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Local Ecological Knowledge from an Anthropological Perspective: An Ethnographic Investigation Based on the Lopliks / Локальное экологическое знание с антропологической точки зрения: этнографическое исследование лопликов

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Аннотация: С тех пор как концепция "местных знаний", предложенная Клиффордом

Гирцем, была введена в экологическую и культурную антропологию, местные экологические знания остаются актуальной темой исследований. Лоплики долгое время жили на окраине пустыни в чрезвычайно засушливом регионе Лоп нур в юго-восточной части бассейна реки Тарим, провинция Синьцзян, Китай. Благодаря своей адаптации к суровой экологической среде, эти люди разработали богатую и эффективную систему местных экологических знаний. Целью данной статьи является изучение традиционных местных экологических знаний лопликов, населяющих регион Лопнур, в основном с акцентом на экономические и культурные основы их жизни, а также основное содержание, типы и культуру, лежащую в основе местных экологических знаний лопликов. В этой статье в основном используются качественные методы исследования, в частности, полевые антропологические исследования, изучение условий жизни испытуемых и получение большого количества данных из первых рук с помощью углубленных интервью, наблюдения за участниками и других средств, что закладывает важную основу для анализа, представленного в статье. Традиционная система экологических знаний лопликов основана на их познании окружающей экосистемы. Все эти местные знания и когнитивные схемы интегрированы наряду с их разнообразными религиозными верованиями, космологией и культурными обычаями, полностью демонстрируя таким образом их высокую жизнеспособность и культурную рациональность в адаптации к конкретным экологическим условиям и защите экосистемы. Изучая местные ценности, системы верований, социальные структуры и ритуальные традиции, антропология дает уникальное представление о взаимодействии культуры и окружающей среды. Это позволяет нам раскрыть экологическую мудрость, значимость и ценности, заложенные в местных культурах и верованиях, а также выявить коренные причины экологических проблем и их потенциальные решения, вытекающие из местного культурного контекста.

Ключевые слова:

лоплики, регион Лоп Нур, антропология, многогранная экономика, адаптации, экологическая среда, экологическое осознание, народные верования, локальное знание, табу

1. Introduction

Local ecological knowledge has become a significant and powerful topic in the study of anthropology. According to Milton[[1], p67-68] , culture serves as a mechanism through which humans interact with their living environment. Building on this perspective, he advocates for viewing environmental determinism as a concern centered on protecting the environment through human responsibility and effort, which he considers integral to humanity's comprehension of the world and their place within nature. Furthermore, he posits that human protection of the environment is a "cultural perspective," - a way of life embedded within a specific culture that guides human behavior.

Since the beginning of the 21st century, numerous research achievements have expanded the field of local ecological knowledge (LEK), contributing to a wealth of research experience and diverse case studies. It is widely acknowledged that the natural resource management methods developed by indigenous peoples, rooted in their local environments, offer models that differ significantly from Western modern management approaches. Behind this management model lies a social mechanism that integrates knowledge, practice, and belief, achieving an effective balance between natural resource utilization, conservation, and

management.

Lily Gadamus and Julie Raymond Yakoubian[[2], p87-101] conducted a survey in the Bering Strait region and discovered that local residents' hunting activities are grounded in a benign interaction between humans and animals. This reciprocal relationship ensures that animals provide food for humans, while humans coexist interactively with animals. According to traditional beliefs, if the relationship between humans and animals is handled properly, animals can be reborn after being hunted; otherwise, they cannot. This belief helps sustain animal populations.

Roncal C M, Bowler M, and Gilmore M P [[3],p2-16] examined the relationship between primates and the Maijuna people, documenting locally circulated stories and elaborating on the importance of indigenous knowledge in primate conservation, as well as the necessity of integrating indigenous culture with economic needs. Similarly, Rasalato E, Maginnity V, and Brunnschweiler J M [[4], p90-97] studied the potential of indigenous ecological knowledge in identifying shark habitats in Fiji Rivers. They recorded myths and legends about sharks, revealing that local perceptions often view sharks as ancestral deities. This belief played a crucial role in the protection of these creatures as the presence of sharks signifies the capture of other fish benefits the livelihoods of local fishermen, promotes ecotourism, and helps sustain the balance of the ecosystem. Consequently, sharks are protected and coexist harmoniously with humans.

Nunes M, Hallwass G, and Silvano R[[5], p197-215] further explored the ecological knowledge of Amazonian fishermen, which facilitates the development of biological hypotheses about fish migration patterns and spawning grounds, contributing to the preservation of aquatic biodiversity. Mukhopadhyay D[[6], p161-170] investigated the ecological consciousness embedded in the resource management practices of the Bishnoi tribe in western India. Devkota S and RP Chaudhary [[7], p2-10] examined the use of lichens by residents in three different regions of Nepal, revealing revealing a rich cultural heritage surrounding lichens. These hold diverse values, including medicinal, ritual, spiritual, edible, aesthetic, and decorative uses.

Akena F A [[8], p221-237] investigated traditional land ownership in the Acholi region, a typical form of sustainable land resource utilization in the semi-arid areas of northern Uganda. By regulating land use among groups with different livelihoods, this model ensures optimzed land resource utilization, maintains a healthy natural ecological cycle, and safeguards public interests. Pyke Michelle L et al. [[9], p2-16] studied traditional wetland management practices among the Kimberley tribes in northern Australia. Indigenous wetland management encompasses not just "cleaning" or maintenance measures but also a holistic set of customs and lifestyles, emphasizing relationships, cultural rituals, individual and community well-being, knowledge system establishment and learning, economic production activities, spiritual knowledge and practices, and more. Assefa, Engdawork, and Hans-Rudolf et al.[[10], p1615-1621] conducted research on the characteristics and development of traditional terraced fields in southern Ethiopia. These fields are crucial for soil and water conservation among local farmers. Farmers generally disapprove of the new terraced field construction promoted by the Ethiopian government and maintain a high level of acceptance for traditional terraced fields, which offer advantages in both environmental protection efficiency and economic feasibility.

