damsang-Daling, dedicated to the last Lepcha king and leader Pano Gaebook Achyok. Damsang region has multiple connotations from a historical perspective that need further evidence-based studies. But researchers unanimously agreed on the Damsang Fort's presence, as Achyok's land was Pano of the Damsang area. Daling was another fort built to protect Lepcha people from invaders, and where Gaeboo Achyok lost his life during the Bhutan war in 1676, irrespective of the 1669 treaty. Bhutan's southwest border fortress Daling, as well as the entire Damsang area, were under the realm of the Bhutanese (Roy, 2014). Relics of Damsang fort are still present, and it's a reminder to the Lepcha community of the Eastern Himalayas of their very existential fight in their own land. One can find rooms for the royals, the horse stable, the mouth of the spring, room for royal guards. The natural dry state of the spring is believed to have been used by the queen. Using simple technology and Lepcha nature-centric knowledge, the fort was built with mud and rocks, which can be seen today. The location at a higher altitude of the fort was favorable then to resist frequent attacks from foreigners. As a tradition to date, symbolic bows, arrows, and stones are kept at the ruined fort site, as these were earlier weapons (Figure 2) used by the Lepchas during attacks. The remnants are a representation of Lepcha architecture, history, tradition, culture in the Darjeeling Himalaya (Tamsang, 1983).



Figure 2. a) Damsang fort marked as a heritage site by the Govt. of West Bengal, b) Prayers offered at the ruined site, c) Dried-up source of the spring, d) Stacked stones as relics, e) Bow and arrow as a symbol of weapons. Source: Author(s).

6.2. Faith-based traditions and rituals of the sacred site

Chi Faat

The celebration starts early in the morning with a 2-hour trail through the woods that is taken to reach the top of the ruined fort. Communities gather there wearing traditional attire: for men, *Dumpra* and for women, *Dumdyam*. The ritual is performed by the Lepcha male priest *Bongthing* and female priest *Mun* as part of the Mun-Bongthism religion. They offer the traditional drink *Chi* in the name of the soul of Gaeboo Achyok, the leader, last king, and Pundee Nalimit, the queen. Traditional drink *Chi* (Fig.3.a), made with fermented millet, is offered as part of a custom which is considered a sacred offering for the Lepchas on every important occasion. As Lepcha traditions are eco-centric, it includes local millets, rice, and utensils, containers made of bamboo, clay, and banana leaves. Mainly on this occasion, *Bongthing* performs the ritual atop a hill.

Communal Prayers

The Lepchas have unique ways to offer communal prayers. Men and Women stand opposite each other in groups. The tales of the bravery and the king's assassination are narrated to the community. The *mun* and *bongthing*, wearing their white dresses, express their gratitude towards the king for saving the community from repeated foreign attacks. *Bongthing P.T. Lepcha*, *Bongthing O.T. Lepcha* (Figure 3.b), and *Bongthing Gaeboo Lepcha* are some of the prominent Lepcha priestesses and priests who perform the role of offerings (Roy,2011). Lepcha traditional rituals and customs are orally transferred, which are not documented properly and are a major hindrance to their cultural preservation and acceptance by the greater world.



Figure.3. a) The offerings mainly Chi, b) Interview with O. Tshering Lepcha, Lepcha cultural expert, and Bongthing, Maney Gumpa, Kalimpong, May 2026. Source: Author(s).

Ethnic gatherings of the Lepchas

It is known from local residents and claimed by cultural experts that the birthday celebration of the King is the largest Lepcha gathering each year where Lepchas from Nepal, Bhutan, Sikkim, and Darjeeling Himalaya assemble. After the invocations and prayers, the day is marked by a typical Lepcha ethnic cultural celebration in Kalimpong. It's an initiative by the Indigenous Lepcha Tribal Association (ILTA) along with other people. A bilingual Lepcha magazine in the name of the Lepcha supreme leader is also published each year to follow his legacy. Damsang is considered as holy, sacred place for the Lepchas like Hindu, Islam communities consider Varanasi and Mecca sacred places. From the scattered historical evidence, limited research articles, and folklore, the bravery tales of Gaeboo Achyuk's contribution to the fight against foreigners for the Lepcha land of the Kalimpong region are known to the people. All Lepchas, irrespective of their age, sex, and place of residence, eagerly await throughout the year to pay a visit to Damsang and get blessings from the divine soul of Pano Gaeboo Achyuk, the saviour of the community (Roy, 2005). Though there are several claims of the presence of other forts made by Achyuk (Tamsang, 2005) still need further clarification. Lepchas of Kalimpong identified themselves as Damsang-moo (clans), i.e., inhabitants of Damsang. As per the name of the fort and the region, the Lepchas residing in this region even today are known as Damsang Moo (Table 1). The other Moos or clans are named as per the areas of Lepcha inhabitants. Where Sikkim, Darjeeling, Kurseong, and Siliguri Lepchas fall under the same moo/ clan, concurrently cross-border Lepchas are termed as Ilam Moo for Nepal and Promu for Bhutan.

Table 1. Lepcha Moo's classification as per the area of Lepcha residence. Source: Modified after Roy, D.C. (2011).

Name of the Moo	Area of residence	Country
Damsang-Moo	Kalimpong	India
Renjyong Moo	Sikkim, Darjeeling, Kurseong, Siliguri	India
Ilam Moo	Ilam	Nepal
Pro Moo/ Promu	Samtse, Chukha	Bhutan

6.3. Indigenous conservation and sustainable sacred tourism

Over the years, the Himalayas have gradually developed into a massive tourism hub and place of attractions for serene landscapes and spiritual sanctuaries as well as adventure opportunities (Kumar, 2024). Indian secular pilgrimage tourism and sacred site tourism are widely spread across Himalayan states like Uttarakhand and Himachal Pradesh. In these regions, community-led indigenous tourism is popularized from spiritual and sustainability perspectives. Environmental education was rendered through oral

traditions and traditional knowledge on biodiversity alongside man's role in its conservation (Singh, 2026). Moreover, in a resource-rich environment, indigenous people's knowledge of their habitat encourages scientific innovations that can be useful for the wellbeing of the community from humanity ground (Pandey, 1998). Damsang fort is not only bears the history and heritage of indigenous Lepchas, but initiation from the community has made this place a holy, sacred site for the Lepchas across borders. The presence of this sacred site reflects a relationship of outward and inward journeys of one's humility, responsibility, and experience. It also differs from religious tourism in certain aspects, like supporting locals instead of extracting from them. The major aspect of this site is to hold space for grief, respect, and listening to the perspectives of the community's existence in oral forms, engaging the entire Lepcha society. Lepchas worship Achyok as the God, the king, and the saviour. In Mun's (Lepcha female priest) temple, in museums, in magazines, in literary works, in general places, Achyok is worshipped each day by the Lepchas (Fig.4). Thus, it remains a place of sacredness, not only as Heritage. Conservation efforts are taken by the government as a heritage place. But it's the Lepcha community's effort, the Indigenous Lepcha Tribal Association (ILTA), Mayel Lyang Lepcha Development Board, to give this place the honour of faith and respect towards their Leader King through various initiatives. Thus, this place deserves further recognition. Not only as an indigenous heritage conservation place but also as a well-acclaimed sacred place for the Lepchas across the globe. As the Lepchas are worshippers of natural elements, in this sacred place their rituals are also performed, including local available resources to celebrate the special occasion. Their environmental education of respecting the forest (trail to reach mountain top), honouring spring water, and performing rituals without destroying natural objects reflects a sustainable perspective for the development of tourism.



Figure.4. a) Gaeboo Achyok worshipped by Lepcha Mun (female priest), b) Magazine published in the name of King Achyok, c) Information is displayed at the Lepcha Museum, Bongbusty, Kalimpong, Darjeeling Himalaya. Source: Author(s)

7. Conclusion

The study is an attempt to draw attention across regions to show a sacred, faith-based place of indigenous communities like Lepchas, amidst thick alpine woods. It not only documented the indigenous belief system, but also highlighted the prospects of developing this place, Damsang Fort, as a Sacred Site for the Lepchas, along with sustainable sacred-faith-based tourism. The ruins of Damsang Fort stand as a testament to indigenous rights to live and protect their homelands. However, broader academic engagement is needed to reimagine this place as a Sacred Site and also from a tourism perspective. Lepcha folk tales and limited historical oral narratives claim that Damsang was constructed by the Lepcha king Gaeboo Achyok; but the Europeans' narratives have different versions of Bhutanese origin. The absence of scientific study is creating many more anomalies in constructing evidence-based documentation in Lepcha/ Rong Language. The study suggests an archaeological survey across this region to formulate Lepcha indigenous knowledge. Both the characteristics of Damsang (host region) and the tourist-generating region(globe) need to be studied through historical, archaeological evidence and economic growth and impact studies. However, for



remote Lepcha villagers, development of Damsang as a Sacred Faith-Based Tourism site with respect and honouring Lepcha culture can be beneficial from an economic point of view. It can be two-dimensional, safeguarding and acknowledging Indigenous Lepcha culture along with uplifting their economic situation.

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Ethnobotanical Knowledge and the Value Chain in the Mountainous Community of Guba

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Abstract. For the Lezgin community living in Azerbaijan's Quba district, the gathering of wild plants not only represents a system of traditional ethnobotanical knowledge but also serves as a primary or supplementary source of livelihood for some households. However, the joint documentation of ethnobotanical knowledge and measures of economic value has not been sufficiently studied. The aim of this study is to document plant-gathering knowledge, the social division of labor in this activity, raw material sales models, and the contribution of the generated income to family livelihoods within the Lezgin community of Quba, based on the FAO/CIFOR value chain framework. The research was conducted in the form of semi-structured interviews in the villages of Küsnət, Küpçal, Qımılqışlaq, and Qəçrəş in the Quba district. Sixteen people participated in the interviews, including 7 women, 4 men, and 5 schoolchildren. As a result, 23 plant species belonging to 13 families were recorded. Surveys have revealed that the labor involved in plant gathering varies according to the zone. Thus, we noted that plants growing at high altitudes are gathered primarily by men, those in the middle and lower zones by women, and that children assist in both zones. The sale of the products is carried out primarily by men and children at the roadside, and by women at local markets. Although it was not possible to collect quantitative data on income due to the confidentiality of financial information, it was determined that the sale of seasonal wild plants serves as a primary source of livelihood for some households.

Keywords: *ethnobotanical knowledge, wild edible plants, value chain, Quba Lezgin community, diversification of livelihood strategies*

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1. Introduction

Mountain and foothill ecosystems not only constitute a significant part of global biodiversity but also rank among the areas with the richest repositories of traditional ecological knowledge (Manzoor et al., 2023). Located on the southeastern slopes of the Greater Caucasus, the Quba district is one of Azerbaijan's administrative units distinguished by its ethnic diversity. Alongside Azerbaijanis, Lezgins, Tats, Mountain Jews, Khinalugs, Kryts, and other ethnic groups live in the district (Quba Rayon İcra Hakimiyyəti, n.d.). The rich system of traditional knowledge formed within a mountainous terrain is considered a treasure of local ethnic communities. Ethnic communities living in these areas, including the Lezgin community, have shaped their food, health, and livelihood strategies based on plant-related knowledge passed down from generation to generation (İbadullayeva & Şahmuradova, 2015).

The growth of wild edible and medicinal plants in the area under natural conditions is attributed to their rich content of microelements, organic acids, and vitamins (Casas et al., 2024). Wild forms, considered more beneficial than cultivated varieties, are also highly valuable as medicinal and functional foods (Casas et al., 2024; Qəhrəmanova & İbadullayeva, 2017; Turner, 2011). The economic significance of wild plant



resources—specifically how they are harvested and sold at the community level, and how the resulting income contributes to livelihoods—has yet to receive adequate research attention.

The value chain framework developed by FAO and CIFOR enables a systematic analysis of the journey of non-timber forest products (NTFPs) from raw material to market—covering the stages of harvesting, processing, transportation, and sales (Dong et al., nd). Combining this framework with traditional ethnobotanical methods (usage, harvesting knowledge, and plant identification) makes it possible to create a comprehensive picture at the community level that simultaneously reflects both cultural and economic dimensions

The aim of this study is to gather ethnobotanical knowledge regarding the gathering, use, and sale of wild plants among the Lezgin community in the villages of Küsnət, Küpçal, Qımılqışlaq, and Qəcrəş in the Quba district, and to assess the contribution of this knowledge to community livelihoods through the lens of the value chain. The community's recognition and use of wild flora, the division of labor regarding harvesting and sales within the community, and the impact of these activities on livelihood strategies constitute the primary focus of the research.

