

## Dzud and Natural Disasters in Kazakh Epic as a Unique Adaptation Tool

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### ABSTRACT

This article systematically examines the depiction of natural disasters in traditional Kazakh epic poetry and analyzes their role in nomadic adaptation strategies. The research draws upon major epic cycles such as "Kobylandy Batyr" (29 versions), "Er Targyn", "Alpamys Batyr", "Kambar Batyr", and "Edige Batyr" analyzing the mythological, symbolic, and practical dimensions of drought, aridity, floods, and other natural disasters. The Kazakh epic tradition transforms natural disasters into multifaceted narrative and cultural tools: they test heroic characters, mark cosmic transitions, strengthen social solidarity, and encode ecological knowledge for nomadic societies. Through textual analysis, ethnographic contextualization, and comparative methodology, the article demonstrates that natural disaster motifs in Kazakh epic represent a complex cultural mechanism for processing collective trauma, preserving ecological memory, and transmitting survival strategies across generations. The dzud phenomenon — the most dangerous natural disaster in nomadic Eurasia — occupies a central place in epics and serves as a marker of the heroic ideal, community stability, and humanity's capacity to resist natural forces. The 2023-2025 dzud phenomenon in Mongolia, which caused 8.1 million livestock deaths, gives new significance to studying adaptation strategies in epics and opens possibilities for integrating traditional ecological knowledge into contemporary sustainability discourse.

**Keywords:** Kazakh Epic Poetry, Dzud, Natural Disasters, Oral Tradition, Ecological Memory, Nomadic Culture, Adaptation Strategies, Climate Sustainability, Central Asian Literature, Cultural Anthropology, Folklore And Climate

### INTRODUCTION: EPIC, ECOLOGY, AND CULTURAL MEMORY

The Kazakh people's epic heritage is a rich treasury of historical experience, worldview, and knowledge of interaction with nature accumulated over millennia. Nomadic life made the Kazakh people directly dependent on natural conditions; therefore, natural phenomena, including disasters, occupied an important place in epic works (Toibazar et al., 2025). For the Kazakh people living on the vast steppe, natural disasters were not merely dangerous phenomena, but also important elements of mythological thought, worldview concepts, and cultural memory.

Kazakh heroic epic is a valued example of world folklore. The "Kobylandy Batyr" epic, recorded in 29 versions (Pangereyev et al., 2020; Nurmaganbetova, 1984), along with works such as "Alpamys Batyr", "Er Targyn", "Kambar Batyr" and "Edige Batyr" preserve the historical memory, spirituality, and wisdom of the Kazakh people for living in harmony with nature. In these epics, natural disasters — dzud, drought, floods, storms — are not merely background, but appear as forces that determine heroic destiny and structure social relations. The main models of Kazakh heroic epic are presented in Table 1.

**Table 1.** Main Models of Kazakh Heroic Epic

Epic Title	Number of Recorded Versions	Tribe of the Hero	Major Researchers	Source
Kobylandy Batyr	29	Karaqypshaq	M. Auezov, O. Nurmagambetova, A. Konyratbaev	Pangereyev et al., 2020
Alpamys Batyr	Multiple versions	Konyrat	M. Gabdullin, K. Zhumaliyev	Zhumaliyev, K. (1958)
Ep Тарғын	Multiple versions	Nogay	M. Auezov, T. Syzdykov	Auezov, M.O. (1961)
Kambar Batyr	Multiple versions	Kerey	A. Konyratbaev	Konyratbaev A. (1975)
Edige Batyr	Multiple versions	Various tribes	M. Gabdullin	Gabdullin, M. (1958)

The research relevance is determined by several factors. First, in the context of contemporary climate change, studying adaptation strategies to natural disasters in traditional cultures becomes scientifically and practically significant. The 2023-2024 dzud in Mongolia caused the death of 8.1 million livestock (National Statistical Office of Mongolia, 2024; OCHA, 2024), while similar climate risks persist in Kazakhstan (Batima et al., 2005). Second, research conducted at the intersection of folkloristics and ecological anthropology opens possibilities for integrating Traditional Ecological Knowledge (TEK) into contemporary sustainability discourse (Berkes et al., 2000; Huntington, 2000). Third, the depiction of natural disasters in Kazakh epic has not been sufficiently studied, and this topic requires new theoretical and methodological approaches.

The research goal is to systematically analyze the depiction of natural disasters in Kazakh heroic epic and determine their role in forming nomadic adaptation strategies. To achieve this goal, the following tasks were set: (1) classify and describe natural disaster motifs in epics; (2) analyze the place of the dzud phenomenon in epic narrative; (3) study mythological and symbolic interpretations of natural disasters; (4) identify narrative functions of natural disasters in epics; (5) compare Kazakh epic with other Turko-Mongolic epics; (6) evaluate contemporary significance of epic adaptation strategies.

The research methodology combines three main approaches. First, textual analysis was used to identify natural disaster motifs in epic works and describe their poetic characteristics. Second, ethnographic contextualization made it possible to place epic images within specific historical-cultural conditions. Third, the comparative method helped compare Kazakh epic with epics of other Turko-Mongolic peoples and identify general patterns and specific characteristics. The research also relies on ecological anthropology (memory theory and narrative analysis).

## LITERATURE REVIEW AND THEORETICAL FOUNDATIONS

The history of Kazakh epic research dates to the early twentieth century. Early systematic studies were conducted by scholars such as M. Auezov (Auezov, 1961), A. Margulan (Margulan, 1985), M. Gabdullin (Gabdullin, 1958), and K. Zhumaliyev (Zhumaliyev, 1958), who studied the historicity, poetics, and ethnic aspects of epics. During the Soviet period, O. Nurmagambetova (1984) conducted a comparative typological study of the "Kobylandy Batyr" epic, while A. Konyratbaev published a major work on the ethnic character of Kazakh epic (Konyratbaev, 1968).