Lastly, Aho LT [[11], p355-359] discussed the complex ontological and epistemological issues faced in managing the Otava River in New Zealand. Using an unique indigenous perspective, the author explained indigenous concepts such as "the responsibility and

obligation to manage natural resources" (kaitiakitanga) and "restoring and protecting the integrity of water resources" (Te Mana o te Wai), exploring the challenges and difficulties encountered when integrating locals' holistic and Earth-centered environmental perspective (known as tikanga in the indigenous language) into mainstream Western resource management models and decision-making frameworks.

From the above overview, it is evident that indigenous knowledge underpinning natural resource management in different regions encompasses a complex system of beliefs and ritualistic behavioral norms. This knowledge system emphasizes that humans are neither separated nor in opposition to other species in the natural world. It rejects notions of "conquer" and "be conquered" relationships, or simplistic dynamics of "utilization" and "be utilized". Instead, there exists a symbiotic, coexistent, and mutually beneficial relationship.

Based on ethnography and fieldwork conducted in the Lop Nur region of the southeastern Tarim Basin, this paper offers an anthropological investigation of the traditional local ecological knowledge of the Lopliks, exploring their relationship with the environment and the cultural practices that sustain their way of life.

2. The Multifaceted subsistence and Ecological Consciousness of the Lopliks

In traditional anthropological ethnographic research, some typical groups such as the Inuit, Maori, and Nuer, each representing different livelihood-oriented people, have developed extremely detailed knowledge, understanding, and classification categories of their natural ecological environments during the process of adapting to them. As time goes by, these cognitive patterns and adaptive strategies have become important elements in the knowledge systems, social forms, and even social structures of these societies. This is because such knowledge and understanding often directly stem from long-term observation of and participation in practices related to different elements and characteristics of the surrounding ecological environment.

From an anthropological perspective, the ecological awareness and local ecological knowledge of the Lopliks exhibit a characteristic of being deeply integrated into the fabric of their social life, permeating all aspects of both their material and spiritual lives. Therefore, it is necessary to briefly expound on their livelihood patterns before discussing their traditional ecological knowledge .

For the Lopliks, their livelihood patterns are by no means merely simple survival strategies. Instead, they have formed the cornerstone of their in-depth understanding of the ecological environment they inhabit, as well as the practical process through which local ecological knowledge and wisdom are accumulated.During their long-term life practices, the Lopliks have gradually discerned the basic components and characteristics of the ecosystem they live in by fully recognizing and rationally utilizing various survival resources. This profound understanding has led to the formation of a unique ecological awareness and survival concept among them, that is, they always maintain a balanced and harmonious relationship between the utilization and protection of ecological resources.

Many anthropological studies indicate that in nearly all pre-industrial societies, due to objective factors such as the differing structural characteristics of the distribution of available resources in the ecological environment where people live and the seasonal patterns of resource distribution, people often develop a typical mixed economic-cultural type. As a cultural adaptation strategy, the mixed livelihood model enables these groups to survive, to a large extent, in various complex ecological environments, during food shortages in different seasons, and in the face of natural disasters. Given the complexity of

the environment, the contingency of various natural disasters, and the differences in food distribution structures, it is absolutely impossible to rely solely on a single livelihood method.

In his study of the Basseri people in Iran, the anthropologist Fredrik Barth [[12], p9]wrote that they consume a considerable amount of cereals in their daily diet, mostly purchased or bartered. Some herders also grow a small amount themselves. In line with the summer season during the nomadic cycle when they move less frequently, they sow seeds as soon as they enter the summer pastures and harvest before leaving the summer pastures in early autumn. Sometimes they pay local settled villagers to sow seeds for them and then harvest the crops themselves in autumn." Evans - Pritchard[[13], p27] also reported that "apart from herding, the Nuer people in East Africa also gather various wild fruits, wild vegetables, wild grains and stem-like plants for food. These wild-gathered foods are particularly important, especially in years of famine."

The ecological environment at the desert edge where the Lopliks live is complex and diverse, with uneven and fragile resource distribution. A single livelihood mode is difficult to adapt to such an environment. Therefore, as early as the mid - 19th century, the Lopliks began to engage in a mixed economic model that mainly focuses on fishing and hunting, supplemented by shifting cultivation, and nomadic herding. These are cultural strategies that enable the Lopliks to further utilize various resources on a larger scale by taking advantage of the adaptation opportunities provided by the ecological environment.

By developing multifaceted livelihood types, the Lopliks skillfully utilize resources from different ecological niches, achieving harmonious co-existence with the natural environment. This reflects the adaptive adjustment of human culture to the ecological environment and is a vivid practice of the ecological adaptation theory. The multiple mixed livelihood types avoid over-reliance on and over-exploitation of a certain natural resource. All kinds of livelihood methods complement each other, ensuring the Lopliks's basic living material needs in different seasons and under different environmental conditions, and reducing the risk of survival crises caused by the scarcity of a single resource.

Through these diverse livelihood means, the Lopliks have engaged intensively with different realms of the natural world from multiple perspectives. This has enabled them to amass a wealth of ecological knowledge and practical experience, giving rise to a unique ecological culture and a concept of harmonious co-existence between humanity and nature.