2. Materials and methods

2.1. Study area

The Lezgin community of the Quba district—located on the southeastern foothills of the Greater Caucasus and spanning an area that extends from the lower foothills to the mid-to-high mountain zones—was selected as the study area. The research was conducted from June 1 to 5, 2026, in the villages of Küsnət, Küpçal, Qımılqışlaq, and Qəcrəş, which are inhabited by the Lezgin community.

2.2. Inquiries and data collection

In the study, individuals possessing ethnobotanical knowledge were identified using purposive sampling, and data were collected through semi-structured interviews (Casas et al., 2024; Martin, 1995). Sixteen participants took part in the surveys. Among them were 7 women, 4 men, and 5 schoolchildren. School-aged children around 14 or 15 years old sell seasonal plants by the roadside. Interviews with students were conducted with the direct participation of their parents, ensuring both compliance with ethical requirements and the reliability of the collected data.

2.3. Plant material and taxonomic identification

Due to the fact that the survey period did not coincide with the harvesting season for certain species, plant material was not collected directly in the field; instead, dried specimens prepared and stored using traditional methods by the knowledge holders were utilized. Taxonomic identification at the species level was carried out jointly by the researcher and the scientific supervisor, and scientific names were verified against the World Flora Online (WFO) and Plants of the World Online (POWO) databases (WFO, 2026; POWO)

2.4. Analytical framework

The collected data were classified according to the FAO/CIFOR value chain methodology: (i) harvesting knowledge and division of labor, (ii) raw material sales model, and (iii) contribution of income to livelihoods. As one of the study's limitations, due to the sensitivity of financial information, precise quantitative income figures could not be collected; therefore, this measure relied on the participants' subjective quality assessments.



3. Results

Within the scope of the study, 23 wild plant species belonging to 13 families were recorded (Table 1). As shown in the table, the Rosaceae Juss. family predominated with 7 species. The families Apiaceae Lindl., Fagaceae Dumort, Lamiaceae Martinov, and Asteraceae Giseke were each represented by two species, while the other eight families were each represented by one species.

Table 1. Wild plant species, families, uses, sales forms, and elevation zones recorded in the study area.

№	Latin name	Family	Usage section	Sales form	Approximate elevation zone
1	<i>Fagus orientalis</i> Lipsky	Fagaceae Dumort.	Fruit	Dry	High (900–2000 m)
2	<i>Malus orientalis</i> Uglitzk.	Rosaceae Juss.	Fruit	Fresh/Dry	Middle (500–1500 m)
3	<i>Quercus iberica</i> Steven ex M.Bieb.	Fagaceae Dumort	Fruit, leaf	Dry	Lower-middle (400–1000 m)
4	<i>Pyrus caucasica</i> Fed.	Rosaceae Juss.	Fruit	Fresh/Dry	Orta (500–1500 m)
5	<i>Mespilus germanica</i> L.	Rosaceae Juss.	Meyvə	Fresh/Dry	Aşağı-orta (400–1000 m)
6	<i>Prunus divaricata</i> Ledeb.	Rosaceae Juss.	Fruit	Fresh/Dry	Aşağı-orta (400–1000 m)
7	<i>Rosa canina</i> L.	Rosaceae Juss.	Fruit	Dry	Geniş yayılmış (400–1800 m)
8	<i>Cornus mas</i> L.	Cornaceae Bercht.&J.Presl	Fruit	Fresh/Dry	Aşağı-orta (400–1000 m)
9	<i>Rubus idaeus</i> L.	Rosaceae Juss.	Fruit	Fresh/Dry	Orta-yüksək (800–1800 m)
10	<i>Crataegus orientalis</i> Pall.ex M.Bieb	Rosaceae Juss.	Fruit	Fresh/Dry	Orta (500–1500 m)
11	<i>Portulaca oleracea</i> L.	Portulacaceae Juss.	Leaf/stem	Fresh	Aşağı (0–600 m)
12	<i>Thymus kotschyanus</i> Boiss. & Hohen.	Lamiaceae Martinov.	Leaf/flower	Fresh/Dry	Aşağı-orta (300–1200 m)
13	<i>Hypericum perforatum</i> L.	Hypericaceae Juss.	Flower/stem	Dry	Aşağı-orta (300–1200 m)
14	<i>Falcaria vulgaris</i> Bernh.	Apiaceae Lindl.	Leaf/stem	Fresh	Aşağı (0–800 m)
15	<i>Mentha pulegium</i> L.	Lamiaceae Martinov	Leaf	Fresh/Dry	Aşağı (0–800 m)
16	<i>Achillea millefolium</i> L.	Asteraceae Giseke	Flower/leaf	Dry	Geniş yayılmış (300–1500 m)
17	<i>Matricaria chamomilla</i> L.	Asteraceae Giseke	Fower	Dry	Aşağı (0–600 m)
18	<i>Rumex acetosa</i> L.	Polygonaceae Juss.	Leaf	Fresh	Aşağı (0–800 m)
19	<i>Peganum harmala</i> L.	Nitrariaceae Lindl.	Seed	Dry	Aşağı, quraq (0–800 m)
20	<i>Bifora radians</i> M.Bieb.	Apiaceae Lindl.	Leaf/seed	Fresh	Aşağı-orta (0–1000 m)



21	<i>Stellaria media</i> (L.) Vill	<i>Caryophyllaceae</i> Juss.	Leaf/stem	Fresh	Aşağı (0–800 m)
22	<i>Urtica dioica</i> L.	<i>Urticaceae</i> Juss.	Leaf	Fresh/Dry	Geniş yayılmış (0–1500 m)
23	<i>Asparagus officinalis</i> L.	<i>Asparagaceae</i> Juss.	Young shoot	Fresh	Aşağı (0–600 m)

3.1. Social division of plant gathering

Plant gathering within the community varies according to both gender and topographical zone. Gathering activities in high-mountain zones (involving tree fruits and species characteristic of mid-to-high altitude zones) are primarily carried out by men, whereas in low-lying and foothill zones (involving herbaceous plants and wild vegetables), they are mainly performed by women (Elias, 2017). Children support their parents in both zones and also engage in selling seasonal produce by the roadside during school holidays.

3.2. Sales model

The sale of the gathered plants is carried out through two main channels. Roadside sales of seasonal and highly perishable produce are primarily conducted by children. Both fresh and dried product varieties are sold at local markets by all family members. The form of sale varies depending on how quickly the plant spoils. Plants such as **Portulaca oleracea* L.*, which do not dry well and whose leaves spoil quickly, are sold only in fresh or pickled form. Species of the genera **Thymus**, **Mentha**, and **Rumex** are sold both fresh and in dried form—intended for long-term storage—to meet market demand. Species such as **Prunus divaricata* Ledeb.* (Batsatsashvili et al., 2017). **Pyrus caucasica**, **Mespilus germanica* L.*, **Cornus mas* L.*, and **Rubus idaeus* L.* are sold fresh, dried, or pickled, as well as in the form of preserves, vinegar, compote, and the like.

Table 2. Key characteristics of the value chain for recorded wild plants.

Indicator	Result
Number of recorded species	23
Number of families	13
Assembly areas	Low, middle, and high mountainous areas
Collection groups	Men, women, and schoolchildren
Sales channels	Roadside sales and local market
Sales formats	Fresh, dried, and processed products
Economic significance	Additional or primary source of family income

3.3. Contribution of income to livelihood

Due to the sensitive nature of the financial information, the majority of survey participants refrained from sharing exact income figures. However, it is reported that the sale of seasonal wild plants is the primary



source of livelihood for a number of families (Angelsen et al., 2014). This indicates that the trade in wild plants plays an important role as a livelihood strategy for some households.

4. Discussion

The results of the study show that, within the Lezgin community of Quba, ethnobotanical knowledge constitutes not merely cultural heritage but also an active economic strategy. Gender distribution based on topographic zones—with men in higher zones and women in lower zones—reflects the community's socio-ecological organization adapted to the physical environment. The involvement of children in gathering and sales activities under parental supervision from an early age demonstrates a living mechanism for the transmission of ethnobotanical knowledge from generation to generation through practical experience (Faruk et al., 2024).

4.1. Potential for value chain expansion

Current research shows that the Lezgin community of Quba sells wild plants primarily in a raw or minimally processed form. This holds untapped potential in terms of value creation. Based on successful experiences in other mountainous regions, initiatives such as cosmetic products, functional beverages, fruit teas, homemade vinegar, and labels or souvenirs made from tree bark—produced without harming the living tree—can be recommended for community-level income diversification and small-scale social entrepreneurship (Dong et al., nd; Angelsen et al., 2014). These directions are presented as analytical recommendations based on existing value chain data, rather than being based on actual observations made in the current study.

5. Conclusion

This study evaluates traditional ethnobotanical knowledge regarding the use, collection, and sale of wild plants within the Lezgin community of the Quba district, based on the FAO/CIFOR value chain approach. As a result of the study, 23 wild plant species belonging to 13 families were recorded, and their forms of use, harvesting characteristics, sales channels, and role in family livelihoods were investigated.

The results obtained indicate that the gathering of wild plants within the community is organized in accordance with local conditions and the intra-family division of labor. Plants growing in high-mountain zones are primarily gathered by men, while those growing at low and medium altitudes are gathered by women. School-age children play an important role in the intergenerational transmission of traditional ethnobotanical knowledge by participating in both the harvesting and seasonal sales processes. The study also showed that for some households, the sale of wild plants is one of the important livelihood strategies. At the same time, the fact that products are primarily sold in raw or minimally processed form indicates that there is still untapped potential for creating added value. The results obtained can provide a scientific basis for developing future programs and projects aimed at the sustainable management of wild plant resources in mountainous areas, enhancing the socio-economic well-being of local communities, and preserving traditional ethnobotanical knowledge. It is considered advisable to conduct future studies that cover a broader geographical area and incorporate a quantitative assessment of economic indicators.

Author's contribution

The sole author is responsible for conceptualizing, collecting, and analyzing data, and writing and editing the manuscript.

Conflict of Interest

The authors declare no conflicts of interest.



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The Freedom Struggle of the Caucasian Highlanders in the XIX Century and the Influence of Mountain Relief on Military Tactics

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Abstract. In this work, we consider the resistance of the Caucasian highlanders during the 19th century in relation to the Caucasian War of 1817-1864 (although several Western authors date this period from 1763 to 1864). We compare the two main centers of geopolitical resistance: the organized resistance headed by Imam Shamil in the Northeast Caucasus (Chechnya and Dagestan), and the more scattered but no less consistent resistance of the Circassians (Adyg) in the Northwest Caucasus. In this work, the main emphasis is placed on the relationship between the geography of the Caucasus mountains – gorges, mountain ranges, forest cover, and mountain auls – and the tactics used by both sides of the conflict: the highlanders and the Russian army. With the help of historical-comparative and descriptive-analytical approaches, this work shows how the geography of the Caucasian mountains was not just the environment for the war, but its active component: it made the highlanders engage in guerrilla tactics instead of fighting in the open field, forced the Russian command to change its operational methods – building roads, deforestation, the policy of settling Cossacks, and building the fortified network. We discuss the emigration (muhajirism) that occurred after the end of military operations in the Northwest Caucasus in 1864: although this process is referred to as genocide by several researchers and several countries (for example, the Georgian Parliament in 2011), the official Russian historiography does not accept this view, and this work presents the dispute objectively, mentioning both points of view. We conclude that neither the duration of the Caucasian War nor the similarities and differences in tactical methods in its two different theaters can be explained without taking into account the decisive role of the terrain.