In Western scholarship, the foundation for studying Turkic epics was laid by Chadwick, N.K. & Zhirmunsky, V. (1969). Their work "Oral Epics of Central Asia" became a classic in comparative study of Central Asian epics. Reichl (2000, 2016) comprehensively analyzed the forms and structures of Turkic oral epic poetry, revealing the musical and poetic characteristics of epic narrative. His works made it possible to consider Kazakh epic in a broader Eurasian context.

Direct studies on the depiction of natural disasters in epics are scarce. However, important works exist in the field of ecological anthropology. Crate and Nuttall address issues at the intersection of anthropology and climate change (Crate & Nuttall, 2016), analyzing adaptation strategies of traditional cultures. Oliver-Smith and Hoffman propose new approaches to studying disasters from an anthropological perspective (Oliver-Smith & Hoffman, 2020).

In studying the dzud phenomenon, the works of Fernandez-Gimenez et al., (2012); Tachiiri et al., (2008); Begzsuren et al., (2004) are important. They examined the climatic characteristics of dzud, socio-economic consequences, and impacts on pastoralism. UNICEF (2024) and UNDP Mongolia (2024) reports on the 2023-2024 dzud in Mongolia demonstrate the contemporary relevance of this phenomenon.

From a climate history perspective, Cameron, 2018 studied famine and violence in Kazakhstan, while Middleton et al., 2015 examined spatial variations in climate hazards in western Mongolia. These works help understand the socio-political consequences of natural disasters.

## DZUD — The Most Dangerous Disaster of Nomadic Civilization

The most frequently occurring and most terrible natural disaster depicted in Kazakh epic is dzud. The term dzud is a collective name for the most severe winter conditions threatening nomads. During dzud, livestock die en masse, people face starvation, and the socio-economic system collapses. Historical records (Cameron, 2018) show that dzud repeatedly occurred on the Kazakh steppe and greatly affected the population.

Ethnographic records show that Kazakhs divided dzud into various types. Different types of dzud have been identified in Kazakh tradition, and their characteristics are presented in Table 2. White dzud occurs when deep snow cover (20-60 cm) falls, preventing livestock from reaching grass. Black dzud is characterized by snow-free, severe frost that causes livestock to die from cold. Brown dzud results from summer drought combined with winter, leading to fodder shortage and livestock death. Kazakh proverbs contain the expression "Dzud has seven brothers," meaning seven types of natural conditions leading to dzud have been identified.

**Table 2.** Types of Dzud in Kazakh Tradition

Type of Dzud	Kazakh Name	Climatic Conditions	Consequences
White dzud	White dzud	Deep snow cover (20-60 cm)	Livestock cannot reach grass
Black dzud	Black dzud	Snow-free, severe frost	Livestock dies from cold
Brown dzud	Brown dzud	Summer drought + winter	Fodder shortage, livestock death
Bare dzud	Bare dzud	Dry summer, frosty winter	Food shortage

*Note: Table compiled based on ethnographic records and contemporary climate research.*

The dzud motif plays a significant role in Turko-Mongolic epics. Reichl (2000), analyzing the depiction of natural phenomena in epics of Kazakhs and other Turkic peoples (Zhirmunsky, 1974), shows their place in narrative structure. In epics, dzud performs several functions: creates a realistic background, becomes a determiner of hero's fate, and serves as a marker of epic time.

In Kazakh epic, dzud often becomes the trigger for the hero's heroic deeds. In many versions of the "Kobylandy Batyr" epic, when dzud brings disaster to the people, the hero goes on a campaign against enemies to save his people. This motif reflects the specific experience of nomadic society: during dzud, people were forced to seek help from neighboring tribes or relocate to warmer lands.

The use of the dzud motif in epics is a manifestation of the nomadic community's ecological memory (Berkes, 2018). Through epics, younger generations learned about the dangers of dzud and methods to mitigate its consequences, as well as acquiring skills to maintain stability in difficult situations. Humphrey & Sneath, 1999, studying nomadic adaptation strategies to dzud, emphasized the importance of traditional knowledge.

The 2023-2024 dzud in Mongolia clearly demonstrated contemporary nomadic sustainability problems. According to a UNICEF Mongolia, 2024 report, more than 80,000 children faced difficulties in education, and 220,000 herding families needed assistance. National Statistical Office of Mongolia, 2024 confirmed the multifaceted impact of dzud (OCHA, 2024): economic losses, disruption of food security, displacement, interruption of education processes, and increased risks of gender-based violence. Dzud led to a 25% decline in Mongolia's agricultural GDP growth in the first nine months of 2024 (UNDP Mongolia, 2025).

Analysis of epic formulas and linguistic structures helps understand the poetic depiction of natural disasters. Kazakh epic uses special formulas when depicting dzud: "A year of dzud came", "The pressure of severe winter", "Livestock could not reach yellow grass". These formulas are stable elements of epic tradition and convey to the audience the severity of the situation.

In the "Er Targyn" epic, the motif of severe winter is used as a test for the hero. Er Targyn, fleeing from enemies, is forced to travel through mountains in severe cold. Snow, frost, and storms all test the hero's strength. In these episodes, nature plays a double role: it protects the hero (enemies cannot pursue him) and simultaneously tests him. Only a true hero can overcome nature's forces.

In the "Alpamys Batyr" epic, natural disasters perform a different function. At the beginning of the epic, there is a prolonged drought in Baybori's domain. This drought is understood as a symbol of childlessness. Nature's stagnation — a sign of barrenness and stagnation of life. Alpamys's birth coincides with the end of the drought. This represents the symbolism of life's renewal, restoration of order.

In the version recited by the renowned bard Muryn zhyrau, the dzud theme appears differently. Here, dzud is the result of an enemy's curse, meaning the natural disaster is closely connected with mythological understandings. Toktarbai, Alpamys's father, suffers a curse, as a result of which dzud begins in the land. Kobylandy performs heroic deeds to lift this curse. This version demonstrates the mythological interpretation of dzud.