In terms of fishing and hunting, the Lopliks, based on their in-depth understanding of the aquatic ecology, accurately grasp the breeding cycles and migration patterns of fish. They conduct moderate fishing only in appropriate seasons. This not only ensures their own food supply but also avoids over - exploitation of fish resources, maintaining the species balance and stability of the aquatic ecosystem. For example, during the crucial breeding period of fish, the Lopliks will actively reduce fishing activities to create favorable conditions for fish reproduction.

The Lopliks's ecological wisdom is also demonstrated in their livestock-raising activities. They rationally arrange grazing times and the number of livestock according to the growth conditions of local grassland vegetation and seasonal changes. They are well-aware of the carrying capacity of the grassland in different seasons. During the lush summer when there is abundant water and grass, they moderately increase the number of livestock. In winter, when the forage grows slowly, they strictly control the scale of livestock to prevent over-grazing from causing grassland degradation. This fine - tuned regulation of livestock-raising

activities enables the continuous restoration and regeneration of the grassland ecosystem, achieving a harmonious co-existence between animal husbandry and the natural environment.

In their shifting cultivation practices, the Lopliks adopt traditional methods of crop rotation and fallow. They skillfully utilize the different nutrient requirements of various crops for the soil, alternating the cultivation of different crops to avoid a decline in soil fertility caused by continuous monoculture. At the same time, regular fallow periods allow the land sufficient time to recover, effectively protecting the soil ecology and ensuring the sustainability of agricultural production. In addition, when gathering wild plants, the Lopliks also follow certain principles. They only collect ripe fruits and some edible roots and rhizomes to ensure that the reproduction of plants is not affected, maintaining the natural renewal of wild plant communities.

Going deeper into the spiritual life, the Lopliks's concept of nature profoundly reflects their ecological awareness. The Lopliks hold nature in awe, regarding it as an organic whole. The concept that all things have spirits permeates their belief system. In their perception, mountains, rivers, plants, and animals in nature are closely connected to humans, jointly forming an interdependent ecological community. This concept of nature is not only reflected in their daily behavior norms but also integrated into their religious ceremonies, folklores, and traditional customs.

During religious ceremonies, the Lopliks hold activities to worship natural deities, expressing respect and gratitude to the gods of mountains, rivers, plants, and animals, and praying for the protection and blessings of nature. These ceremonies strengthen their emotional bond with nature, prompting people to respect and protect nature in their daily lives. In folklores, the Lopliks often tell stories about harmonious co-existence between humans and nature. Through these stories, they inherit the values of caring for nature and educate future generations to cherish natural resources and live in harmony with nature. In terms of traditional customs, the Lopliks have developed a series of behavioral guidelines for harmonious co-existence with nature in their daily lives, such as prohibiting the random felling of trees and pollution of water sources. These customs serve as intangible norms that restrict people's behavior, ensuring the stability and balance of the ecological environment.

The ecological awareness of the Lopliks is fully manifested in the interweaving of material and spiritual lives. Their mixed livelihood methods have been developed based on a profound understanding and respect for the natural environment, representing a practical expression of ecological awareness in the field of material production. Their concept of nature, on the other hand, provides the spiritual core and value orientation for this ecological awareness, guiding people's behavior from the levels of belief and culture. This close combination of the material and spiritual aspects makes the ecological awareness of the Lopliks a highly adaptable and sustainable cultural model, providing valuable reference and inspiration for modern society in terms of ecological protection and sustainable development.

3. Water Culture of the Lopliks

3.1 Classification of "Male Water" and "Female Water"

Like many arid desert regions worldwide, the Tarim Basin faces some of the most severe water shortages. Water resources are crucial for the survival of all life. For the Lopliks, water is not merely a pure and precious "natural resource" but also a "symbol" implicitly

constructed by their cultural logic. Sahlins[[14], P.380-381] argues that for humans, there is no such thing as a purely natural essence, pure need, or pure material force that has not been culturally constructed. This does not negate ecological or biological constraints but rather underscores that culture shapes all human understanding of nature.

As a manifestation of a symbolic system, water holds significant symbolic meaning in the cultural beliefs of the Lopliks. In their conception, water is generally classified into two categories: "male water" and "female water." The classification of "male water" and "female water" is partly determined by direct perception of water, such as streams, rivers, and lakes exposed on the earth, which are relatively warm and teem with various fish and other organisms the Lopliks rely on for survival. Conversely, water found underground or in caves is cold and devoid of visible signs of life. This classification is closely tied to their traditional sun worship and correlates with gender concepts in their social life.

The Lopliks believe the sun is omnipotent; its light not only illuminates the heavens and earth, nurtures all life, but also has the power to transform the nature of things in the natural world. They deeply believe that water exposed to sunlight possesses a special function, benefiting the human body and nurturing fish and other organisms they depend on. Hence, they name this sunlight-exposed water "male water" partly because it contains a "sacred element" bestowed by the sun's rays, promoting health and vitality. Additionally, in their culture, men are responsible for external affairs, such as providing for the family and ensuring life continuity. Conversely, they consider water not exposed to sunlight as "female water." Since this water lacks the sun's rays, it is deemed devoid of the "blessing of the sun god" and classified as internal and cold, making it harmful to the human body and even capable of causing illness.

The Lopliks' understanding and classification of this dual water structure originates from their sun worship, culturally classifying water based on its environment and relationship with the sun, thereby shaping their understanding of the world, including classifications such as "cold and heat," as well as social, gender, internal and external, good and bad, high and low status, each imbued with cultural symbolism. "Male water" is considered external, powerful, with practical value and function, and beneficial to people while "female water" is seen as internal and potentially harmful. Corresponding norms and taboos are constructed to regulate daily life behaviors, thereby establishing the Lopliks' life order and guiding and constraining their social behaviors. In other words, the Lopliks extend their sun worship beliefs through the natural and social classification of water to other aspects of social life, even to gender divisions, reflecting the depth and breadth of traditional sun worship's influence on their social life. It also demonstrates how locally self-constructed ideology or cultural order constrains social reality, showcasing the intricate relationship between cultural beliefs and environmental adaptation.