Keywords: *Caucasus, Caucasian War, mountain warfare, guerrilla tactics, Imam Shamil, Caucasian Imamate, Circassian resistance, muhajirism, military geography, national resistance*

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1. Introduction

The 19th century for the peoples of the North Caucasus was defined by a protracted and unequal struggle against an ever-expanding imperial power. After having brought Georgia and parts of the South Caucasus under Russian domination, the Russian imperial regime attempted to solidify its grasp on the wider region. However, in the rugged terrain of Chechnya, Dagestan, and Circassia, the empire faced a different challenge to the traditional imperial wars that it had engaged in against Iran and the Ottoman Empire. A protracted conflict, which came to be known as the Caucasian War, was to rage over several decades of mixed alliances and evolving tactics among communities of mountain dwellers, religious leaders, and local elites who sought to avoid incorporation into the Russian imperial administrative and taxation regime (Jersild, 2002).



The precise timing of the Caucasian War, whether the conflict officially commenced in 1817 when the commander of Russian forces in the Caucasus, General Alexey Yermolov was appointed or whether the conflict goes back further to the latter half of 18th century with Russian settlement in the North Caucasus beginning in 1763 (King, 2008), with the founding of fortress in Mozdok and the further expansion into Circassian lands as has been argued by some Western and North Caucasian scholars and in general in historiography it can date back to 1817, remains somewhat contentious, not simply concerning the specific historical data, but rather representing an understanding as to the very nature and scope of the wars. Beyond the political history and military chronology of the Caucasian Wars – which is extensively covered in historical studies – this article attempts to analyse an element which was clearly stated but poorly analyzed in the literature. The role of the mountain geography of the Caucasus has influenced the military procedures. A narrow mountain gorge, a high steep peak, dense forests, and remote khorog on inaccessible slopes where auls are located influence possibility both sides (Griffin, 2004).

For mountain peoples of the Caucasus, the environment helped protect them and suggested the choice of unconventional guerrilla tactics (ambush, surprise attacks from shelter, detachments). Russian army found itself in difficulty; movement and supply lines had to be adjusted and adapted for the features of this environment. Also need to be noted that the Caucasian Wars cannot be viewed as one integral conflict. It encompasses a series of wars – the Russian-Chechen, Russo-Daghestani, and Russo-Circassian (Bliev & Degoev, 1994).

All this can be united in one process of the struggle against the Russian expanding regime, and it presupposed the use of mountain terrain for military operations; however, they did differ in the territorial features of a region, the social organization of societies, peculiarities of military groups. For these reasons, in this work, this war, the northeastern Caucasian example, the movement guided by Imam Shamil separately, and later by compare them with the struggle of North–West Caucasians, as for circumstances, tactics, and outcomes, different. This study makes an attempt to answer the following questions: What were the stages and drivers of the highland liberation movement in the 19th century? How has the mountainous environment of the Caucasus influenced the tactics and organization of the movement in this period?

To what extent are they similar to one another, and the reasons for discrepancies in resistance forms in the North–East and North – West of the Caucasus? How did the Russian Imperial Army modify tactics and organizational aspects for combat operations in mountainous terrain? Did these peculiarities cause protracted conflict in the Caucasian War as a result not only from the above-mentioned factors but also from the interdependence of geographical circumstances and military strategy?

This paper carries out analyses using a historical–descriptive method and compares cases of military and political developments; a theoretical discussion on mountain warfare, together with historical research about the Caucasian Wars, has been considered in this work in order to provide a clear picture of what led to varied developments within the Caucasus, and why Russian imperial control took so much time to take effect.

2. Historical Context of the Freedom Struggle of the Caucasus Mountaineers.

2.1. Socio-Political Organization of Mountain Societies in the Pre-Globalization Era

In the early 19th century, socio-political structures in North Caucasian mountain societies were based much less on consolidated state power and much more on traditional clan-tribal and rural structures rooted in customary law (adat). In Dagestan there were dozens of small "free communes" (jamaat), each with its own traditions, assembly and a complicated system of alliances and mutual rivalry with adjacent communes. Likewise, in Chechnya it was primarily kin-based organisations - teips.

To the north-west of the Caucasus, things were a bit more complex: while there was evidence of some feudal hierarchical principalities like the Kabardian one, most Circassian (adyge) tribes (especially those



inhabiting the coast) had a democratic-communal structure exempt from princely rule.

And so, while this decentralised mode helped Moscow fight a concerted, uniform opposition, it paralysed the Russian armed forces, used to topple a whole people by seizure of the center and administrative organs. As a result, the highlanders had to be gradually captured, one commune at a time. This often took some time to accomplish.

2.2. The Origins of the Resistance and the Yermolov Era

The establishment of a unified highlander resistance in the North Caucasus usually goes back to the last two centuries of the 18th century and the first two centuries of the 19th. It was then that the Russian extension of fortification lines on both sides of the Terek and Kuban rivers increasingly encroached on mountain communities' independence. Many local historiographies claim that General Aleksey Yermolov's appointment to the post of commander of the Caucasian Corps in 1816 is a turning point. Yermolov's policy of punitive raids, forced relocation, and construction of fortification lines deep in the mountains pushed Chechen, Avar, and other Daghestani mountain societies towards unity (Baddeley, 2013; Gammer, 2006).

The strategy employed by Yermolov had two key components. First, it consisted of 'opening up' mountainous territory to Russian presence, which consisted of clearing forests and building new roads into the mountains; second, the use of severe punitive measures against resisting societies, which included burning settlements and relocating communities. Despite all the facts, these measures increased Russian territorial and authoritative control in the short run, and had the opposite effect in the long run. These facts pushed the mountain societies together.

2.3. The Muridism Movement and the Ideology of the Ghazavat

The stirrings caused by Yermolov's era produced Muridism—a religious-political movement that fused the esoteric practice of Sufism with open religious warfare (ghazawat) against the invading empire (Zelkina, 2000). Its leaders—first Ghazi Muhammad and Hamzat Bek, and most enduringly Imam Shamil—managed to organize disparate acts of opposition into a logical, unified ideological movement. We are here dealing not merely with a religious movement; Muridism also played a crucial role in uniting mountain society under a single central authority, the antithesis of previously existing tribal and village independence.

The introduction of a unified, sharia-based legal and administrative system was crucial, as the customary law was inherently piecemeal and localized. The latter was replaced by a fully fledged, if imposed, law for all subjects of the Imam. Along with this shared ideology of struggle and of martyrdom, the mountain societies, hitherto broken by tribal distinctions, maintained an organized struggle for decades.

2.4. Imam Shamil and the Caucasian Imamate

Between 1834 and his capitulation in 1859, Imam Shamil organized a resistance movement in the Chechen and Daghestani mountains, uniting local tribes into a theocratic state (the Caucasian Imamate) that had its own courts, tax and revenue collection systems, and military formations (Gammer, 2003). Shamil's command structure and strategy can be viewed as a variation on an archetype that runs throughout most national or religious based resistance movements: a unifying ideology and a widely dispersed military organization grounded in the local territory and taking advantage of defensive opportunities provided by its contours and topology (Kaziev, 2001).

Shamil's armies always had the numerical inferiority; they didn't even have a comparable level of artillery and logistical capability. What they had was an instinctive relationship with, and tactical capability to exploit, the high mountains in which they found themselves, something no outside opponent was to have. It is this relationship of forces that helps explain why warfare was to take on its present form, and how the highlanders' (however it fell short in its initial political objectives) war of freedom continued so long against their Russian opponent.

2.5. Management Structure of the Caucasus Imamate



It was not just a military pact - The Imamate of the Caucasus was an actual organisation, a state it could even be called; it had its own institutions. Its area was split into a number of provinces with a "naib" (a substitute) appointed by the Imam, which possessed civil and military powers and was directly to reply to the Imam. Shariat superseded local customary law; taxation was centralized; there were arms production workshops; a new system of military organisation was put into service. All this, reinforced by the mountainous terrain, allowed the Imamate to withstand to such a powerful empire as Russia for a couple of decades.

Not everyone accepted all the changes the movement introduced. Localities didn't wish to reduce their traditional freedoms and, at some point, they went over to the Russian side as well. This situation caused a lasting historiographical dispute about whether the national or the religious movement was in predominance for Shamil's organization.

2.6. Shamil's Foreign Relations: Ottoman and British Factors

Imam Shamil did not operate alone during his campaigns, and he always worked to establish diplomatic connections with the Ottoman Empire and Britain, and to gain their support and official recognition of his position. During the Crimean War between the Ottoman Empire and Russia (1853-56), Shamil tried to ally with the Ottomans and planned an offensive toward Georgia, but these plans did not yield significant results (Hamburg, Sanders, & Tucker, 2004). Public sympathy for Shamil and his cause existed in Britain and was reported on by many journalists, but no practical aid from Britain was ever received at a government level. The reason for this policy vacuum seems to lie in the fact that the Caucasus question was simply not a high enough priority for either the Ottoman Empire or Britain; for both of these powers, the risks of provoking an immediate, large-scale war with Russia far outweigh any benefit they might receive.

The example also highlights how a military superiority gained through geographical terrain was not necessarily sufficient to negate the weakness caused by a lack of foreign political support; no matter the longevity of a local struggle, its success against a vast empire with numerically and militarily superior resources depended, to some extent, on assistance from beyond local borders.

3. Circassian Resistance in the Northwest Caucasus

3.1. Political Organization of Circassian Communities

Circassian (Adyghe) communities of the Northwest Caucasus do not give us such a model of a union around a single religiously-political center (as opposed to the northeast Caucasus) but rather actions of individual tribes, federations of tribes, Shapsugh, Abzeks, Ubykhs, Natukhai, etc (Jaimoukha, 2001; Natho, 2009), in response to an imagined general enemy. After events in the northeast Caucasus, the northwest Caucasus did experience a limited level of centralizing pressure in the 1830s with attempts by naibs like Muhammad-amin to launch campaigns into the area under the authority of Shamil, though without any sustained impact in terms of formal institutional centralization.¹²⁵ yet for all its greater diffusion of organization, it was no less resilient and effective. The character of the natural environment and, first and foremost, the coastal rich forests and very complicated mountainous terrain of the foothill-mountainous regions of the North Caucasus in the given range afforded advantages in battle for Circassian fighters of particular interest for the following examination (Henze, 1992).

3.2. Impact of the Russo-Circassian War and the Crimean War

The Russo-Circassian War period is viewed within a 108-year war, starting in 1763, which date - according to some Western researchers - was regarded as the first date of the Russian-Circassian war with the establishment of Russian defensive fortresses in Mozdok. With the beginning of the Crimean War of 1853-56, Circassian chiefs tried to seek foreign support from the Ottoman Empire and Great Britain. However, the British and the French, following the signing of the Treaty of Paris, turned away from the Caucasus issue, thus increasing their isolation. Russia could now bring all her attention to bear on the Caucasus, and



Yevdokimov proceeded to wage a war of a thoroughly military and administrative nature, of resettlement and repopulation with Cossacks, on a large scale, of the depopulated parts of the Northwest Caucasus.

3.3. Migration: Mass Migration and Its Interpretation in Historiography

It became the object of fierce discussions in contemporary historiography how historical-legal qualification of those events would be given: numerous representatives from the West (Walter Richmond and others) and from Circassian communities consider the represented processes as a genocide as a consequence of deliberate destruction and/or eviction, and in 2011 the Georgian Parliament even defined those events by a special resolution as a genocide (Richmond, 2013). By this date, it can be said that the process of mass emigration (muhajirism), which is regarded as the greatest trauma in Circassian history and displaced over one million (some count only 100 000) Circassians from their native land into different Ottoman regions, in which many have perished during the voyage from epidemics, starvation, and shipwrecks, has come to an end.

The historical-legal characterization of these events has become the issue of a serious debate in modern historiography: number of the researchers from the West (Walter Richmond etc.) and Circassian diaspora organizations interpret the described process as a genocide, referring on intentional pursuit on the extermination or deportation of the population, and in 2011 a special resolution adopted by the Georgian Parliament, the events were called genocide. In contemporary Russian historiography, they interpret it as forced resettlement under the circumstances of war and its inevitable humanitarian implications (Shenfield, 1999). Being objective to both positions, the article states that the question of the definition of these events is debatable, but the factual existence of mass destruction and deportation is a well-documented phenomenon.

The significance of analysis of the process of muhajirism also lies in explaining the weakness of possible long-term resistance on the basis of the terrain of the mountains and forests: despite the ability of territory to retard the army campaign, if the opponent were disposed to systematic conquest and destruction of its lands, deforestation and deportation, military-geographic arguments could not change political and demographic conclusions.