In versions of the "Kobylandy Batyr" epic, the use of the dzud motif shows various variations. When the people's livestock die and famine begins, Kobylandy goes to seek help from the Kalmyk khan. This episode reflects actual historical experience: during dzud, Kazakh tribes were forced to form alliances with neighboring peoples.

These contemporary records validate the authenticity of dzud depictions in epics and demonstrate the importance of studying traditional adaptation strategies. Fernandez-Gimenez et al., 2012, studying dzud adaptation and resilience in Mongolia, emphasize the need to synthesize traditional knowledge with contemporary methods.

### **Geographic Aspects of Natural Disasters**

Natural disasters in Kazakh epic are closely connected with geographic context. The landscape of the Kazakh steppe — vast plains, mountains, rivers, semi-desert areas — forms the framework of epic narrative. Different geographic regions face different natural hazards. Northern regions experience severe winters and deep snow cover, while southern regions face drought as a major problem.

Geographic names frequently appear in epics: Altai, Jetisu, Syrdarya, Edil (Volga), Zhaiyk (Ural). These names not only mark space but also provide information about natural conditions. For example, the Altai region is known for severe winters, while Jetisu is distinguished by relatively mild climate. Epic characters use this geographic knowledge: during dzud, they migrate to areas with milder climate.

Rivers and lakes play important roles in epics. They are not only water sources but also borders, barriers, and sacred places. During floods, rivers become major challenges for heroes. For example, in "Kobylandy Batyr" crossing a flooded river demonstrates the hero's exceptional strength. Crossing a river represents transition between worlds, movement from good to bad or vice versa.

Mountains occupy a special place in epic geography. Mountains are difficult obstacles, defensive positions, and sacred spaces. Winter conditions in mountains are particularly severe: severe frost, blizzards, avalanches. Epic heroes often must cross mountains, and natural elements test their strength. In the "Er Targyn" epic, the hero's journey through mountains in winter demonstrates his endurance and patience.

### **Seasonal Cycles and Natural Rhythms**

Seasonal cycles in Kazakh epic are important elements that structure epic time. Nomadic life was closely connected with seasonal migration: winter camps, summer camps, autumn camps, spring camps. Each season had its own risks and opportunities. Winter was the most dangerous period, as the risk of dzud was highest. Spring — a renewal time, but sudden snow or frost could threaten newborn animals.

Summer — a season when livestock fattened and people gathered strength. But summer drought increases the risk of the following winter's dzud. Autumn — a preparation period before winter. Epic heroes often set out on campaigns in autumn, as this season was suitable for travel.

Living in harmony with natural rhythms was an important part of nomadic wisdom. Epics taught audiences to observe seasonal changes, understand natural signs, and act appropriately at different times of year. Natural disasters are often associated with disruption of seasonal rhythms — unseasonable drought, late frost, or early winter. These disruptions are understood in epics as signs of cosmic order disturbance.

### **Other Natural Disasters in Kazakh Epic**

After dzud, the second important natural disaster motif is drought and water shortage. The continental climate of the Kazakh steppe was characterized by long dry periods. Water shortage posed a direct threat to pastoralism and human life. The drought motif in epics is closely connected with mythological understandings. Water — as the basic element of life — has sacred meaning in many mythological systems.

In Kazakh worldview, water represents nature's blessing. The absence or insufficiency of water indicates cosmic order disturbance, the strengthening of chaos. The hero acts as a restorer of order. Drought and water shortage motifs reflect not only mythological concepts but also actual conflicts between tribes over access to water sources and pastures.

Floods and sudden changes in river beds are rare in epics, but their presence is very meaningful. Floods in epics are usually used as passages or obstacles. Overcoming a flooded river demonstrates the hero's special strength and divine support. Motifs connected with water elements in Kazakh epic are closely linked with mythological plots. Characters such as the underwater king, water fairy, and water spirit embody the power of water element and its dual nature — life-giving and destructive.

Storm, strong wind, and other atmospheric phenomena are frequently encountered in Kazakh epic. On the vast steppe, wind possesses special power. In epics, storms often coincide with heroes' attacks on enemies, showing nature's support for the hero. In Kazakh worldview, wind may be a manifestation of spirits or ancestors. A sudden storm is a sign from the spiritual world. Lightning — God's weapon, manifestation of divine power.

### Case Analysis: The Dzud Episode in "Kobylandy Batyr"

Analysis of dzud episodes in various versions of the "Kobylandy Batyr" epic helps understand the role and functions of natural disasters in epic narrative. The episode begins with a severe winter descending on the Karaqypshaq land, with snow depth preventing livestock from reaching grass. The episode begins with describing the severity of the situation: "The sky fills with clouds of blizzard // The earth is covered with snow // Livestock cannot reach grass // People suffer hardship."

This episode shows the social consequences of dzud. People face starvation, social hierarchy changes, and unity and cooperation become important. Kobylandy becomes the hope of his people. He goes to seek help from the Kalmyk khan, showing an important aspect of nomadic diplomacy. During dzud, inter-tribal alliances were formed, marriage ties established, and military support sought.

In the version of renowned bard Muryn zhyrau, the dzud motif appears differently. Here dzud is not merely a natural climatic phenomenon but also the consequence of a mythological curse. Toktarbai suffers a curse, as a result of which dzud begins in the land. To lift the curse, heroic deeds are necessary. Thus, dzud becomes the driving force of the heroic plot.

In Zhamantai zhyrau's version, the dzud episode contains social criticism. The cause of dzud is the negligence and lack of concern of the wealthy. This version shows the connection between social injustice and natural disasters. The hero struggles not only with nature but also with social injustice.

### Landscape, Ecosystems, and Climatic Zones

The landscape diversity of the Kazakh steppe is reflected in epics. Northern regions — forested and forest-steppe zones — are characterized by severe winters. In these regions, snow depth is significant, temperatures drop very low, and the risk of dzud is high. In epics, journeys to northern regions during winter are depicted as very dangerous undertakings. The "Er Targyn" epic shows the hero's winter journey to the north demonstrating his exceptional heroism.