3.2 The Lopliks' Concepts and Taboos Regarding Water

Surrounding sacred "male water" sources like rivers and lakes, the Lopliks follow a series of customary and unwritten behavioral norms and taboos established over long periods of oasis life. For instance: "Do not spit, blow your nose, or defecate into the water, or your face will develop abscesses." "Do not dump trash, animal blood, or filthy objects into the water." "Do not build toilets or animal pens near the water." "Do not perform filthy acts near the water." "Do not comb your hair or wash clothes near the canal." "When fetching water, it is taboo to straddle the canal and scoop water from both ends." "When drawing water, use a public bucket and then pour it into your own bucket. Do not draw water directly from the source with your own bucket." "Use water moderately and appropriately in daily

life, and do not waste it," and so on. These widely existing behavioral norms and taboos related to water apply to all of water sources and reflect a deep integration of traditional beliefs. Overtime, these taboos have gradually become an important part of the Lopliks' local ecological knowledge system, playing a positive and significant role in protecting local water resources and the ecological environment.

In Ortan village, within a radius of several hundred kilometers where villagers can graze, there are 18 mountain springs that flow year-round. In a mountain gully over 70 kilometers from the village, there is a "well" locally known as the "Ancient Well," a small pool formed by converging water bubbling up from a spring. According to villagers, these 18 mountain springs within the surrounding hundreds of kilometers are a gift from heaven, crucial for their survival, as well as that of their livestock and animals, in this arid region. For the locals, trickling spring eyes and flowing spring water considered sacred. They believe that bathing, washing clothes, or throwing dirt into the mountain springs s constitutes a desecration of the sacred water and an offense to the gods, which will provoke the gods' anger, resulting in decreased water flow or complete drying up. To appease the gods, villagers bring offerings and gather at the spring source to perform traditional rituals of atonement along with several religious ceremonies. If the gods calm their wrath and forgive the people, the spring water will increase or return to its original state.

3.4The "Yada" Rain-Seeking Ceremony of the Lopliks

The Lopliks have preserved many ancient traditional folk beliefs and customs, including the rain-seeking sorcery commonly known as "Yada." According to RuJI Niu [[15]p. 669], the Lopliks used to perform the "Yada" sorcery to seek rain, documented in both the "Products Section" of "Records of the Western Regions" by Chun Yuan in 1777 and "The History of Hamid" published in 1908. "Yada Rain-Seeking Sorcery" was originally a widespread ritual in the customs of various ethnic groups or tribes speaking Altaic languages. "Yada" (or "Yadatash"), also known as "Yada" or "Zhada," refers to a type of stone, often a gallstone from cows, sheep, or other animals, used by sorcerers to summon wind and rain. By soaking this stone in water and chanting incantations, the sorcerer was believed to bring about rain and wind, commonly practiced during prolonged droughts. However, this form of sorcery has long disappeared in many Altaic-speaking ethnic groups or tribes. Nonetheless, in contemporary Lopliks communities, there are still individuals who can recite the incantation songs associated with "Yada Rain-Seeking Sorcery."

During the "Yada Rain-Seeking Sorcery" ceremony, the Lopliks recite incantations for rain, then slaughter a horse, drip its blood onto the Yada stone, and bind the horse's head and a water snake together before placing them in flowing water as an offering to the gods. Additionally, they separate the young offspring of domestic animals, such as lambs, calves, young camels, and colts, from their mothers, causing them to bleat and cry. Concurrently, children are made to cry, creating a heart-wrenching atmosphere of young animals and infants suffering from drought and desperately awaiting nourishment, pleading for mercy from the heavens. Alongside the Yadechibag (the sorcerer managing the Yada sorcery ceremony), they pray to the heavens, beseeching, "Please bless us, great gods, and forgive our sins. Grant grass and milk to these voiceless animals, and provide us with food without restriction," along with other such prayers, imploring the heavens for rain.

In the beliefs of the Lopliks, the rain-seeking sorcery ceremony serves a specific purpose. Behind this rain-seeking sorcery lies a simple yet profound logic: water, as a vital resource and a symbol of wealth, can only be obtained through the permission and blessing of the gods. At this juncture, water transcends its status as a natural substance, becoming a

medium that connects humans and gods. This is a form of wealth bestowed upon humanity through divine blessings. If people fail to cherish and protect it, the gods will undoubtedly reduce or even cease sending rain. Although from a modern scientific perspective, there is no empirical basis establishing a causal link between the rain-seeking ceremony and rainfall but from the cultural logic underlying local knowledge, this relationship not only exists but also continues to produce the expected ritual effects. Within the context of this ritualized behavior and cognitive system, the Lopliks have gradually formed the custom of valuing and protecting water, refraining from wasting or polluting it in any way, thereby maintaining a harmonious relationship with the natural world. As a collective ritual practice, the core function of the rain-seeking sorcery ceremony lies in providing spiritual support and hope to the participants, prompting them to cherish and protect water resources within the sacred ritual context. Through the practical logic of cultural subjects, this custom is continuously produced, reproduced, and steadfastly passed down across generations.

4. The Ecological Consciousness Reflected in the Taboos Related to Animals and Plants Among the Lopliks

Taboos are among the folk customs with normative functions. While they lack formal enforcement mechanisms, the potential for disastrous consequences and the psychological restraint imposed by curses upon violating a taboo enable them to regulate community behavior.