4. Mountainous Terrain as a Determinant of Military Tactics

4.1. Geomorphology of the Caucasus and Its Strategic Implications

The Great Caucasus chain contains a system of sharp ranges parallel to each other, intersected by deep gorges crossing and deep rivers that cut into the canyons, and usually it passes through these passes. The fortresses and defensive works of highlanders' settlements in Dagestan and mountain Chechnya were built up to rock faces (cliffs), which themselves formed the main or one-sided defense; the other sides were fortified with stone ramparts and narrow approaches (one or few), easily accessible for an ambush. A sort of defensive system needing neither walls nor any constructive solutions was created naturally by nature's landscape itself. The landscape gave highlanders several tactical advantages a regular army almost never had: firstly, it leveled the Russians' advantage of numbers and numbers of cannon, since even the best of machine guns could not be used on high and steep elevations or in the passes.

Secondly, it allowed small mobile units to deal fatal damage to large convoys navigating through a defile. A force marching in a narrow pass can simultaneously sustain fire from both flanks from the heights, with little opportunity for maneuver or escape. And thirdly, especially in Chechnya, low slopes covered by dense forests made conventional observation almost impossible; that was to the advantage of fighters with deeper local knowledge.



4.3. Mobility, Ambush and Fortified Settlements Tactics

"In this terrain the Highlander guerrillas had devised tactical methods quite suited to it. The Highland "in two's" strategy of open country attack combined with territorial defence was a statement on a more general truth. Avoid war altogether with the opposing major power and, if forced into it, take offensive action only by favour of any favourable terrain which you are forced to take into account (and not the opponent's). Small bands of highlanders would attack solitary garrisons or troop convoys, and then vanish into terrain in which it was almost impossible for the regulars' horse and foot to pursue. It is, however, this wider phenomenon of the strategy of irregular war whereby a weaker force in terms of technology or of numbers combats a stronger regularly arrayed one, when there is rugged topography involved, whether mountains or densely forested country (Baumann, 1993).

In conjunction, the stone walls of the mountains served whenever required as strong points to permit sustained, positional fighting, such as that involved in several of the war's greatest sieges. The bifurcate nature of the highlander's strategy: highly mobile in open ground; firmly static in defense on the defensive, where it enjoyed the benefits of the topography reflected a broader principle: do not commit at all to decisive battle when you can help it; and where do commit at all to an assault on any territory you propose to conquer, so far as you possibly can – as much by virtue of the terrain you are required to contend with, as of your will to deny an opponent every advantage.

4.3. Case Events: Akhulgo, Dargo and Gunib

There was, however, a certain number of events during the long conflict wherein terrain and strategy intersected to serve as particularly good examples to illustrate what kind of results this mixture would engender. Akhulgo of 1839 was a fortified aul perched upon a rocky crag virtually isolated on a river and the result of the several-weeks-long siege involving large casualties of both opposing sides was that the Russians finally stormed the position (Kaziev, 2008); the latter shows how a position can be occupied despite severe disadvantages either in firepower or indeed in numerical superiority.

Russia's Prince Mikhail Vorontsov's campaigning of 1845 had demonstrated more clearly still the dangers faced by regular troops operating so far into enemy territory of the mountainous regions – after Russia had reached, captured and burned Dargo (Blanch, 1960); the return through forests susceptible to ambushes was costly, and in historians' view disproportionate losses, and this example often served in Russia to demonstrate that mere seizure of territory without effective control of its routes to communication would not pay off - although Russia eventually achieved and held it for decades.

Russian command had changed its operating pattern by the end of the protracted conflicts, though - for the last significant operation, the siege of Gunib, which brought about Shamil's surrender, and where the Russian commander (Prince Alexander Baryatinsky) utilized the advantage of operating as converging bodies to block exit routes, for example, to provide cover for his troops, to starve his foes without the perils of mass assault.

4.4. The Influence of Forested Terrain in the Western Caucasus on Circassian Tactics

In stark contrast to the open, rocky plains of the Northeast Caucasus, the Northwest Caucasus territory was, for the most part, a region of high foothills and dense forests. This resulted in a slightly different strategy being employed by the Circassian fighters than by Shamil's forces: instead of the sustained defence behind fortified aul walls seen in Daghestan, the former utilized forest ambushes, hidden movement through vegetation, and quickly devastating raids by small groups, instead. It is therefore understandable that the most important means of counter-strategy employed by the Russian army in the Northwest Caucasus was the systematically enforced, total deforestation of the area; without the forests, the cornerstone of Circassian strategy disappeared.

Such forest-clearing operations, orchestrated by General Yevdokimov, combined with the subsequent



establishment of a vast road network and proliferation of Cossack stanitsas (military-agricultural settlements), altered the military-geographic character of the territory, and greatly reduced the military-geographic advantages enjoyed by the Circassians. That Circassian resistance eventually culminated in total emigration after total military defeat - i.e., a complete demographic expulsion of the population from its land - rather than the conclusion met with in the East Caucasus, is therefore not wholly inexplicable.

5. Adaptation of Russian Military Forces to Mountain Warfare

5.1. Transition from Punitive Expeditions to Systematic Sieges

Part of the reason the Caucasian War took so long was that the Russian imperial army approached the beginning of the war with the techniques that had evolved from regular war against state armies, and these had limited use against an irregular enemy in the mountainous terrain. The first punitive raids against Highlander villages, first under commanders like Yermolov and Grabbe, often brought tactical victories, but the gains were only short-term because the Highlanders could escape into terrain the Russian army could neither garrison nor patrol, and could retreat and regroup. Eventually, the Russians began a much more methodical approach combining forward movement with construction of fortified lines and multi-column advances to seal off districts rather than simple attacks on settlements. Under the command of Baryatinsky and N.I. Yevdokimov for the final stage of the war, they began to learn how mountains could be conquered by slow investment rather than isolated punitive raids.

5.2. Roads, Deforestation and Fortifications

Perhaps the most innovative Russian approach to mountain warfare was the establishment of the 'forest' regime on roads and surrounding fixed positions, in order to remove one of the key sources of secrecy for Highlander ambushes. The construction of new roads through terrain hitherto impassable had two effects, namely 'to increase the speed of movement of all armaments and all transport' and 'to eliminate those advantages of space possessed by highlanders in high mountain zones where other troops' transport cannot pass without a road and all supplies'. Meanwhile, the systematic consolidation and extension of Russia's network of fortifications in key valleys and passes continuously reduced the maneuvering room for highlander resistance. This illustrated a clear example of the 'accumulative result over long periods of engineers' success' overwhelming the natural tactical advantages of mountainous terrain.

It must, however, be stressed that these tactics had evolved over long periods and at great cost in terms of both life and resources; the evident high stakes placed on terrain in this battle of imbalanced powers would be indicated by the longevity of the conflict with highland tribes of half a century or more of relatively constant combat (in the E. Caucasus) and of about three-quarters of a century in the longer perspective E. Caucasus, etc.).

5.3. Cossack Settlement Strategy

And not just by Military Engineering measures but to maintain long-term control over the region, the Russians resort to the tactic of demographic strategy. We shall replace the native population in the areas under Russian rule with a Cossack colony in the form of *astanitsa*, a militaro-agricultural colony permanently on watch with connection to regular troops (Barrett, 1999). And this was practised especially widely in the Northwest Caucasus; and so, following military success, an abrupt restructuring began to take place in the ethno-demographic terms of this region of our country, showing what one could oppose as long-term demographic and administrative measures, with the support of military advantage inherent in mountain terrain.

5.4. Exploration, Local Guides and Collaborating Highlanders

Another (though less investigated but important) aspect of the Russian success in this environment was that locals served as guides, interpreters, and members of allied detachments among the Russian army. Not



every highland community allied itself with either Shamil or the Circassians; a range of communities had their own locally framed objectives, often linked to inter-family and inter-clan disputes and a desire to survive. This naturally often resulted in these communities defecting to the Russian side to assist the army through the mountains. This highlights that this important aspect of terrain-based advantage of information, i.e., familiarity with locality (the local map knowledge) was by no means exclusive to the resistance forces.

It further demonstrates why the Russian forces found their ability to navigate and conduct reconnaissance in the mountains continuously improved in spite of the other hurdles; locally sourced intel eventually turned many supposedly 'unfamiliar' routes through high mountain passes, concealed paths and annual nomad paths familiar to the army, thereby offsetting some aspect of the informational terrain superiority held by the defender.

5.5. Climate, Seasonality and Logistical Challenges

The Impact of climate and seasonality on military tactics. When evaluating the effects of mountain terrain on military operations, one must not underestimate the influence of climate and seasons. On the peaks of the Caucasus, winter snows blocked many of the mountain passes for months, and melting spring snow produced floods and mudflows that destroyed communications facilities such as bridges and roads. Both sides, on this basis alone, would be severely limited in their timetable for the waging of warfare: the Russian side would largely be forced to concentrate large-scale offensives between spring-summer and autumn and in this manner limit warfare strictly to warm weather.

Meanwhile, the Highlanders would effectively use winter to stock provisions, maintain weapons, and so on in preparation for the following period of hostilities. Logistics: On an extremely practical note, providing supply lines in mountains was a particularly hard challenge for the Russian army. Every convoy could be considered as an individual (and difficult to defend, subject as convoys are to enemy attack and ambush as they would likely be at various points along the route) military action in itself - thus substantial human and material resources would have to be devoted not to the fight itself but to securing the transport routes - giving a clue as to the extent that military operations were influenced not only on the battlefield itself but also at a strategic and planning level, due to its mountainous characteristics.

6. Comparative Analysis: Eastern and Western Caucasus Resistance Models

A comparison of resistance experiences between the Eastern and Western Caucasus offers several interesting insights. On both sides of the range, the same strategic parameters apply – the mountain geography was the main basis for a lasting struggle; the same road-building, deforestation, fortification, and demographic warfare would eventually be waged by the Russian army against both. Differences are equally marked, however. Firstly, as far as political structure is concerned, the Eastern Caucasus yielded an institutional, centralized state in the form of the Caucasian Imamate.

A similar high level of organization failed to emerge in the Western Caucasus, where resistance largely remained tribal in nature. Secondly, terrain structure in the Eastern Caucasus (high-mountainous, rocky, open) provided the possibility of static fortified defense (Akhulgo), whereas terrain in the Western Caucasus (forested foothills) provided excellent conditions for mobile ambush tactics. And most crucially, resistance took a much more devastating demographic turn in the Western Caucasus when a protracted, but ultimately successful, displacement of the population occurred instead of an agreement of capitulation. The comparison thus shows not only the impact of mountain landscape on the practices of warfare as a generally recurrent phenomenon but also demonstrates the dependence of the actual outcome of that influence on the peculiarities of the form of political organization existing there, on the opponent's strategic moves and even on a particular historical setting of a fight (such as the results of the Crimean War for the western Caucasus). The territory is never simply decisive; rather, it shapes the boundaries of the feasible strategies.



7. The Legacy of the Struggle and Its Place in the Collective Memory

7.1. Shamil and the Circassian Resistance in the National Collective Memory

Aftermath and Collective Memory and Identity (21 May and the “Circassian Holocaust”) XIX The Caucasian War legacy also takes a central position in the current collective memory and nation-building process in the region. A reference character that emerges in the narratives of the dastans and folklore associated with the War is Imam Shamil, whose personality as a symbol of independence, religious sincerity, and the obstinate struggle against external occupation is remembered, and place-names, buildings, and courses of study continue today carrying his name. In the Circassian Diaspora-living in Turkey, Jordan, Syria, etc.- also, the 1864 exile remains the fundamental triggering traumatic act of creation of a nation and is commemorated annually as an “exile day”(21st of May). Viewed in this way, an analysis of the XIX Century Caucasus War provides not only another chapter on Military History, but rather is an essential background for the comprehension of the formation of national identity and the collective memory in the region. The resilience of the region, provided by its topography over millennia, helps us to establish a direct link between the way today’s generations conceptualize their past and the events that are regarded as glorious or a source of collective trauma.

7.2. Literary and Artistic Echo

The Caucasian War has also made its mark in Russian literature. First and foremost, the childhood and young service as an officer for some time in the Caucasus inspired Leo Tolstoy. His work Hadji Murat became among the earliest books to offer to the Russian readership a far richer and more ambivalent conception of Highlander opposition to Moscow (Tolstoy, 1912). Together with it, the Caucasus-related literary output of Mikhail Lermontov also played a significant role in forging for the readers of the period an image of the “wild though honourable” Caucasus in Russian Romanticism (Layton, 1994).