Central Kazakhstan — the steppe zone — is the main setting of epic action. This region experiences a continental climate: severe winters and hot summers, with drought risks. In epics, the climatic characteristics of central steppe are depicted in detail: summer heat, water scarcity, winter blizzards. Heroes learn to survive in these conditions, read natural signs, and overcome difficulties.

Southern Kazakhstan — semi-desert and desert regions — is characterized by drought and water shortage. In epics, journeys to southern regions are connected with seeking water sources. Oases — green islands in the desert — occupy important places in epic geography. In the "Alpamys Batyr" epic, the relatively mild climate of Jetisu and abundant water conditions are shown. This region is a target for migration during dzud.

Mountainous regions — Altai, Tian-Shan, Junggar Alatau — occupy special places in epics. Mountains are concentrations of natural forces. Mountain climate is extremely changeable: sudden storms, avalanches, severe frost. In epics, heroes are frequently tested in mountains. Overcoming mountains is the hero's greatest achievement. Episodes of crossing mountains in "Kobylandy Batyr" demonstrate the hero's endurance and patience.

Rivers and lakes are important elements of epic landscape. Major rivers — Syrdarya, Edil, Zhayyk — are not merely water sources but also borders, political and cultural divisions. Crossing a river represents symbolism of transition to another world, movement from good to bad or vice versa. Lakes — Balkhash, Aral — have mythological significance. There is a kingdom under the lake, the lake spirit rules human fate. These mythological characters show the vital importance of water resources.

### Mythological Interpretation of Natural Disasters

In Kazakh epic, natural disasters are understood not only as physical phenomena but also as events with mythological and cosmological significance. This interpretation operates at several levels. At the first level, natural disasters are understood as manifestations of divine justice. Dzud, drought, or other disasters are punishments for human sins, injustice, or breaking taboos. At the second level, natural disasters are understood as manifestations of eternal struggle between chaos and order. In Old Turkic and Kazakh cosmology, the world must maintain constant balance. Natural disasters indicate disruption of this balance. The hero is the force that restores cosmic order, fights against chaos. At the third level, natural disasters are signs of transitional periods, turning points in eras. The fall of the old world and birth of the new coincide with disasters.

In Kazakh worldview, shamanistic concepts and Islamic traditions exist in syncretistic form (Margulan, 1985). In shamanistic tradition, natural disasters result from the interference of the spiritual world. Spirits and nature spirits respond to human actions. In Islamic tradition, disasters are understood as manifestations of God's will. However, in epics, these two traditions are not always clearly separated; they complement each other.

Star eclipses, moon eclipses, sun eclipses — celestial phenomena in epics are signs of major events. These phenomena are usually connected with hero births, major wars, or changes of state. Celestial phenomena show the cosmic significance of earthly events.

Livestock death, in epics, is depicted not only as economic disaster but also as spiritual crisis. Livestock is wealth, life, blessing. Livestock death is disruption of world order. During dzud, livestock death is understood as consequence of human sins. The hero restores world order through recovering livestock or acquiring new livestock.

Drought is the stagnation of life, freezing of time. Water is the source of life, and water's absence is death sign. Water-seeking motif is frequently encountered in epics and is an important part of hero's heroic path. Finding water is restoring life, rescuing people. Lightning is God's weapon. Lightning strike is higher forces' intervention. Lightning hits the wicked (enemy, tyrant), and protects the hero.

Natural disaster symbolic codes in Kazakh epic form a complex meaningful system. Snow is pure covering, and also an obstacle. White snow is God's blessing, but excessive snow is a curse. Frost is trial, purification. The hero demonstrates spiritual strength by overcoming frost. Storm is divine wrath or divine help. Storm's direction matters: if the storm is against enemies, it is hero's divine support.

### **Community Stability and Social Solidarity**

Natural disasters in epics appear as forces that shape social relations. During dzud, community unity becomes a matter of life and death. After dzud, manifestations of social solidarity are frequently encountered in epics. The wealthy help the poor, neighboring tribes support each other, and heroes perform heroic deeds for the people's benefit.

In the "Kobylandy Batyr" epic, the hero's efforts to save his people during dzud exemplify the ideal of social leadership with responsibility. The hero not only defeats enemies but also ensures the people's living needs. This shows the connection between power and responsibility in nomadic society — a true leader is one who can rescue his people during catastrophe.

Epics also depict changes in social stratification during natural disasters. Social hierarchy changes during dzud; the wealthy may become poor, and wise and strong people may become leaders. This social mobility demonstrates the flexibility of nomadic society. During catastrophes, important is not wealth but ability, heroism, and wisdom.

Inter-tribal relations also change with natural disasters. During dzud, alliances are formed, contradictions are resolved or conversely conflicts arise. Epics frequently depict diplomatic missions, marriage alliances, and military cooperation during natural disasters. This reflects actual historical experience: Kazakh tribes used complex diplomatic strategies during natural disasters.

### **Gender Dimensions and Women's Roles**

Gender role divisions during natural disasters are depicted interestingly in Kazakh epic. Men are heroes, livestock protectors, and seekers of new pastures. But women's roles are also very important. In epics, women appear as protectors of family, food preparers, and child protectors during catastrophes. The "Forty Girls" epic shows girls' heroism during dzud in protecting their people.

The image of the wise woman is frequently encountered in epics. The hero's wife or mother warns about natural disasters in advance, gives advice, and does not discourage from the path. In "Alpamys Batyr" Gulbarshin helps the hero in difficult situations and ensures his survival. This shows women's practical wisdom and their role in maintaining stability.

The 2024 dzud in Mongolia report emphasized increased gender-based violence risks (OCHA, 2024). This contemporary issue gives new perspective to studying women's vulnerable situations in epics. In epics, women are often left unprotected during dzud, but they also employ survival strategies: use community networks, manage resources efficiently, protect children.