4.1 Taboos Related to Plants Among the Lopliks

In the arid oasis region of Lop, green plants are the tangible manifestation of water resources. Additionally, plants play a crucial role in storing and protecting water, particularly forests in the desert, which act as reservoirs of water resources and natural barriers against wind and sand. The Lopliks are deeply aware of these ecological phenomena closely tied to their survival. Many of their proverbs and sayings are intimately connected to plants, such as "Forests are reservoirs; they store water during abundance and release it during scarcity," "More forests mean fewer disasters from wind and drought," "Those with gardens have a reliable support," and "Farmers and wealthy individuals without forests and orchards are not truly farmers and wealthy." Similarly, they use proverbs or sayings to express taboos related to plants, aiming to protect these vital plants. For instance, "Do not cut down fruit trees until they are dead," "Nightingales will not sing in a garden without flowers," "Plant ten trees for every one cut down," and "Those who break young seedlings will suffer an early death." Although these taboos are conveyed through proverbs and sayings, they are internalized during the socialization or enculturation process, forming an invisible and inherent restraint. By constructing various taboos and beliefs to regulate behavior, the Lopliks not only regulate actions but also foster an "ecological consciousness" that deeply embeds environmental protection within their spiritual worldview.

4.2 Worship of Plants

In the Lop Nur region, there is a widespread custom of worshiping trees, where people pray to trees for recovery from illnesses, longevity, and health. Among the Lopliks, for example, there is a popular practice of using tree branches to heal diseases by rubbing them on the back. This ritual is believed to drive away evil spirits, cure illnesses, strengthen the body, and rejuvenate vitality. Additionally, there are practices like chanting scriptures with tree branches to cure diseases. Sacred trees are attributed with divine qualities, the most significant being their ability to avert disasters and bring blessings and well-being. This consciousness is intimately connected to the life philosophy implicit in the Lopliks' tree

worship customs. In various oases, there are sacred trees revered by the local populace, believed to ward off illnesses and bring blessings. This phenomenon also exists among other Uyghur groups in arid regions, exemplified by the “Hay-Hay Tree” in Kashgar, Xinjiang, China, and the "Walnut King" in Hotan County, an 800-year-old walnut tree. As many people seek blessings and good fortune from the Walnut King, touching the tree to receive blessings, parts of the tree accessible to people have become smooth and shiny. This reflects the traces of local people's worship of greenery in this ancient tree, which has witnessed the vicissitudes of the oasis.

In the Tarim Basin in southern Xinjiang, there are numerous populus euphratica trees. As a tree uniquely adapted to arid environments, its deep roots absorb water from over ten meters underground, allowing it to thrive for hundreds, sometimes thousands, of years. The strong adaptability and vitality of Populus euphratica have deeply influenced the Lop people living around the Tarim Basin. They refer to populus euphratica as "hero trees" and praise it with the saying, "It lives for thousands of years without dying, stands for thousands of years after dying, and does not decay for thousands of years after falling." Thus, the spirit of resilience embodied in Populus euphratica has become a symbol and aspiration for the Lopliks' adaptation to nature. Consequently, populus euphratica has also become a symbol of health and longevity in the hearts of the Lopliks.

Furthermore, the Lopliks' worship of Populus euphratica is evident in their custom of using it to make coffins for burials. When burying the dead, the Lopliks use coffins made from dead Populus euphratica wood, a practice also driven by the religious beliefs of the majority of the Lopliks who worship Populus euphratica. They believe that Populus euphratica possesses the aforementioned "divine" attributes of enduring life, standing tall after death, and not decaying. Therefore, they believe that being buried in a Populus euphratica coffin will endow the deceased with the "divinity" of the tree, preserving their body intact and protecting their soul from sufferings, ensuring eternal life.

5.Taboos and Custom Related to Animals

The Lopliks have also developed protective measures for the animals they depend on, often expressed through colloquial sayings, proverbs, or even written taboos. For instance, it is locally believed that "whoever catches a young bird with immature feathers will have their hands tremble"; "those who steal or break bird eggs or destroy nests will have freckles on their faces"; "danger and disaster brought to animals will also fall upon humans," and so on. These beliefs are often internalized during the process of enculturation or socialization. An 86-year-old villager said that the Lopliks have a rule everyone must follow: never hunt pregnant animals. This principle is deeply ingrained in their minds, leading to the establishment of hunting seasons. If a hunter accidentally violates this rule, like killing a pregnant deer and its unborn offspring, they will feel a sense of guilt akin to killing their own mother and child.

It is not crucial whether these folk beliefs, rituals, and taboos of the Lopliks have a definite causal relationship with subsequent events in real life, their impact lies in the moral education they provide. Through stories of violators being punished by heaven or gods, people are educated and form a consensus to respect beliefs and adhere to taboos, internalizing them and developing into self-restraint. Additionally, it can be observed that in daily life, the deterrent power of certain religious beliefs is sufficient to prevent malicious behaviour, potentially achieving practical results in ecological preservation. Therefore, every ethnic group's belief system contains elements contributing to protecting the ecological environment. In light of this, John Colding and Carl Folke[[16], P584-600] refer to various

existing and functional folk knowledge systems, such as taboos and beliefs, as "invisible systems for managing local resources and protecting ecological diversity." These systems possess characteristics of locality, collectivity, longevity, and integration.

6.The Modern Destiny and Dilemmas of Traditional Local Ecological Knowledge

In the arid inland desert oases, the Lopliks, whose livelihoods primarily depend on fishing and hunting, require abundant water resources to sustain their economic activities. Water is also the most critical ecological factor for the survival of all organisms within the arid-region oasis ecosystem. As a result, the Lopliks' society and culture are highly susceptible to ecological changes, particularly water shortages or reductions.