8. Result

The 19th-century highlander freedom struggle was inexplicable in exclusively political or religious terms; Muridism and the Imamate of Imam Shamil, as much as the less coherent but similarly persistent struggle of Circassia of the North-Western Caucasus, offered both the intellectual basis and the organizing frame, but it was the physical space of the Caucasus that for decades sustained the strategic feasibility of war against the stronger empire. Mountains became their fortress, ambush site, and refuge; they drew them to fluid, guerrilla warfare, while forcing an overhauling of conventional warfare approaches by the imperial Russian Army towards relentless road and forest construction, settlement of Cossacks in key areas, planned encirclement, etc. Of land in the highlanders’ midst. Akhulgo, Dargo, and Gunib demonstrate that tactical primacy gradually switched hands from the early highlanders’ exploitation of local terrain conditions into ambush and fortification, to eventual Russian hegemony in mountain warfare through years of costly adjustments.

In turn, by contrast between Eastern and Western Caucasus experiences we see that if terrain influence is ubiquitous, in specific cases both the forms of political organizing, as much as specific contexts of foreign politics made important differences to how this influence manifested - in the one instance a personally chosen act of capitulation, and in the other, a tragically decided forced emigration of people, the muhajirism. This history lesson teaches us a great deal about the place and meaning of terrain beyond the limits of the “Caucasus problem” per se: terrain is not neutral scenery of combat but an active element of strategy which can guarantee sustainability of resistance, direct tactics of two belligerent Parties and determine the very nature and duration of warfare between two unequals. I recommend this book also on the basis that its further studies would benefit from extending comparison with other mountain resistance movements in such locations as the Balkans, Hindu-Kush, or the Atlas, and thus may demonstrate whether here, specific as it may seem, patterns of mountain warfare revealed have wider applications. And I also



recommend it for the fact that the issue of the legal definition of the Circassians' emigration in historical and scholarly communities still remains, by reason of its nature, a lively and controversial subject of study.

Author's contribution

The sole author is responsible for conceptualizing, collecting, and analyzing data, and writing and editing the manuscript.

Conflict of Interest

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Relief, Protection and Climate in the Architecture of Mountain Peoples

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Abstract. Mountain village architecture of Azerbaijan is characterized by planning according to the relief, a step (terrace) construction system, and constructive engineering solutions. Houses are placed along the slope, follow the relief line, and are built with minimal interference to the soil layer. This approach reduces large excavations, minimizes the risk of landslides and erosion, and makes the construction process more economically efficient. Thick stone walls and supporting structures on the lower floors ensure stability, while light materials on the upper floors balance the load distribution. The back walls of some houses rest on the soil layer, providing thermal insulation and maintaining the stability of the internal temperature. Stepped construction and topographical planning also serve a socio-spatial function; multi-level spatial structure increases solidarity within the community, expands mutual control and security opportunities, and creates conditions for the formation of public and semi-public spaces. As a result, Azerbaijani mountain architecture demonstrates a model of sustainable living that integrates engineering, ecological, and social aspects and constitutes an example for modern sustainable architectural concepts.

Keywords: Azerbaijani mountains, mountain architecture, stepped construction, relief line tracing, efficient land use, stone wall construction, erosion and landslide risk

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1. Introduction

Residential spaces formed in the mountainous areas of Azerbaijan are not only the result of construction techniques or household needs, but also a complex product of socio-cultural development, economic activity, and interaction with the natural environment lasting for millennia. These living models emerged as a material expression of man's struggle for survival in harsh geographical conditions. The architectural examples formed in the mountain environment are a real indicator of the balance, adaptation, and interaction between man and nature.

The Greater Caucasus and Lesser Caucasus mountain systems, which cover an important part of the territory of Azerbaijan, are not only geographical areas, but also important zones where cultural diversity and ethnic richness are formed. Architectural forms developed in mountainous regions constitute a significant indicator of the interaction between humans and the natural environment (UNESCO, 2023). Villages and settlements located along these ridges have developed in conditions of complex relief structure, steep slopes, deep valleys, slippery soil layers, and seismic activity. In the process of settlement, the limitation of land areas, the scarcity of arable land, and the uneven distribution of water sources had a direct impact on the planning of living. For this reason, spatial organization in mountain villages is not random, but the result of rational planning in accordance with natural and geographical conditions. The climate factor also played a decisive role in the formation of mountain architecture.



In mountainous areas, winter months are long and harsh, temperature differences are sharp, winds are strong, and snow cover is thick. These conditions require a special approach to the construction of houses. Thick walls, small windows, rooms with low ceilings, and the use of heat-retaining materials were intended to minimize heat loss (Abbasov et al. 2022). At the same time, the intensity of solar radiation and the problem of dryness in the summer season led to the formation of the shading system of buildings, balconies, and inner courtyards. Mountain architecture thus provides a traditional and tried-and-true model of climate adaptation (Mustafayeva et al. 2025). Communication and transportation difficulties also affected the structure of living spaces. In historical times, mountain villages operated mainly based on self-sufficiency; access to foreign markets was limited. Since it was impossible to transport heavy construction materials from long distances, mainly local resources were used. Local stone, pieces of river rock, wood, and soil mixtures formed the main material base of the construction. This has created an important advantage in terms of both economic efficiency and environmental sustainability. Many of the principles presented in modern times as "sustainable architecture" have been traditionally applied in mountain communities. The historical safety factor has a special place in the planning of mountain habitats. Mountain villages formed a defensive spatial structure under the conditions of foreign attacks, inter-tribal conflicts, and political instability at different times. The spatial organization and defensive planning principles in mountain villages have been closely associated with historical security needs and the social structure. Proximity of houses to each other, narrow and winding street system, buildings built on high points, thick stone walls, and limited entry and exit points have been part of the collective security model. This structure not only provided physical protection but also strengthened social solidarity and a sense of mutual responsibility within the community. Thus, architecture here acted not only as an individual space, but as an indicator of collective identity and social organization. Another important feature of mountain architecture is that it does not conflict with the terrain but instead forms in harmony with the natural landscape. The architecture of mountain villages is built in harmony with the terrain and serves to protect the natural landscape. This approach also increases solidarity within the community and expands the possibilities of social control and security. Stepped house construction on sloping slopes, the roof of one house serving as the yard of another, construction of buildings with minimal intervention on the soil layer are examples of high adaptation from the point of view of engineering. This approach served to prevent landslides, reduce wind impact, and maintain energy balance. At the same time, the visual compatibility with the landscape created an aesthetic integrity. The socio-cultural aspect is also an integral part of mountain architecture. Activities such as family structure, economic activity, cattle breeding, and crafts have influenced the internal planning of space. The joint arrangement of living, household, and storage zones in houses has created functional efficiency. Yards and balconies acted as both domestic and social communication spaces. Thus, the architectural form has become an important mechanism that ensures the continuity of the social lifestyle. Constructive solutions aimed at energy efficiency in traditional mountain dwellings are consistent with the principles of sustainable modern architecture.

As a result, the architectural model formed in the mountainous areas of Azerbaijan is a complex synthesis of adaptation to the natural environment, social solidarity, and the need for security. This architectural tradition can be evaluated as a product of human ability to live in harsh geographical conditions, creative thinking, and collective experience. Architectural forms in the mountainous regions of Azerbaijan have been shaped by local climatic conditions, economic activities, and ethnographic traditions. In terms of modern architecture and urban planning, the experience of mountain communities is of great scientific and practical importance in terms of ecological sustainability, energy efficiency, and principles of harmony with nature. For example, the location of Khinalig in the context of the historical and architectural landscape required construction systems suitable for the terrain and climatic conditions. The mountain architecture traditions of the Caucasus influenced the formation of long-lasting architectural examples in ethnographic and cultural perspectives.

2. Principles of construction in accordance with the terrain

The main difficulty of the construction process in mountainous areas is the steep slope of the land surface, the instability of geological layers, and the risk of erosion and landslides (Mardanov 2022). In sloping areas, the thickness and bearing capacity of the soil layer are not the same; some parts are rocky, and some parts consist of loose and slippery rocks. This requires additional engineering calculations and constructive solutions during construction. Since traditional plain-type planning is not possible in the sloping terrain, the architectural form is built directly based on the conditions dictated by the terrain. The architectural model formed in the mountain villages of Azerbaijan is based on the principle of "not against the terrain, but with the terrain". Here, the sharp shape of the land is not considered an obstacle to be overcome, but a starting point for organizing the space. The buildings follow the direction of the slope, are placed according to the natural contours, and are built with minimal land intervention. This approach gives a more sustainable result from both an ecological and constructive point of view (Abbasov et al. 2022).



Figure 1. Guba Khinalig village. (Source: Laman Ismayilova).

Khinalig village is located at an altitude of more than 2000 meters above sea level and has an extremely complex structure in terms of relief (Figure 1). Khinalig is the highest, remotest, and most isolated village in Azerbaijan (Mustafayeva et al. 2025). There are more than 350 stone houses in the village; Although many of them were built two or three centuries ago, they are still inhabited. The village is built on a steep slope and is surrounded by deep ravines, rocky massifs, and exposed mountain ranges. This area is exposed to both strong winds and sharp temperature differences. In winter months, the snow cover is thick, and the freezing and melting of the soil layer affects the stability of buildings. Khinalig architecture is an engineering marvel: stone houses are built directly into steep mountain slopes, arranged in an amphitheater-shaped terrace system; the roof of a house becomes the yard of the house above. In such conditions, the arrangement of living spaces is not only a question of architecture, but also a question of engineering and adaptation to the natural environment. In high-altitude mountain villages such as Khinalig, the adaptation of buildings to the terrain and the use of local materials are among the key characteristics of architecture.



Houses in Khinalig are built step by step, that is, on the terrace principle. Khinalig houses are built of river stones and have a unique terrace structure; the roof of one house acts as the backyard of the next house. Due to the harsh climate, limited building space, and strong winds, the buildings are closely spaced. Mountain village architecture of Azerbaijan is based on the principles of planning and terraced construction. In the village of Khinalig, houses are placed along the slope and built following the relief line; this approach minimizes soil excavation and reduces the risk of landslides (Aliyeva 2024; UNESCO World Heritage Centre 2023). Each building is located on a certain part of the slope, and its lower part rests on the soil layer. The cultural landscape of the Khinalig people preserves its originality in terms of its forms, materials, uses, traditions, and intangible heritage (University of Massachusetts Amherst Center for Heritage & Society 2024).

This system provides several important advantages:

- The natural stability of the slope is preserved, and there is no abrupt cutting of the soil mass;
- Houses partially protect each other from wind and cold air currents;
- Limited land area is used to the maximum.

As a result of the stepped structure, the roof of a house functions as a yard or passageway for the house above. This multi-layered spatial use is both functionally and socially significant. The preparation of roof coverings with a soil and clay layer makes it possible to move on and, at the same time, strengthens thermal insulation. Thus, the roof is not only a covering element but acts as an extension of the living space. Another important aspect of the principle of construction according to the terrain is the minimization of soil excavation. In mountain villages, wide platforms are not created; on the contrary, buildings are placed on the existing natural surface. This reduces labor and material consumption and minimizes the risk of slipping. Since there is no major land intervention, the hydrological regime of the slope - that is, the flow direction of rain and snowmelt - is not seriously disturbed. Structurally, thick stone walls are used at lower levels. The stone material "fixes" the building to the ground with its weight and provides stability in contact with the ground. In the upper parts, lighter constructions are used, which balance the load distribution. The back walls of some houses lean directly on the slope, and the soil acts as a natural heat insulator. As a result, the temperature of the interior remains more stable. But despite all these adaptation mechanisms, the mountainous terrain creates several difficulties. Transporting construction materials along the slope requires a lot of physical labor. Heavy rains and misdirected snow runoff increase the risk of erosion and landslides (Mardanov 2022). Laying modern communication lines - water, sewage, gas, and electricity networks - requires complex engineering solutions. Seismic activity also necessitates additional structural reinforcement. In mountain villages, the stepped construction system not only increases structural stability but also strengthens the social function of the place; the roof of a house serves as a courtyard or passageway for the house above.