### **Psychological Consequences of Natural Disasters**

Epics also depict psychological effects of natural disasters. Fear during dzud, loss of hope, despair — all constitute the emotional state of epic characters. But epics convey messages of hope and stability. The hero is a person who does not fear in difficult situations, does not lose hope, and gives confidence to his people.

Collective trauma and its overcoming is an important topic in epics. After dzud, people must recover: restore livestock, rebuild economy, strengthen social structures. Epics depict this recovery process and offer examples to audiences. The hero's victory is not only physical but also psychological victory.

Collective memory about natural disasters is preserved. Epics are the mechanism through which these memories are transmitted across generations. Stories about "great dzud" teach caution, demand preparation, but do not cause fear. Epic narrative transforms catastrophe into part of the past, wisdom's source.

## Economic Consequences and Resource Management

Economic consequences of natural disasters are directly and indirectly depicted in epics. Dzud is not only wealth loss but also loss of life foundation. In nomadic society, livestock is currency, food, clothing, transport. Livestock loss means many years of poverty. Epics depict economic recovery process after dzud: heroes go on campaigns and acquire spoils, the poor work for the wealthy, tribes seek help from neighbors.

Resource management strategies are important in epics. A wise hero prepares for dzud in advance: collects fodder, controls livestock numbers, accumulates reserves (Sneath, 2000; Kreutzmann, 2012). Cameron, 2018, studying famine in Kazakhstan, showed tragic consequences of disruption of traditional resource management systems. Epics preserve this traditional knowledge: how to control livestock numbers, how to use pastures, how to prepare for winter.

## Narrative Functions of Natural Disasters in Epic Time and Space

Natural disasters perform important functions in the structure of Kazakh epic narrative. They structure epic time and space. In time dimension, natural disasters are used as boundary markers. "The year of great dzud," "during severe drought" — these formulas mark epic time. Natural disasters divide epic plot into periods and determine narrative rhythm. Natural disasters are boundary markers in the structure of epic narrative. They are not merely background but plot-driving forces. After dzud, the hero goes on a campaign to save his people, during drought seeks new pastures, and by overcoming storm defeats enemies. In spatial dimension, natural disasters describe areas and determine boundaries. "Dzud-devoured land," "dry steppe," "flooded river" — these toponyms qualitatively describe space (Table 3).

**Table 3.** Narrative Functions of Natural Disasters

Function	Description	Examples	Source
Plot Catalyst	Disaster triggers hero's action	Hero goes on campaign after dzud	Reichl, 2000
Hero's Test	Disaster tests hero's strength	Endurance in storm, severe cold	Chadwick & Zhirmunsky, 1969
Time Marker	Disaster marks epic time	"The year of great dzud"	Reichl, 2016
Space Boundary	Disaster characterizes dangerous areas	Flooded river - boundary between worlds	Nurmaganbetova, 1984
Moral Punishment	Disaster is punishment for injustice	Dzud begins in tyrant's land	Epic narratives

*Note: Table compiled based on epic texts analysis.*

Natural disasters become turning points in epic characters' fate. Disasters are not merely background but plot-driving forces. The hero, after dzud brings disaster to the people, goes on a campaign to save his people, seeks new pastures during drought, overcomes floods to reach enemies. In spatial dimension, natural disasters describe regions and determine boundaries. "Dzud-affected land," "dry steppe," "flooded river" — these terms qualitatively characterize space.

## Epic Formulas and Natural Disasters

The distinctive stylistic characteristics of Kazakh epic poetry are clearly evident in depicting natural disasters. Epic formulas are stable poetic phrases that aid memorization and transmission of text in oral tradition and emphasize the regular use of certain formulas. When depicting dzud, Kazakh epic uses stable formulas: "White snow fell covering the earth", "Black livestock perished", "The year of dzud came to the people", "The pressure of winter began".

Epithets strengthen the terrifying nature of natural disasters. "Merciless winter", "Black dzud", "Red storm", "White blizzard" — these epithets show the severity of disasters. Comparisons are widely used: "Dzud came like a wolf to the people", "Frost hard as iron", "Storm attacked like an enemy". These comparisons equate natural elements with wolves and enemies, showing their dangerousness.

Parallelism — another important tool of epic poetry. For example: "Dzud took livestock // Enemy took life". This parallelism equates dzud and enemy, showing both are dangerous. Repetitions strengthen emotional effect: "The people starved, starved // Livestock died, died greatly".

Meter and rhythm are important in depicting natural disasters. Dzud episodes are usually told in slow, heavy meter. This shows the prolonged nature of disasters and their severity. Conversely, storm episodes are told in fast, dynamic meter. This depicts the suddenness and power of the element.

## Epic Performance and Musical Support

Kazakh epics are not only spoken but accompanied by music on the kobyz or dombra (Reichl, 2000). When depicting natural disasters, bards use special musical techniques. Dzud episodes are told in low, heavy tones and slow tempo. This conveys the tragic nature of catastrophe.

In storm or blizzard episodes, music becomes dynamic. Bards use fast rhythm, high register. On the kobyz or dombra, bards imitate storm sounds. This places audiences in the middle of the storm; they hear and feel the blizzard.

The interaction between performer and audience is important. When bards depict disasters, the audience responds emotionally: cries, quiets, becomes afraid. This interaction transforms epic experience into collective event. Stories about natural disasters are not merely memory of the past but a way to process contemporary experience.

## Comparative Perspective: Comparison with other Epic Traditions

Comparing natural disaster depictions in Kazakh epic with other epic traditions reveals interesting parallels and differences. Natural disasters play important roles in epics of Turkic peoples (Kyrgyz, Altai, Turkmen). In the "Manas" epic, dzud and drought motifs appear as causes for heroic deeds, similar to Kazakh epic. This shows that Turko-Mongolic peoples experienced similar ecological conditions and used similar cultural codes (Table 4).