In 1980, Lop Nur Lake dried up. Although this was due to multiple complex factors, it was related to deforestation, land reclamation for irrigated agriculture in the upper and middle reaches of the Tarim River over the past century, and the repeated cutoff of water sources flowing into Lop Nur Lake. Historically, according to Yanhu Cui[[17],P29-36], the ecological environment of Tarim Basin has evolved through several large-scale development periods in modern Xinjiang. From the late Qing Dynasty to the early 1970s, there were three major development phases. These periods were characterized by: first, an emphasis on agricultural development, mainly through large-scale land reclamation and agricultural intensification; second, the resolution of labor demands through immigration and garrison reclamation, with immigrants predominantly being the agricultural population, especially in the third phase; third, a resource-based development model targeting natural resources such as land, water, and minerals, which directly impacted the ecological environment. These development periods led to unprecedented human intervention in the arid and semi - arid ecosystem.

With the further degradation of the ecological environment, the southern lake area in the Lop Nur Region lost its water source and reverted to a desert. Chunxian Han , Guanghui Lv[[18],P60-66] have found that the Lopliks, who had long lived in relative isolation in the Lop Nur Region, were forced to migrate. Some moved south from Abudan Village to Miran, adopting a farming and herding lifestyle, while others relocated to Karquga Village in Yuli County, engaging in settled farming and gradually integrating with the local Uyghur community. Only a small number remained in the Lop Nur reed beds, sustained by limited river overflow or autumn- winter slack-season water, maintaining a primitive fishing and hunting lifestyle until the mid-20th century.

According to relevant documents, after leaving their homeland of Lop Nur Lake, most Lopliks moved to Karquga Township in Yuli County. Deprived of the ecological basis for their original social culture, they had to integrate into the Uyghur community, which had long practiced agriculture and animal husbandry. The settlement process, economic transformation, cultural reconstruction, and localization, along with frequent cultural exchanges, accelerated the cultural changes among the Lopliks.

After moving out of their original ecological environment and into a settled society, the Lopliks' social and cultural environment underwent fundamental changes, disrupting the evolution of their traditional culture. The new agricultural and pastoral lifestyle prompted them to learn from the mainstream Uyghur society. Through long-term ethnic interaction, the Lopliks' original culture was acculturated. They gradually abandoned or modified their original ethnic social and cultural characteristics, and the traditional ecological knowledge formed and accumulated through their fishing and hunting lifestyle was gradually forgotten.

Since the 1980s, with changes in the economic lifestyle and social environment, the Lopliks

in Karquga Township have experienced significant shifts in their economic awareness, resource concepts, attitudes towards the natural ecological environment, and behavior patterns. While acknowledging their economic development in recent decades, we must also address issues such as grassland degradation, Populus euphratica forest destruction, and the decline of animal husbandry due to agricultural expansion. From an ecological anthropology perspective, there is a dynamic balance and adaptive relationship between culture and the environment, including technology, labor, and resources. Production modes are largely determined by available technology and exploited resources, and in turn, influence social systems, including living patterns, social structure, community scale and location, cultural concepts, and customs.

It is understandable that when survival-based resource extraction evolves into profit-driven demand, the original "ecological rationality" and "ecological consciousness" are increasingly replaced by the "economic rationality" that pursues maximum economic benefits. This has led to remarkable ecological changes. In Karquga Township, the "economic-development-oriented" agricultural and pastoral economic model has transformed the Lopliks' traditional ecological rationality into an "economic-rationality-centered" behavior and concept system. Their concept of "utilizable" resources has also expanded.

Shortly after the establishment of Karquga Township in the 1980s, to improve the local economy, the government implemented measures to enhance the economic awareness of the local people. With the arrival of outside merchants, the desert grasslands, previously regarded as grazing areas, took on new economic significance. Licorice, apocynum venetum, etc., important for grassland protection and self-regulation, became sources of income for the Lopliks in Karquga Township. Digging licorice, collecting apocynum venetum, and ephedra sinica became popular ways to get rich. However, licorice - digging has severely damaged the local grassland ecology. Despite the author's attempts to obtain data on the damaged grassland area, it remains unclear, but the visible degradation and desertification are evident. The following two field-survey cases reflect the economic-rationality-driven changes in the modern Lopliks' ecological concepts: *Case 1: Villager Nasr Kurban stated, "Nowadays, people are digging licorice, apocynum venetum, and ephedra sinica everywhere. The grassland is full of bald patches, turning into sandy land. The grass has become shorter and sparser. In the past, we could drive sheep 20 kilometers a day, but now, even if we walk 30 kilometers, the sheep can't get enough to eat. The grass by the riverbank also grows poorly due to less water." Case 2: "For us in Karquga, licorice is like an ATM. When we need money, we can just go dig some licorice. It's easy to make money as one kilogram of licorice can be sold for three yuan. On the grassland, one can dig dozens of kilograms in a few hours."* In summary, after the drying up of Lop Nur Lake and the large-scale migration of the Lopliks, there have been changes in economic production modes and social-cultural transformations. Subsequently, economic rationality and a new value system have gradually replaced or reconstructed the cultural logic and inheritance mechanism of the Lopliks' traditional ecological knowledge. Meanwhile, the secularization of daily life has undermined the religious-belief-based sacred foundation of their traditional ecological knowledge. A significant number of modern Lopliks no longer revere nature or view natural resources with traditional values.