However, mountain villages that have been preserved for centuries prove that the principle of building according to the terrain is a sustainable and efficient model. This architectural form creates visual harmony with the landscape, minimal interference with the natural environment, and forms an energy-efficient system. The basics of the approaches presented in modern architecture, such as "contextual design" and "sustainable planning," have been traditionally applied in the mountain villages of Azerbaijan. Architectural features and material selection in Azerbaijani mountain villages have been developed in accordance with local climate and relief conditions. Stone building traditions provide engineering and environmental sustainability, enhancing the socio-spatial aspect (Maclachlan 2008).

Stepped (terrace) construction systems and following the relief line were among the main principles in the formation of Azerbaijani mountain architecture. In mountainous areas, the slope of the land surface, the instability of rocks, and the risk of erosion and landslides have directed the planning of residential areas in



a completely different direction than in plain areas. Since it is difficult both technically and economically to create wide and smooth platforms under these conditions, the construction tradition has developed by adapting to the natural terrain (Mardanov 2022). In Azerbaijani mountain villages, houses are arranged in steps along the slope, and each building is built on a unique terrace at a certain level. As a result, the village acquires the character of a multi-level composition and creates a single architectural ensemble with the landscape. In mountainous areas such as Sheki and Guba, all villages are terraced down the slope; houses and gardens are interconnected to maximize arable land.

The stepped system primarily provides structural stability. The lower part of the houses rests directly on the soil layer or rocky surface, and the thick stone walls increase the stability by lowering the center of gravity of the building. This method strengthens the resistance to soil pressure and reduces the risk of landslides. In traditional mountain architecture, extensive excavations are avoided, and the natural contour of the slope is preserved to the maximum extent. A sharp intervention in the soil layer can disrupt the geological stability of the slope and create a long-term danger. Therefore, the buildings are built following the direction of the natural surface, and the relief acts as the main guiding element of the architectural composition. Efficient use of land is one of the important advantages of this system. In mountainous areas, flat areas suitable for cultivation and living are limited. As a result of the staggered planning, each level becomes a separate usable space, and there is almost no free space left. This dense and compact structure reduces distances within the village, intensifies social ties, and creates efficiency in terms of communication. At the same time, it allows the protection of arable land areas. Thus, the architectural solution is not only a construction problem, but also a matter of maintaining the economic and economic balance. The stepped construction system also serves to reduce erosion (Mardanov 2022). Each building partially limits the movement of the soil mass at its level and, in a certain sense, performs the function of a retaining wall. This constructive solution helps to stabilize the slope during the flow of heavy rain and snowmelt water. In some cases, additional stone pillars and retaining walls are built at the bottom of the houses, which prevent landslides. The houses are arranged in steps, adjacent to each other along the slope; the flat roof of one house becomes the terrace of the next. Such engineering solutions are formed because of long-term experience and maintain balance with the natural environment. One distinctive feature of this system is that the roof of a house functions as a yard or passage space for another house located on the upper level. Roof coverings are usually made with a layer of earth and clay, which both improves thermal insulation and makes it possible to move on it. Thus, the roof is not only a protective structural element but also acts as an open space where daily household activities and social communication continue. This multi-layered spatial use enhances interaction within the village, strengthens neighborhood relations, and supports a collective life model. The use of stone walls in the architecture of Khinalig provides both engineering stability and increased thermal insulation, thus maintaining internal temperature stability in harsh winter conditions (AZERTAC, 2016).

The principle of tracing the relief line is one of the main features of Azerbaijani mountain architecture. Buildings and streets are built according to the natural direction of the slope; rigid and artificial straight lines are avoided. This approach preserves the ecological balance by minimally interfering with the soil layer and ensures the natural flow of rainwater. As a result, the hydrological system is not disturbed, and the risk of erosion is reduced. At the same time, the village becomes an integral part of the landscape and creates visual harmony. From a distance, mountain villages seem like a continuation of the natural environment.

All these features show that the stepped construction system and following the relief line is not a random choice in Azerbaijani mountain architecture, but a rational and sustainable model of adaptation to natural-geographical conditions. This model demonstrates high efficiency in terms of structural stability, efficient use of land, and social-spatial organization. The principles presented in modern architecture as "sustainable design" and "contextual planning" have been traditionally applied in the mountain villages of Azerbaijan for centuries (MacLachlan 2008). Thus, mountain architecture is a bright example of a harmonious and



sustainable living model created by people by adapting to their conditions without conflicting with nature. Following the relief line is considered one of the main principles in Azerbaijani mountain architecture, and this approach ensures both the safety and economic efficiency of buildings. In mountain villages, houses are built following the relief line; that is, the natural descent and ascent direction of the slope is preserved, and no artificial flat platforms are created. This directly affects the construction process and creates several important advantages. First, the need for large-scale excavations is reduced. Since construction is carried out according to the natural contours of the slope, extensive cutting or transportation of the soil layer is not required. This approach both reduces construction costs and maintains the geological stability of the slope.

Second, following the relief line minimizes the risk of slipping and collapsing. Soil layers in mountainous areas are often unstable, and the creation of artificial platforms can destabilize the soil. And construction according to the natural relief allows for maximum use of the natural stability of the soil layer, so the houses remain stable for a long time.

Thirdly, this approach makes the construction process more profitable from an economic point of view. Since the natural forms of the slope are preserved, the need for additional excavation works, soil transportation, and the construction of additional supports is reduced. This creates efficiency in terms of time, labor, and money. In general, the principle of following the relief line not only creates technical and economic advantages but also ensures the aesthetic and ecological sustainability of mountain villages. When the houses are placed according to the natural contours of the landscape, the villages are harmoniously integrated into the mountain environment; there is no conflict with nature and long-term sustainability is maintained. This principle is one of the traditional features of Azerbaijani mountain architecture and is important from the engineering, ecological, and cultural point of view.

Special structural solutions and engineering approaches are applied in mountain architecture to ensure the stability of buildings on sloping terrain. In mountain villages, thick stone walls are built in the lower part of the houses, which ensures the stability of the structure at the point of contact with the ground. The weight and density of the stone help the building stand firmly on the slope and at the same time increase resistance to soil pressure. This approach is especially vital in mountainous areas where there is a high risk of geological instability and landslides. The architectural practice developed in mountain villages is an example for modern sustainable architectural concepts because it combines nature, engineering, and socio-cultural aspects. Lighter materials are used on the upper floors, which balances the distribution of the load of the house and reduces the risk of deformation of the building. This approach is both rational from the point of view of engineering and allows the creation of long-lasting buildings. In some cases, the back wall of the houses rests directly on the soil layer. This wall not only performs a reference function but also plays the role of thermal insulation. The soil acts as a natural insulator and stabilizes the temperature of the interior space. As a result, houses remain relatively warm from the inside even in harsh winter conditions; energy consumption and heat loss are minimized.

Thus, structural solutions in mountain architecture are the result of traditional engineering practices adapted to the complex conditions of the terrain and ensuring both physical stability and energy efficiency. This approach has formed long-lasting, safe, and ecologically sustainable architectural examples of Azerbaijani mountain villages. In Azerbaijani mountain architecture, stepwise construction and planning according to the relief is not only a technical and constructive approach but also has a deep impact on the socio-spatial aspect. In mountain villages, the gradual placement of houses along the slope, the arrangement of streets and passages according to the relief line, not only ensures efficient use of land and stability; it also creates optimal conditions for organizing community life and strengthening social relations.

The dense and multi-level spatial structure increases solidarity within the community. The proximity of the houses to each other and the formation of the passage and yard functions on the roofs intensify the interaction between the neighbors. For example, in the village of Khinalig, the roof of the upper floor serves as both an open space and a daily communication space for the house located on the lower level. This allows



the villagers to carry out their daily activities without being far from each other, as well as the creation of a social control mechanism. The staggered construction also increases mutual security capabilities. Since most of the mountain villages are in harsh terrain and complex environmental conditions, community members can see each other visually; roads and roofs are connected to each other, allowing for quick response in the moment of danger. This system also ensures the safe movement of children, the elderly, and animals, and strengthens the collective protection mechanism within the community.

In addition, stepping up construction creates conditions for the formation of public and semi-public spaces. Rooftops, terraces, and hillside open spaces serve both private use and community activities. For example, during the winter months, roofs can be used for snow removal or partial animal housing, and during the summer months, they serve as outdoor meeting and gathering areas. These multi-functional spaces provide flexibility and continuity of community life and help preserve socio-cultural traditions. Thus, stepwise construction and tracing the relief line in Azerbaijani mountain architecture do not consist only of engineering and ecological principles. It is also an important indicator of socio-spatial organization, ensuring community solidarity, security, and cultural continuity. This traditional approach can also serve as an example for modern sustainable architectural concepts, as it combines the principles of harmony with nature, social integration, and economic efficiency.

3. Conclusion

The analysis of the data presented on Azerbaijani mountain architecture shows that construction in mountain villages is not only an aesthetic and functional approach, but also a complex integration of engineering, ecological, and social principles. The main results can be summarized as follows:

First, construction according to the terrain and the stepped (terracing) system are the main elements that ensure the stability of mountain villages. The houses are placed in steps along the slope, planned according to the relief line and built with minimal interference with the soil layer. This approach reduces the need for large excavations, minimizes the risk of landslides and erosion, and makes the construction process both technically and economically efficient.

Second, constructive solutions and engineering approaches ensure the longevity of houses in complex terrain conditions. Thick stone walls are used in the lower parts, and lighter materials are used in the upper floors. The back walls of some houses rest directly on the soil layer and perform the function of thermal insulation. This system maintains internal temperature stability in harsh winter conditions and improves energy efficiency. Third, the socio-spatial aspect is an important component of the tiered system and terrain-friendly planning. The multi-level and dense spatial structure increases solidarity within the community, expands the possibilities of mutual control and security, and creates conditions for the formation of public and semi-public spaces. An organically developed network of ancient roads, temporary pastures, shrines, and mosques reflects a sustainable eco-social system adapted to extreme environmental conditions. Examples such as Khinalig village show that the multifunctional use of roofs and terraces strengthens community life, ensures social integration, and helps preserve cultural traditions.

As a result, Azerbaijani mountain architecture is a harmonious combination of terrain-appropriate construction, constructive solutions, and socio-spatial principles. This architectural model not only provides engineering and environmental sustainability but is also important in terms of organizing community life and preserving cultural and household traditions. This traditional practice is a model for modern sustainable architectural concepts, as it combines harmony with nature, social integration, and economic efficiency. The main point to be emphasized is that mountain architecture is a bright example of a harmonious and sustainable living model created by man without conflicting with nature and adapting to its conditions.



Author's contribution

The sole author is responsible for conceptualizing, collecting, and analyzing data, and writing and editing the manuscript.

Conflict of Interest

The authors declare no conflicts of interest.

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Sacred and Revolutionary: Propaganda Analysis of South Korean and North Korean Online News Articles on Mount Paektu

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Abstract. Following North Korea's adoption of the "Two hostile states theory" in December 2023, the symbolic role of Mount Paektu—a core element of Korean national identity and former pro-unification rhetoric—requires re-examination. It remains unclear how propaganda in both Koreas constructs "Us vs. Them" narratives around this mountain after the ideological shift. This paper aims to compare two online news articles covering visits to Mount Paektu: one from North Korea's Rodong Sinmun (2026) and one from South Korea's Jogye Order Buddhist website (2024). The goal is to compare political rhetoric in a changed ideological environment. This is going to be achieved by identifying propaganda techniques used to construct Us vs. Them narratives. The Institute for Propaganda Analysis (IPA) method is applied, focusing on seven techniques (name calling, glittering generalities, transfer, testimonial, plain folks, card stacking, bandwagon). Four techniques appear: name calling, transfer, testimonial, and bandwagon. The North Korean text uses name calling and transfer to link journalists to the anti-Japanese struggle and the Kim dynasty's "eternal bloodline," creating an exclusively northern "Us." The South Korean text uses transfer ("peace pilgrimage"), testimonial, and bandwagon to emphasize inter-Korean and generational unity, even citing the pan-Korean hero Hong Beom Do, thus constructing a unifying, pan-Korean "Us." Both identify imperial Japan as "Them." Despite sharing the same genre and national symbol, the two texts employ propaganda techniques to produce diverging Us vs. Them narratives—one northern-exclusive, one pan-Korean—each aligning with its respective state's current official stance.