**Table 4.** Comparative Depiction of Natural Disasters in Turkic Epics

Epic	Dzud	Drought	Floods	Storms/Blizzard	Religious Interpretation
Kazakh Epic	Frequent, main disaster	Important motif	Rare	Frequently depicted	Islam + Shamanism
Kyrgyz Epic ("Manas")	Occurs	Occurs	Occurs	Frequent	Shamanism + Islam
Mongolian Epic	Very important	Occurs	Occurs	Frequent	Buddhism + Shamanism
Uzbek Epic	Rare	Very important	Important	Occurs	Islam dominant

Sources: Reichl (2000), Chadwick and Zhirmunsky (1969), comparative epic data.

In Mongolian epics, dzud is also an important motif. However, Buddhist traditions influence Mongolian epic, while Kazakh epic shows synthesis of Islamic traditions and Old Turkic-shamanistic worldview. Among settled peoples of Central Asia (Uzbek, Tajik), natural disasters are depicted differently. Here, water shortage and irrigation problems receive more attention.

## Contemporary Epic Art and Natural Disasters

In the twentieth-twenty-first centuries, Kazakh epic tradition continues. Contemporary bards still perform heroic epics and create new works. Natural disaster themes also remain in contemporary epic. New epics about dzuds from the 1990-2000 period appeared. They use traditional poetic forms but depict contemporary realities.

In contemporary epic art, climate change themes have begun to appear. Bards talk about nature's changes, ecological problems, loss of traditional lifestyle. This shows the possibility of integrating traditional epic forms into contemporary ecological discourse.

Epic tradition's use in education systems is also important. Toibazar et al., 2025, studying the role of Kazakh epics in education, emphasized their importance in preserving cultural heritage. Through teaching epics at schools, younger generations learn traditional ecological knowledge, respect for nature, and skills for overcoming difficulties.

## Eurasian Context: Comparative Analysis

Considering Kazakh epic in the broader Eurasian context reveals interesting parallels and differences. In Russian epic, frequently occurring disasters are floods, forest fires, and severe frosts. These reflect Russian forest regions' ecological conditions. In Germanic epics (Nibelungenlied, Beowulf), natural phenomena are often connected with mythological characters. Storms are gods' wrath, fire is dragon's treasury. Kazakh epic depicts nature phenomena more realistically; they represent concrete ecological conditions.

In Indian epics (Mahabharata, Ramayana), natural disasters are connected with cosmic-scale events. Floods represent world's fall and renewal. In Kazakh epic, natural disasters are more local in nature; they determine specific people's and specific tribe's fate.

In African epics (Sundiata Epic), drought is an important motif (Chadwick & Zhirmunsky, 1969), reflecting Sahel region's climate conditions. Kazakh epic's dzud motif parallels with African drought motif — in both cases natural disasters threaten nomadic or semi-nomadic societies' survival.

### **Contemporary Significance: In the Context of Climate Change**

Study of natural disasters in Kazakh epic acquires new significance in contemporary times. Climate change and ecological crisis create urgency for studying traditional cultures' experiences in relating to nature (Crate & Nuttall, 2016). The 2023-2024 dzud in Mongolia showed the vulnerability of contemporary nomads. 8.1 million livestock died, 220,000 herding families were affected, more than 80,000 children faced educational difficulties.

Kazakh epics contain adaptation strategies to natural disasters. These strategies may be useful in contemporary times: community unity, efficient resource use, observing natural signs, preparation for difficult situations. Epic-encoded ecological knowledge — adapting to environment rather than conquering it — is very needed for contemporary ecological ethics (Oliver-Smith & Hoffman, 2020).

Fernandez-Gimenez et al., 2012, studying post-disaster adaptation and resilience, emphasized the importance of integrating traditional knowledge with contemporary management systems. OCHA, 2024, depicts dzud not only as weather phenomenon but as development issue affecting all economy sectors in Mongolia. Epics give us long-term perspective, wisdom for living with climate unpredictability.

## **RESEARCH METHODOLOGY AND FUTURE DIRECTIONS**

Research of natural disasters in Kazakh epic presents complex methodological issues. First issue is epic texts' reliability. Epics were transmitted through oral tradition and underwent changes during writing. Therefore, comparing multiple versions is important (Pangereyev et al., 2020). When "Kobylandy Batyr" has 29 versions, analyzing all versions is difficult. We focused on major versions but some nuances may be missed. Second issue is interpretation. Epic images are polyvalent; they can be realistic and symbolic simultaneously. For example, dzud is both an actual climate disaster and mythological curse symbol. Researchers must consider both levels. Third issue is historical contextualization. Epics developed over millennia and contain layers of different historical periods. Connecting specific episodes with specific historical events is not always possible. When ancient texts are discussed, we base our analysis on how contemporary historians and anthropologists have understood them.

Future research should pursue several directions. First, detailed analysis of other Kazakh epics (Er Targyn, Alpamys Batyr, Kambar Batyr). Second, broader comparison with Kyrgyz, Uzbek, Turkmen, and Mongolian epics. Third, ethnographic study of contemporary epic art: how do contemporary bards depict natural disasters? Fourth, projects on applying epic knowledge to climate adaptation.

### **Traditional Ecological Knowledge and Cultural Transmission**

Kazakh epic is an important repository of Traditional Ecological Knowledge (TEK). TEK's role in climate adaptation has been studied (Crate & Nuttall, 2016), showing its potential to complement contemporary scientific knowledge. Epics contain natural disaster knowledge in several components: observing natural signs (forecasting weather), recognizing dzud types, adaptation strategy implementation.

Observing natural signs is nomadic wisdom's important part (Berkes et al., 2000; Riseth et al., 2011). In epics, wise characters forecast dzud by natural signs: bird behavior, animal movement, plant growth, sky phenomena. Ecological and socio-economic factors integrated analysis (Tachiiri et al., 2008) showed importance of environmental and socio-economic factors in understanding dzud. Epic knowledge reflects this integrated approach.

Cultural transmission — process of transmitting knowledge across generations — occurs through epics. Children grow up hearing epics, learn about natural disasters, acquire emotional stability skills (Toibazar et al., 2025). Studying epics' educational role, researchers showed their importance in preserving cultural heritage.