This may be a typical modernity crisis commonly faced or experienced by many pre-modern societies during their transition to modern or post-modern societies. As modernity "disembeds" from the experiential structure of traditional society and enters modern society, humanity has established its subjectivity over nature, the "other," thus replacing the concept of "the earth as mother" with the idea of the separation of man and nature

through the dichotomy of subject and object. The assertion of this subjectivity has led people to believe that humans have sufficient capabilities and means to control nature, and that other existing substances only possess instrumental value. This concept ignores the inherent value of nature itself, thereby challenging the idea of respecting nature and living in harmony with it, which is embedded in traditional local ecological knowledge. At the same time, influenced by the long-standing binary thinking patterns in the fields of humanities and social sciences, such as savage/civilized, advanced/backward, traditional/modern, and center/periphery, currently, the local knowledge of many ethnic groups is largely regarded as "traditional." Since it is "traditional," it is completely opposed to what is "modern." For standardized, institutionalized, and central modern science or the mainstream scientific concepts of the era, the so-called local knowledge is an informal cognitive system or a marginal knowledge system.

In such a context, local knowledge does not receive the due attention and play its proper role in the social and cultural fields, especially among the elites in the upper echelons of society and the intellectual community. In the process of modernization, many traditional local ecological knowledge systems face the risk of inheritance disruption. With the younger generation migrating to cities and the popularization of modern lifestyles, much of the traditional ecological knowledge is gradually being lost. This prevents these precious ecological wisdoms and practical experiences from being effectively utilized and passed down.

5.Conclusion: Reflections on Local Knowledge

Cross-cultural anthropological research has universally acknowledged the intricate, interdependent, and mutually constraining relationship between human activities and the environment. This offers a novel perspective for comprehending ecological issues pertinent to human survival and environmental quality, enabling societies to adjust our relationship with the environment through cultural mechanisms.

This paper employs anthropological theories and methods, combined with fieldwork data, to delve into the local ecological knowledge of the lopliks. The study unfolds across dimensions such as the interaction between the lopliks and their natural environment, economic production modes, cultural traditions, and religious beliefs, aiming to unveil the internal logic of how traditional societies adapt to their surrounding environments and subsequently develop unique systems of ecological knowledge. The traditional ecological knowledge of the lopliks represents a synthesis of ecological consciousness, cognitive systems, worldviews, values, attitudes towards life, and behavioral patterns formed over long-term adaptation to the harsh ecological environments of inland arid regions, embodying profound cultural logic. In nature, this type of knowledge is characterized by a marked integration of empiricism and practicality. The arid regions are plagued by harsh environments, scarce water resources, variable climates, slow-growing and scattered vegetation. Against this backdrop, local communities have accumulated extensive firsthand experience about natural phenomena through continuous observation and practice over generations. This knowledge, rooted in direct contact with nature, has gradually precipitated through trial and error. More importantly, as an ecological consciousness and cognitive system, the traditional ecological knowledge of the lopliks is deeply embedded in the local cultural system, closely intertwined with religious beliefs, worldviews, and folk traditions, forming a strong cultural logic. The traditional ecological knowledge of the lopliks encompasses their understandings of water, plants, animals, and other natural elements, operating on a logic based on profound insights into and alignment with natural laws. Taboos related to natural resources strictly regulate people's behaviors. This collective

cognition, values, and ritualized collective actions reinforce the community's respect for nature and awareness of resource conservation. Ritual practices and taboos not only serve as spiritual anchors but also as crucial vehicles for cultural transmission, passing down reverence for nature from generation to generation. From a functional perspective, the operation of traditional ecological knowledge enables the local community to persist in harsh environments, achieving harmonious coexistence between humans and nature. This knowledge system is not only a crystallization of the lopliks's long-term wisdom in adapting to their environment but also holds significant reference value for modern ecological conservation and sustainable development. Amidst the current severe challenges to the global ecological environment, in-depth research into the traditional ecological knowledge of arid region communities can help broaden perspectives, explore sustainable development paths that align with natural laws, and promote long-term harmonious coexistence between humans and nature.

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Результаты процедуры рецензирования статьи

В связи с политикой двойного слепого рецензирования личность рецензента не раскрывается.
Со списком рецензентов издательства можно ознакомиться здесь.

Review of the Article "Local Ecological Knowledge from an Anthropological Perspective: Ethnographic Study of the Lopliks"
The article presents an insightful and significant study of the local ecological knowledge of the Lopliks, a group residing in the Lop Nur region of the southeastern Taklamakan Desert. The author delves into various facets of Loplik life, including their interactions with the natural environment, societal structures, cultural traditions, and religious beliefs. This work contributes substantially to understanding how traditional societies adapt to their surroundings and develop unique systems of knowledge about nature.
The research deals with the local ecological knowledge of the Lopliks, encompassing their perceptions of water, plants, animals, and other natural elements. The author explores these observations through an anthropological lens, focusing on the cultural dimensions of human-nature interactions. Particularly notable is the analysis of rituals and customs concerning water and other natural resources, alongside their roles in sustaining a resilient lifestyle.
The study employs an ethnographic approach, relying on fieldwork and interviews with members of the Loplik community. This methodology allows the author to gain a deep understanding of the culture and everyday life of the studied group, highlighting their perceptions of the world and their connections to it. Historical sources and literary data are also incorporated, enriching the contextual background and evolution of local traditions.
The research is timely, given current discussions on cultural heritage preservation and traditional knowledge of indigenous peoples. Issues of ecology and sustainable development are increasingly relevant globally, and studying examples like the Lopliks may help identify innovative approaches to addressing environmental challenges. Moreover, the article highlights the importance of incorporating local knowledge and practices in designing programs aimed at conserving nature and managing natural resources.
The novelty of this study lies in its comprehensive examination of Loplik ecological knowledge, linking it to cultural and social aspects of their existence. The work introduces original material that could serve as a foundation for further investigations in anthropology, environmental science, and cross-cultural studies. The author's integrative approach, combining various data sources, strengthens the robustness and depth of the conclusions drawn.
The text is well-structured and logically presented. The introduction clearly defines the objectives of the study, while each subsequent chapter systematically unfolds the themes.