Keywords: *propaganda, Inter-Korean Relations, online news, Mount Paektu, Mountain Tourism*

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1. Introduction

Mount Paektu (Also spelled Mount Baekdu and called Mount Changbai when translated from Mandarin) is the tallest mountain on the Korean Peninsula and Manchuria, located at the border of the Democratic People's Republic of Korea (hereafter North Korea) and the People's Republic of China (hereafter China). Until recently, both North Korea and the Republic of Korea (hereafter South Korea) claimed the entire territory of the peninsula to be their sovereign territory. North Korea dropped its claim in late 2023. South Korea still claims the territory of North Korea, including the Korean side of Mount Paektu, while North Korea does not have identical claims against the South.

My previous analysis focused on the narrative present in both North and South Korean propaganda. Namely, the narrative of children in military conflicts. That analysis demonstrated how similar narratives are used elsewhere, such as in relation to the ongoing Russian invasion of Ukraine, and other conflicts historically. In contrast, this study focuses on an image more specific to the Korean Peninsula in particular:



Mount Paektu, which can be described as the very starting point of the Korean Peninsula, as it is situated in the very north of North Korea. This focuses the current paper on a less universal and more local image used in propaganda in Korea.

This analysis will compare two online news articles covering visits to Mount Paektu by South Korean pilgrims on the one side, and North Korean journalists on the other. One article was retrieved from the North Korean Rodong Sinmun website (Rodong Sinmun 2026), and the other from the South Korean Jogye Order of Korean Buddhism's National Community Promotion Headquarters website (Ministry of Unification 2026). The North Korean article titled "The Marching Group of the Journalists Union of Korea to the Revolutionary Battle Sites in the Mt. Paektu Area Departed" (조선기자동맹 백두산지구 혁명전적지답사행군대 출발) covers a ceremonial visit of Mount Paektu by journalists, while the South Korean article covers a pilgrimage of a South Korean religious group to it.

The two texts will be analyzed using the Institute for Propaganda Analysis method (hereafter the IPA method) to identify techniques of propaganda. The techniques used will compare the language of the two texts, allowing examination of in-text Us vs. Them narratives.

North Korean propaganda is well researched. Gabroussenko demonstrates how the image of South Korea within North Korean propaganda evolved until 2010 (Gabroussenko 2011). By comparing two texts, the current analysis will contribute to a clearer view of the evolving situation.

Andrei Lankov examined how South Korea targets North Korea through its propaganda. He describes the phenomenon as "war by other means", like the established term "hybrid warfare". He describes how South Korean messaging is projected at North Koreans. This is a policy that is more favored by right-wing South Korean governments, which refer to it as "psychological warfare (Lankov 2011). However, psychological warfare has both internal and external aspects, which are not clearly reflected in Lankov's paper. Consequently, this analysis will examine texts tailored to domestic audiences.

In recent decades, two events can be identified as breakthroughs in the field of propaganda analysis. One was the examination of propaganda used during the Rwandan Genocide (Yanagizawa-Drott 2014). The second has been the proliferation and popularization of LLMs (Liu et al. 2025). The study of the Rwandan Genocide case has sharpened our understanding of how propaganda spreads, while LLMs allow researchers to work with large data sets more efficiently. However, it is also crucial for media literacy to demonstrate how propaganda language can be identified, and how it can be done at the level of individual texts that readers can come across online. This is why the current analysis focuses on a comparison of the language of propaganda used in two texts.

2. Context

The South Korean article was published on September 2, 2024, while the North Korean article was published on March 19, 2026. These texts were published in the aftermath of a crucial event in the history of the Korean Peninsula: North Korea's adoption of the Two Hostile States theory (적대적 두 국가론) in December 2023. Since the inception of South and North Korea, the two states have continuously claimed, respectively, to be the only legitimate state on the Korean Peninsula, thus claiming the territory of the other as their own. However, with the adoption of the Two Hostile States theory, North Korea now recognizes South Korea as a separate and independent state. Moreover, South Korea has now been officially declared an enemy of the North Korean state. Additionally, this move caused the abolition and destruction of North Korean propaganda that promoted reunification with the southern counterpart. For instance, the iconic Arch of Reunification in Pyongyang was dismantled in January 2024. Meanwhile, South Korea continues to claim the North as its own territory, with the Ministry of Unification of the Republic of Korea still functioning as a part of the South Korean government.



Mount Paektu plays an important symbolic role in Korean identity and has been used in particular in pro-unification rhetoric. For instance, the September 2018 Inter-Korean Summit between the President of South Korea, Moon Jae-in, and the Supreme Leader of North Korea, Kim Jong Un was concluded with the two of them paying a visit to Mount Paektu. The photo of the two of them holding hands with the mountain peaks and the Heavenly Lake (a volcanic crater lake of Mount Paektu) in the background, and the two first ladies standing next to them, was spread in international media. In another photo, President Moon is seen filling a plastic bottle with water from the Heavenly Lake.

Moon was quoted as having told Kim, “Many people in the South would go to Mount Paektu from the China side, but I decided not to, pledging myself that I would go stepping on our soil.” A quote by Kim addressed to Moon reads, “The Chinese envy us because they can’t go down to the lake from their side, but we can <...> We should write another chapter of history between the North and the South by reflecting our new history on this Heaven Lake.” North Koreans greeted Moon at the airport next to the mountain, chanting “Motherland! Unification!” (Reuters 2018).

In addition to that, the mountainous landscape can also be seen on the wall image behind the two heads of state during the earlier April 2018 Inter-Korean Summit between the two sides, with them holding their hands up in the same way as they would later on Mount Paektu in one of the photos (Lee 2018). However, this occurred before the fundamental 2023 shift in North Korean rhetoric. Inter-Korean relations have been going back and forth (Lankov 2018). However, when it comes to the reunification rhetoric, it does not look like there is a way to backtrack on this issue anymore. Therefore, it is particularly interesting to catch a glimpse of the role of Mount Paektu in this recently changed ideological environment on the Korean Peninsula.

In North Korea, Mount Paektu is not exclusively used as a symbol of reunification. For instance, it can be found on the National Emblem, as described by Article 169 of the North Korean Constitution: “The national emblem of the Democratic People's Republic of Korea bears the design of a grand hydroelectric power station under Mt. Paektu, the sacred mountain of the revolution <...>” (Democratic People's Republic of Korea 2016).

Similarly, the first line of the South Korean national anthem also mentions Mount Paektu: “Until the East Sea's waters and Baekdu Mountain dry and wear away, May God protect and bless our country for ten thousand years” (National Anthem of the Republic of Korea).

It is important to note that North Korea is officially an Atheist state, and religious practices are strictly controlled by the state. The state sometimes promotes Chondoism in its propaganda, citing its “Rejection of West and Japan” (KCNA 2009). South Korea, in contrast, is a highly religiously diverse country with a wide variety of denominations and religious organizations. Like North Korea, religion in South Korea is frequently associated with Korean nationalism. For instance, the rhetoric of the Unification Church, which was recently banned in Japan (in relation to the issues that led to the assassination of the former Prime Minister Shinzo Abe), has been described as nationalistic (Tizzard 2026). Thus, national ideologies and religions are deeply intertwined in both North and South Korea, which is important to consider when analyzing propaganda coming out of the peninsula.

After the conclusion of the Korean War, South Korean tourists were first officially allowed to visit Mount Paektu from the Chinese side in 1992, as a result of the normalization of relations between South Korea and the PRC (Kristof 1992). In 2005, the Chairwoman of Hyundai Group, Hyun Jeong Eum, met Kim Jong Il. The agreement signed between the two included a clause that allowed South Korean tourists to visit the mountain from the North Korean side as well via charter tours (Seoul Reuters 2005). The 2007 summit between President Roh Moo Hyun and Kim Jong Il was concluded with the October 4 Declaration, which launched more regular direct flights for tourism purposes (Roh & Kim 2007). However, in 2008, a South Korean tourist was shot at Mount Kumgang, which led to tourist projects between the two countries

being suspended indefinitely (Jung 2008), thus leaving the PRC route as the only way for South Korean tourists to visit Mount Paektu. Recently, the PRC has eased visa restrictions to multiple countries, including South Korea, which allowed South Korean tourists to visit Mount Paektu from the Chinese side visa-free (Kim 2024). This is why the visit by the South Korean group was conducted via the Chinese side of the border.

3. Methodology

The Institute for Propaganda Analysis was an organization that existed in the US during the interwar period. In one of their publications, they outlined a method of identifying different propaganda techniques. The seven outlined techniques include name calling, glittering generalities, transfer, testimonial, plain folks, card stacking, and bandwagon. These techniques were discussed in a publication by the institute, in which they recommended the use of the seven techniques to analyze political speeches (Institute for Propaganda Analysis 1937).

In contrast, the current study uses the same methodology to comparatively analyze two pieces that belong to a different genre of text, nonexistent at the time of the institute's existence. Namely, the online news article genre. This genre is characterized by hybridity, meaning it can combine elements of various genres. For example, an online news article can contain extracts from a political speech. It is different from the more general genre of news articles in different ways, including the fact that it is able to incorporate more materials from different texts (for example, by including an entire video of a political speech, and not just quotes) due to not being limited by a physical format.



Figure 1. Soviet propaganda poster by Sakharov & Kuzginov 1950.

As suggested by the methodology outlined by the institute, the text is going to be analyzed to find the propaganda techniques. For example, a statement without evidence is going to be counted as an assertion and is going to be analyzed as such based on its respective position within the structure of its text. Analyzing these techniques within two texts will allow us to compare the ways in which they are used in North and South Korea.



Propaganda techniques can be used in each text to construct a Us vs Them narrative. For instance, a Soviet propaganda poster (Sakharov & Kuzginov 1950) does this rather explicitly by being divided into two parts, which are marked with the words “We” and “Them,” and uses the assertion technique of propaganda in combination with contrasting color schemes on both sides in order to portray a positive “Us” and a negative “Them”.

Two texts were chosen due to limitations of the current format. Further analysis of a larger sample of texts is advisable to deepen our understanding of propaganda on the Korean Peninsula. The two texts were chosen due to their shared characteristics, including the fact that they both belong to the same genre of text, and as online news articles, they both present coverage of visits to Mount Paektu, which is a national symbol of all Korean people, which is going to be explored further in the following chapter for context.

4. Results

This section goes through the propaganda techniques that were found in the two texts to compare how they construct Us vs Them narratives. The headline of an online news article is its most important move (Van Dijk 2013). This is the part of the text that most of the audience will see, as frequently, people don’t read the rest of the article after seeing it. This was true already with offline news articles, and it is also the case with online news articles, which tend to be spread on social media via hyperlinks, resulting in most consumers of texts in this genre only interacting with their headlines (and sometimes also subheadlines and the top images).

The abbreviation of the branch of the religious organization is deprived of religiosity. It is called Minchubon (민추본), which roughly translates as National Community Promotion Headquarters. The full name would have been Jogye Order of Korean Buddhism’s National Community Promotion Headquarters (민족공동체추진본부). Korean new religious movements have a strong tendency toward syncretism of religious beliefs with ideas associated with Korean nationalism. For instance, members of the Unification Church believe that Jesus Christ is going to come back as Korean, and the whole world is going to be speaking the Korean language.

Jogye Order of Korean Buddhism does have some syncretic tendencies, typical for Buddhism, as in some of its temples, one can find a Three Shrine Hall, dedicated to three indigenous Korean deities: Sanshin (Mountain God), Chilseong (Seven Stars), and Dokseong (the Recluse) (Jogye 2023). Beyond this religious syncretism, Korean Nationalism is realized in the order’s contemporary practices, as they have a pro-unification stance and have participated in restorations of Buddhist temples in North Korea.

The title of the North Korean article reads “Officials of the National Journalists’ Alliance visited revolutionary battle sites in the Mount Paektu region and held a pledge ceremony” (전국기자동맹일군들 백두산지구 혁명전적지를 답사, 맹세모임 진행). In this case, “revolutionary battle sides” is an example of the name-calling propaganda technique being used. However, in this case, it refers to actual battle sides in which the guerrilla Korean People’s Revolutionary Army (KPRA) fought against the Japanese Army.