### **Research's Theoretical and Practical Significance**

This research's theoretical significance appears in several aspects. First, it proposes new methodological approaches at the intersection of folkloristics and ecological anthropology (Oliver-Smith & Hoffman, 2020). Studying disasters from anthropological perspective shows epics as ecological knowledge sources. Second, it contributes to memory theory. Epics represent mechanisms for processing collective trauma, preserving ecological experience, and transmitting sustainability strategies. Third, it contributes to comparative epics. Comparing Kazakh epic with other Turko-Mongolic and Eurasian epics helps identify general patterns and cultural specifics.

Research's practical significance is also important. First, possibility of integrating traditional ecological knowledge into contemporary climate adaptation strategies. The 2023-2024 dzud in Mongolia (OCHA, 2024; UNDP Mongolia, 2025) showed necessity of combining traditional knowledge with contemporary management

systems. Second, possibility of using cultural heritage in education and tourism sectors. Third, supporting nomadic cultures' sustainability and development.

## RESEARCH LIMITATIONS AND FUTURE PERSPECTIVES

This research has several limitations requiring consideration in future studies. First, epic texts' oral nature means each version has unique characteristics. With 29 "Kobylandy Batyr" versions, complete analysis is difficult. We focused on major versions but some nuances may be missed. Second, historical contextualization presented difficulties. Epics have developed over millennia and contain multiple historical layers. Connecting specific episodes with specific historical events is not always possible. Third, comparative aspect requires expansion. We focused mainly on Turko-Mongolic epics but broader Eurasian or world context comparison would provide further perspectives.

Future research should pursue several directions. First, detailed analysis of other Kazakh epics (Er Targyn, Alpamys Batyr, Kambar Batyr). Second, broader comparison with Kyrgyz, Uzbek, Turkmen, Mongolian epic traditions. Third, ethnographic study of contemporary epic art: how do contemporary bards depict natural disasters? Fourth, projects on applying epic knowledge to climate adaptation.

## CONCLUSION

Natural disasters are important and multifaceted elements of Kazakh epic. They perform multiple functions: narrative tools, mythological symbols, historical memory, ecological knowledge, components of heroic ideal. Dzud, drought, floods, and other natural disasters are depicted in epics at realistic and symbolic levels. They show concrete risks of nomadic life and carry deep mythological significance.

Research identified several functions of natural disasters in Kazakh epic. First, they structure epic time and space. Second, they test heroic characters and determine their fate. Third, they express mythological worldview. Fourth, they strengthen community unity. Fifth, they encode ecological knowledge and transmit it to future generations.

In the context of contemporary climate change, studying adaptation strategies in epics acquires new significance. The 2023-2024 dzud in Mongolia demonstrated traditional knowledge's potential in solving contemporary problems. Epics are not merely past monuments but messages to the future. They speak about humanity's possibility for living in harmony with nature and the qualities needed to overcome disasters and hardship — courage, endurance, wisdom, unity — essential human values.

Dzud's socio-economic consequences were extremely severe. Historical chronicles preserve records of major dzuds in the seventeenth-nineteenth centuries. The 1870-1871 dzud destroyed approximately 1/3 of Kazakh people's livestock (Cameron, 2018). The 1880s dzud was also severe disaster. During Soviet period, dzuds in 1920-1921, 1928, and 1930 (Cameron, 2018; Pianciola, 2017) coincided with famine, resulting in hundreds of thousands of deaths. These records show that dzud is not merely ecological disaster but social and demographic crisis.

Dzud depictions in Kazakh epic reflect this historical experience. Post-dzud famine, population displacement, livestock seeking, and requests for enemy help motifs are frequently encountered in epics. In "Kobylandy Batyr" epic, during dzud the hero seeks help from the Kalmyk khan or goes on campaigns to capture spoils. These motifs reflect nomadic society's actual sustainability strategies.

Research has practical significance as well. First, traditional ecological knowledge integration into contemporary climate adaptation strategies. 2023-2024 dzud in Mongolia (OCHA, 2024; UNDP Mongolia, 2025) showed necessity of combining traditional knowledge with contemporary management systems. Second, cultural heritage utilization in education and tourism sectors. Third, nomadic cultures' sustainability and development support.

This research's limitations must be acknowledged. Epic texts' reliability, especially considering oral transmission, presents first challenge. Multiple "Kobylandy Batyr" versions exist; complete analysis proved difficult. We focused on major versions but certain nuances may have been missed. Second limitation concerns epic interpretation. Epics are rich in multiple meanings and require careful analysis at both realistic and symbolic levels. These represent our efforts to provide comprehensive analysis. Third, historical contextualization challenges due to epics' long development and multiple historical layers. Connecting specific episodes with specific historical events proved impossible in some cases.

Despite these limitations, research conclusions are robust. Kazakh epics contain multifaceted knowledge about natural disasters, human adaptation, and social organization. They represent millennia-accumulated experience of coexisting with nature's challenges. In contemporary ecological crisis period, this knowledge is precious and deserves serious study and application.

## FORWARD-LOOKING RECOMMENDATIONS

Kazakh epic research results should be integrated into contemporary sustainability strategies. First, traditional ecological knowledge should be integrated into climate adaptation planning. Fernandez-Gimenez et al., 2012, studying resilience, emphasized synthesis importance of traditional and contemporary methods. Second, epic tradition should be integrated into educational programs. Through teaching epics, children develop climate stability, community solidarity, and ecological responsibility values. Third, epic heritage should be digitalized and made accessible. Contemporary technologies allow epics to reach broader audiences. Fourth, dialogue between epic knowledge and contemporary climate science should be created. Scientists and bards, ecologists and cultural experts working together could produce meaningful results. Fifth, epic heritage could be utilized in cultural tourism and regional development as resource.