However, at times, the writing style might appear dense due to the frequent use of specialized terminology, which could make it challenging for non-specialist readers. Nevertheless, the academic rigor of the piece aligns with high standards of scholarly literature.

The bibliography is extensive and varied, spanning classical works in anthropology and ecology as well as recent studies. This indicates the author's thorough familiarity with existing scholarship and commitment to situating the findings within the broader academic discourse.

The author exhibits openness to dialogue and acknowledges possible limitations of the study. For instance, there is recognition of the need for additional research on topics such as the historical changes in Loplik culture or comparative analyses with neighboring ethnic groups. Such an approach fosters scholarly debate and encourages further inquiry.

The findings emphasize the importance of Loplik ecological knowledge and its applicability to contemporary environmental concerns. The author notes that the research results can serve as invaluable tools in safeguarding biodiversity and maintaining the resilience of ecosystems. Despite some fragmentation in the conclusions, they represent a meaningful step forward in understanding the interrelation between culture and nature.

The appeal of the article would primarily lie with academics and researchers in anthropology, ecology, and cultural geography. Students and scholars interested in traditional knowledge and sustainable development may also find it compelling.

Here are the suggested remarks for reworking the article:

The conclusions seem somewhat fragmented and incomplete in places. It would be beneficial to consolidate the main ideas and present a more unified conclusion that encapsulates the central theme of the research.

Incorporating more information about the historical dynamics of change in Loplik culture and their interactions with neighboring groups would add depth to the study. This would help better understand the evolution of their traditions and their responses to external influences.

Providing more examples from fieldwork or ethnographic observations could illustrate key points more vividly. Concrete examples would demonstrate local practices and their connection to environmental sustainability more effectively.

I recommend publication in the journal "Chelovek I Kultura" pending incorporation of the suggested revisions into the text of the work.

Результаты процедуры повторного рецензирования статьи

В связи с политикой двойного слепого рецензирования личность рецензента не раскрывается.

Со списком рецензентов издательства можно ознакомиться здесь.

Известно, что нарушение экологического равновесия во все времена приводило к катастрофам, в ходе которых разрушались цивилизации. Всем памятна судьба Харрапской культуры, достигшей небывалых для того времени высот и тем неожиданнее исчезнувшей с лица нашей планеты. Сегодня в условиях глобального мироустройства очевидна необходимость выстраивания дружеских отношений между человеком и природой.

Указанные обстоятельства определяют актуальность представленной на рецензирование статьи, предметом которой являются взаимоотношения лопликов с окружающей средой. Автор ставит своими задачами рассмотреть дефиницию локального экологического знания, проанализировать экологическое сознание лопликов, раскрыть водную культуру лопликов, показать табу и обычаи, связанные с животными.

Работа основана на принципах анализа и синтеза, достоверности, объективности, методологической базой исследования выступает системный подход, в основе которого находится рассмотрение объекта как целостного комплекса взаимосвязанных элементов. Автор использует также сравнительный метод.

Научная новизна статьи заключается в самой постановке темы: автор стремится на примере лопликов охарактеризовать экологическое знание с антропологической точки зрения.

Рассматривая библиографический список статьи, как позитивный момент следует отметить его масштабность и разносторонность: всего список литературы включает в себя 18 различных источников и исследований. Несомненным достоинством рецензируемой статьи является привлечение зарубежной литературы, в том числе на английском и китайском языках, что определяется самой постановкой темы. Из привлекаемых автором трудов укажем на исследования К. Милтона, Л. Гадамуса и Л. Якубяна, в центре внимания которых находятся различные аспекты изучения местных экологических знаний, а также китайских специалистов, посвященных жизни лопликов в восточной части бассейна Тарима. Заметим, что библиография обладает важностью как с научной, так и с просветительской точки зрения: после прочтения текста читатели могут обратиться к другим материалам по ее теме. В целом, на наш взгляд, комплексное использование различных источников и исследований способствовало решению стоящих перед автором задач.

Стиль написания статьи можно отнести к научному, вместе с тем доступному для понимания не только специалистам, но и широкой читательской аудитории, всем, кто интересуется как экологическим знанием, в целом, так традиционными местными экологическими знаниями, в частности. Аппеляция к оппонентам представлена на уровне собранной информации, полученной автором в ходе работы над темой статьи.

Структура работы отличается определенной логичностью и последовательностью, в ней можно выделить введение, основную часть, заключение. В начале автор определяет актуальность темы, показывает, что «коренные знания, лежащие в основе управления природными ресурсами в разных регионах, охватывают сложную систему верований и ритуальных поведенческих норм». В работе показано, что «традиционные экологические знания лопликов охватывают их понимание воды, растений, животных и других природных элементов, действуя на основе логики, основанной на глубоком понимании и соответствии естественным законам». Автор обращает внимание на то, что «ритуальные практики и табу не только служат духовными якорями, но и важнейшими средствами культурной передачи, передавая почтение к природе из поколения в поколение». В то же время как справедливо отмечает автор, в связи «с миграцией молодого поколения в города и популяризацией современного образа жизни значительная часть традиционных экологических знаний постепенно теряется».

Главным выводом статьи является то, что «с функциональной точки зрения использование традиционных экологических знаний позволяет местному сообществу выживать в суровых условиях, достигая гармоничного сосуществования между людьми и природой».

Представленная на рецензирование статья посвящена актуальной теме, написана на английском языке, вызовет читательский интерес, а ее материалы могут быть использованы как в учебных курсах, так и в рамках понимания экологических проблем, связанных с выживанием человека и качеством окружающей среды.

В целом, на наш взгляд, статья может быть рекомендована для публикации в журнале «Человек и культура».