Referring to the battle side as “revolutionary” is an important nuance. The author could have referred to the event as a “battle for independence”, for instance, as this was a part of the Korean independence movement, which included parties from all over the Korean peninsula fighting against the Empire of Japan. However, calling it “revolutionary” particularly distinguishes it as being associated with North Korea. The article does not mention the general concept of the Korean independence movement, as well as the fact that KPRA was heavily affiliated with the Soviet Army.

While no propaganda techniques were found in the headline of the South Korean article, its text consists of a series of slogans, which are typical of propaganda language. The third line in particular serves as an



emphasis of the common history of the Korean peninsula: “An anti-Japanese historical site and a sacred mountain of the nation” (“항일 유적지이자 민족의 성산서”).

This is a clear ideological contrast between the two articles. North Korean article uses propaganda language to highlight its role in fighting the Empire of Japan and omits the roles of southern affiliated organizations, as well as that of China. South Korean article emphasizes the common history of the Korean people in their fight for independence by using name-calling. Even though the South Korean article comes from a non-governmental source, both articles have their contents aligned with the official positions of South and North Korean states respectively, in which the first still has an official goal of reunification, while the latter has abandoned this goal.

Online news articles published on the Rodong Sinmun do not have clearly identifiable subheadlines and leads, which are typically distinguished with different fonts. It also lacks images, unlike its South Korean counterpart. Yet, it still follows some of the basic features of online news articles, such as a headline, date, author's name, and a link to a different article on the same website.

Notably, despite this lack of differentiation of specific moves, the text does use bold font for one purpose only: to highlight the names of Kim Il Sung, Kim Jong Il, and Kim Jong Un. The names of Kim Il Sung and Kim Jong Il are also highlighted by referring to them as “great leader comrade Kim Il Sung” and “great leader comrade Kim Jong Il”, while the latter is referred to as “respected comrade Kim Jong Un”. So, while the text is written in the genre of online news articles, some of its editing is close to propaganda pamphlets and posters, which also tend to highlight ideologically important terms and expressions.

The mention of the three Kims is particularly important in this text, due to its reference to “the eternal bloodline of the Juche revolution” (“주체혁명의 영원한 피줄기”). This bloodline is also known as the Kim dynasty internationally, and as the Paektu Bloodline (“백두혈통”) in North Korea.

The official North Korean historiography claims that Kim Jong Il was born at a secret camp located on Mount Paektu. However, scholars believe that he was born on the territory of the Soviet Union, either in Khabarovsk Krai (Avchenko 2019) or Primorsky Krai (Richardson 2016). The official North Korean narrative ties the Kim dynasty closely to Mount Paektu, while the currently analyzed North Korean text is an example of how North Korean media uses propaganda to reinforce this narrative.

South Korean text has more of the features of an online news article, including images with their descriptions provided. Most of the images use testimonial and bandwagon techniques of propaganda. They depict pilgrims seemingly enjoying their time at Mount Paektu and taking photos. The descriptions highlight this with some reading: “A lot of people on the mountain” (“백두산에 오르는 수많은 인파”), “Thousands of people are climbing up the stairs to see the sky” (“수많은 인파가 천지를 보기 위해 1400여 개 계단을 오르고 있다”).

Thus, the article can also be interpreted as an advertisement of religious tourism in the region, which is organized with the participation of the order. Testimonial and bandwagon techniques of propaganda tend to come in tandem, and they are also typically used in the language of advertisement. This differentiates the South Korean text as having more of a marketing goal, promoting a service, which is not found in the North Korean text, which is affiliated more exclusively with the North Korean state ideology.

Both religious texts, as well as advertisement texts, typically use language of propaganda. Thus, it is not surprising to come across propaganda techniques in such a text. North Korea is also well known for actively using propaganda in its media. Both texts actively use the transfer technique of propaganda. In the North Korean text: “The members of the expedition marching party, emulating the spirit of the anti-Japanese publishing workers, firmly wielded the brush and microphone of the revolution”



(“답사행군대원들은 항일의 출판일군들이 지냈던 정신세계를 본받아 혁명의 붓대와 마이크를 역세계”)

Here, the function of the transfer is to create a positive association between the members of the expedition and the anti-Japanese press of the Korean independence movement. It is further combined with the name-calling “brush and microphone of the revolution”, which strengthens this association. And in the South Korean text, the word “peace” (“평화”) is repeated 24 times throughout the text, including the headline, and twice in the lead, where it is most visible. For example, in the expression “peace pilgrimage” (“평화순례”). The goal here is to associate an act of religious tourism, and by extension, the Order, which organized the tour, with the positive notion of peace. In this case, peace is also associated with a particular notion of Korean nationalism, which favors reunification of the two Koreas. The example given above (“peace pilgrimage”) is a combination of both transfer and name-calling techniques of propaganda.

Thus, both texts use combinations of transfer and name-calling with a goal of creating a positive association that shows the pilgrims (in both cases) in a good light. However, the North Korean association is related to the past, with explicit references to the anti-Japanese struggle of the Korean liberation movement, while the South Korean association is tied to the idea of future peace.

The South Korean text also contains references to the anti-Japanese movement, but they are used differently in this case. It emphasizes the connection between generations of Korean people, as well as between North and South Koreans: “After passing through the anti-Japanese site of Seorin, the tears of the ancestors finally reached the holy mountain of Baekdu, the holy mountain of the people” (“선조들의 피눈물이 서린 항일 유적지를 지나, 마침내 민족 성산인 백두산에 닿았다.”)

This quote emphasizes the connection of the religious tour with the Korean ancestors who fought against the Empire of Japan. The following quote is related to the connection between North and South Koreans: “It is also an anti-Japanese site of our ancestors and a place that symbolizes the pain of a divided homeland. In the area of Baekdusan, many anti-Japanese warriors fought against the Japanese, starting with the medics of Hong Beom Do and the medics.” (“선조들의 항일 유적지이자 분단된 조국의 아픔을 상징하는 장소이기도 하다. 백두산 일대는 구한말 홍범도 의병대를 시작으로 해방까지 수많은 항일 전사들이 일제와 맞서 싸웠다.”)

Hong Beom Do is a national hero of all Korean people (North Koreans, South Koreans, and Central Asian Koreans), who opposed the Empire of Japan. He was born in Chasong County prior to the partition of Korea, located in the very north of Korea. However, in South Korea, his legacy is politically controversial, between the right wing and the left wing, due to his ties to communists. For instance, during the presidency of right-wing Yoon Suk Yeol, it was announced that Hong Beom Do’s bust that was erected in the Korean Military Academy back in 2018 would be removed. This decision was criticized by the South Korean nationalist left wing (The Economist 2023).

Thus, the South Korean article highlights the ties between generations by referencing a national hero of both Koreas, despite his legacy being controversial in the South. Because it is acting as an advertisement for the tour, the South Korean article also contains a series of testimonials, consisting of quotes from some of the participants of the tour, with their names and ages. It is particularly notable that the article also used the same combination of bandwagon and assertion two times, about the age of the participants: “an unusual time when all ages from the 10s to the 70s were together” (“10대부터 70대까지 전 연령이 고루 함께했던



이례적인 시간이었다”). These two assertions contrast with the photos, where most of the participants are elderly people.

The goal here is to portray the pilgrimage as being attended by all kinds of people, to make it more attractive. However, it is counterproductive when contrasted with the photos.

Thus, a total of four kinds of propaganda techniques were identified in the two texts, including name-calling, transfer, testimonial, and bandwagon. And while the topics of the texts were similar, and both belong to the same genre of text, the techniques were used there to push for different narratives. Both narratives that are being pushed by the two texts align respectively with the current official stances of North and South Korea, even though the South Korean text comes from a non-governmental source.

5. Conclusion

This paper compared two texts, both belonging to the online news article genre, covering visits to Mount Paektu, which plays an important symbolic role for both North and South Korea. This site has served both as a symbolic background and a subject of agreements between the two sides, highlighting its importance for inter-Korean relations. South Koreans used to have the right to visit the mountain as tourists under previously existing agreements with the North. Nowadays, they are only allowed to visit the mountain through the Chinese side of the border.

As a result, when covering such a common symbolic denominator for all Korean people, such as Mount Paektu, both North Korean state media and South Korean religious media use propaganda techniques to push narratives that are different in various ways. In the North Korean case, name-calling and transfer techniques have been used to establish a connection between the anti-Japanese struggle and North Korean journalists today, with an emphasis on the revolutionary nature of the fight against the Empire of Japan. It further connects the event with the ruling Kim dynasty by referring to “the eternal bloodline of the Juche revolution”. Thus, this text is a product of what could be called North Korean nationalism, as it connects the historical precedent of animosity with Japan to exclusively North Korean narratives.

The South Korean text uses propaganda techniques, such as name-calling and transfer, to emphasize the connection between the Korean people. Both generational connections, when it talks about the anti-Japanese struggle, it emphasizes the role of the ancestors, without any further ideological specifications linked exclusively to either North or South. Moreover, it uses the name Hong Beom Do, which can be seen as a unifying historical figure for all Korean people.

The difference between the Us vs Them narratives pushed by the two texts is the “Us” part. While them is the Empire of Japan in both texts, the “Us” in the North Korean text is identifiably exclusively northern, while the South Korean text is pushing for a unifying figure of “Us” that is neither exclusively southern nor exclusively northern. More research is needed to continue capturing the evolving ideological situation on the Korean peninsula.

Author's contribution

The sole author is responsible for conceptualizing, collecting, and analyzing data, and writing and editing the manuscript.

Conflict of Interest

The authors declare no conflicts of interest.

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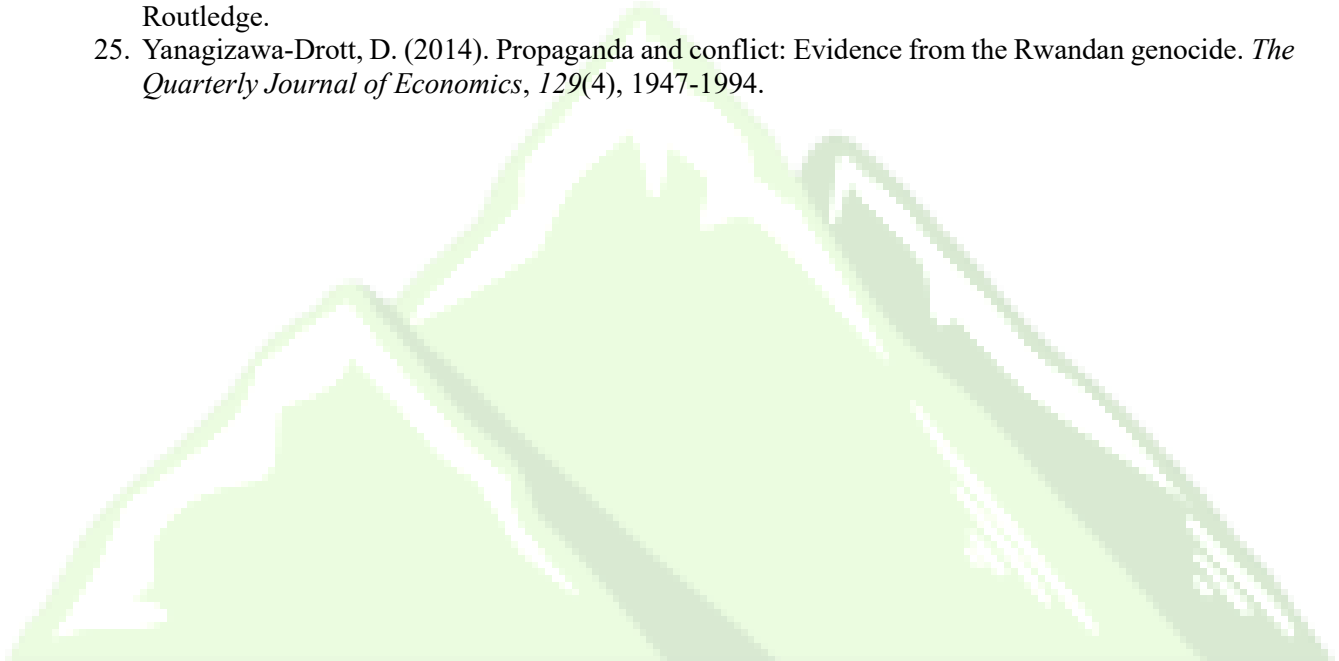
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