## CONCLUDING REFLECTIONS AND PERSPECTIVES

Researching natural disasters in Kazakh epic has yielded multifaceted and important results. Research shows that in epics, natural disasters are not merely background but are narrative structuring, heroic ideal-forming, social relation-determining, and ecological knowledge-encoding elements. Through epics, people survive as a result of harsh conditions and adapt.

In the contemporary context, specific attention to epic traditions and natural disasters studying is growing. Researchers increasingly recognize evidence suggesting dzud frequency and intensity have increased in recent decades. Dzud from 2000-2002, 2009-2010, 2016-2017, and 2023-2024 (National Statistical Office of Mongolia, 2024) caused great damage to nomadic societies. The 2024 dzud affected 90% of Mongolia's territory (OCHA, 2024) and caused 8.1 million livestock deaths. This represents 12.5% of the nation's total livestock (National Statistical Office of Mongolia, 2024). Approximately 5,000 herding families lost more than 70% of their livestock.

Analyzing dzud economic consequences (UNDP Mongolia, 2025), its multifaceted impacts are evident. Dzud affects not only agriculture but also education, healthcare, transport infrastructure, and social stability. Many herders migrate to cities after dzud (Bekpenbetova et al., 2024), accelerating urbanization and increasing urban poverty.

In climate change context, traditional ecological knowledge becomes extremely important. Studying traditional cultures' climate adaptation strategies (Orlove et al., 2010; Crate & Nuttall, 2016; Berkes et al., 2000), researchers note their additional potential to contemporary ecological management systems. Kazakh epics' adaptation strategies — livestock number regulation, pasture rotation (Humphrey & Sneath, 1999; Fernandez-Gimenez et al., 2012), collective resource pooling, natural sign monitoring — can contribute to contemporary adaptation planning under traditional knowledge integration possibility.

### Interdisciplinary Synthesis and Future Research Orbits

This research is located at the intersection of folkloristics, ecological anthropology, climate history, cultural geography, and traditional ecological knowledge studies. The interdisciplinary approach allowed multidimensional consideration of natural disasters in Kazakh epic. Discussing anthropology and climate change integration (Crate & Nuttall, 2016), the traditional cultures' ecological knowledge study importance is emphasized. Our research develops this direction.

The research contribution to folkloristics is considering epics as ecological memory sources. This approach adds new dimension to epic studies. Traditional epic research mostly focused on aesthetic, historical, or ethnic aspects. Adding the ecological dimension provides deeper understanding of epics' social functions.

Contribution to climate history is using epic materials as information sources on climate events. Information encoded in epic texts — dzud frequency, intensity, and consequences — is valuable for paleoclimatology and historical climatology. Studying climate hazards in western Mongolia (Middleton et al., 2015), historical records' importance is emphasized. Epics are such historical records' rich repository.

Contribution to cultural geography is epic space analysis. In epics, geography is not only physical but also cultural and symbolic. Different landscapes possess different meanings: mountains are trials, rivers are boundaries, steppe is freedom. This cultural geography contributes to understanding nomadic worldview.

Future interdisciplinary research should pursue several directions. First, connecting epic data with paleoclimatology research structure. Second, integrating epic knowledge into contemporary climate modeling. Third, using epic narratives in psychological resilience studies (Lord, 1960; Foley, 1988). Fourth, integrating epic heritage into sustainable development policy.

Epic art's contemporary transformation also deserves attention. In twenty-first century, digital technologies create epic forms' new versions. Epics are recorded in audio and video formats, distributed online, and discussed on social media. This broadens epic heritage accessibility but also changes traditional performance context.

Kappassova et al., 2024, studying intertextuality in Kazakh, Russian, and English media discourse, emphasized intercultural dialogue importance.

Education system's epic use is another important direction. Sultan et al., 2023, studying poetry analysis in Kazakh education context, examined how cultural awareness and academic engagement develop through literature. Teaching epics in schools and universities provides students not only literature education but also ecological awareness, cultural identity, and historical memory. Nurgaliyeva, 2022, studying cultural competence and intellectual curiosity in Kazakh education, showed cultural knowledge's role in academic achievement.

Epic research's gender dimension requires further development. Bekpenbetova et al., 2024, studying philology students' ethnocultural empathy and intertextual literary characters as role models, examined complex gender role dimensions in literature. Epic female characters — Gulbarshin, Qyrq qyz, heroes' mothers — are complex and multifaceted. They perform significant roles during dzud: protect families, give advice, and manage psychological support. Detailed study of these images contributes to understanding gender role divisions' complexity.

Epic heritage tourism also shows promise (Toibazar et al., 2025). In Kazakhstan, cultural tourism development related to epic themes is possible: epic festivals, bard schools, epic museums, epic themed routes. This not only develops tourism industry but also preserves cultural heritage and develops regional areas. Fierman, W. (2005), studying language policy in Kazakh schools, examined education reform importance.

In conclusion, Kazakh epic's natural disasters study's significance should be emphasized again. Epics are not merely literary monuments but living cultural tradition, ecological knowledge system, and sustainability resource. Studying, preserving, and transmitting them is cultural sustainability investment.

In closing, we emphasize that Kazakh epic research is located at important academic junction. Kazakh epic is more than just Turkology or Central Asia studies field. Kazakh epic generates major interest in comparative literature, anthropology, and ecological humanities. International scientific conferences, collaborative research projects, and translations are contributing to introducing Kazakh epic to the world.

In conclusion, Kazakh epic research benefits greatly from interdisciplinary approaches. Folklore scholars, climate historians, anthropologists, and ecologists should collaborate. Kazakhstani universities should organize joint research programs. Contemporary epic art ethnographic study — how do contemporary bards depict natural disasters? — deserves attention. Epic knowledge climate adaptation application projects should be developed.

Finally, Kazakh epics about natural disasters study's significance should be acknowledged. Epics are not merely past monuments but messages to the future. They speak about humanity's capacity to live in harmony with nature and essential qualities for overcoming disasters — courage, endurance, wisdom, unity. In contemporary climate crisis, these values are more important than ever. Studying, preserving, and applying epic wisdom is our duty to past and future generations.

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