Philosophy Study, December 2017, Vol. 7, No. 12, 662-671
doi: 10.17265/2159-5313/2017.12.004

Traditional Ecological Knowledge and Practices of Ethnic Kyrgyz of the Eastern Pamir in Ethnotoponyms

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The author analyzes ethnotoponyms, the local place names of Kyrgyz people living in the Murgab region of Tajikistan's Gorno-Badakhshan Autonomous region. The author conducted field research in the region in 2010-2015. The article also builds on data from the works of pre-Soviet Russian and western travelers, who studied the region at middle19th early 20th centuries. The author concludes that local place names given by Kyrgyz people to the mountains, rivers, lakes, and valleys reflect the unique features of natural landscapes of Eastern Pamir as well as Kyrgyz nomads' empirical observations of natural phenomena and processes, livelihoods and nomadic values.

Keywords: ethnotoponyms, local place names, traditional ecological knowledge, natural and cultural heritage, Kyrgyz people in Murgab, Eastern Pamir

1. Introduction

Unique landscapes of Murghab plateau are located at the altitude of 3,500-5,000 meters above the seas level. Murghab occupies the eastern part of Pamir Mountains in modern Tajikistan's Gorno-Badakhshan Autonomous Region (GBAR). The region features contrasting landscapes such as dead-alive alpine deserts, lush meadows and glaciers, salt marshes and hot springs, cold rivers, and saline lakes, etc. For many centuries, this region was inhabited by many Pamir ethnicities as well as (Murghab) Kyrgyz people. As of 2014, 12,000 ethnic Kyrgyz people live in Murghab district of GBAR (1, 270). Natural and climatic conditions of areas inhabited by local Kyrgyz nomads favor sheep- and yak-breeding. Livestock breeding remains to be a key element of their (Kyrgyz people's) livelihoods. Kyrgyz people in Murghab follow their ancestral traditions and exercise a semi-nomadic lifestyle.

For my research, I studied information about Eastern Pamir, which can be found in the travels logs of traders and pilgrims who travelled along the Silk Road from China to the Mediterranean. Russian and Western travelers and researchers who visited Pamir at middle19th early 20th centuries (i.e., the period of time usually referred to as the Great Game, that is the geopolitical struggle between the Russian and British empires over resources in Central Asia) described extremely harsh climate with drastic differences between day and night temperature, howling winds as well as rich resources and the everyday life of the nomadic Kyrgyz people. I also analyzed historical and ethnographic materials produced during the Soviet times. These materials portray Kyrgyz people's traditional culture as something from historical past, something unrelated to modern time and to the future. As a result, all rituals, rites, beliefs, and practices were posed as historical rudiments that lost their

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meaning and significance. Growing self-awareness, search formational identity, need to meet the modern challenges after gaining independence, sparked scholarly interest of historians, anthropologists, philosophers, philologists, ecologists, botanists, zoologists, etc. towards Kyrgyz people's traditional heritage, traditional ecological knowledge, pastoral practices, which have been tested through time.

Archived travel logs, historical materials were compared against fieldwork data on Murghabi Kyrgyz people's traditional knowledge. The fieldwork was conducted among ethnic Kyrgyz people of Murghab district of the GBAR (Tajikistan) in 2010-2015. I conducted focus-group discussions and surveys of traditional ecological knowledge (TEK) and recorded oral histories, legends and stories. I also produced ethnography via conducting in-depth interviews and direct and participatory observation. Analysis of all these data shaped the ideas and conclusions presented in this paper.

2. Preserving Inseparable Ties with the Nature

Kyrgyz nomads have lived in harmony with nature for many centuries. Their traditional worldview was holistic, that is the entire world which was perceived as a single organism in which all species (including humans) coexist and procreate. Traditional images such as Jer-Ene (Mother Earth), Ot-Ene (Mother Fire), and Bugu-Ene (Mother Deer) reflect sacred ties of Kyrgyz nomads to Nature and Earth. The notion that all living beings have the same father—the Sun, the same mother—the Earth, the same blood— the Water, and the same soul—the Air was the basis of this holistic worldview. Kyrgyz nomads called their lands "Mal kindiktüü jer," which literally means "the land and livestock connected by an umbilical cord." This metaphor helps to better understand the local context.

Kyrgyz nomad's traditional ecological knowledge has been accumulated based on nomadic lifestyle and is shaped by local climatic and mountainous landscapes. Kyrgyz nomads observed, applied the knowledge into practice, monitored the results and transmitted accumulated knowledge from generation to generation. Natural conditions were a key element that formed spirituality of the Kyrgyz nomads. The multi century old livelihoods adaptations were accompanied by spiritual adaptations as well. Reverence towards nature in Murghabi Kyrgyz people's spirituality ensured survival, sustainability, and equilibrium in human-nature interactions as well as continued transmission of traditions over millennia.

Kyrgyz nomads' traditional knowledge includes:

- Knowledge about Nature and Earth (traditional ways of observing natural phenomena, wildlife behavior, observing stars and weather forecasting, a lunar-solar calendar);
- Pastoral knowledge (traditional classification/taxonomy of livestock, ungulates, birds of prey, medicinal herbs, etc.);
- Traditional knowledge about tending to flocks, treating livestock illnesses, carrying capacity of various landscapes);
- Knowledge related to the sustainable use of natural resources (traditional classification of pastures, pasture condition indicators, ways of improving pastures, etc.).

Fikret Berkes (2012) defines traditional ecological knowledge as "a cumulative body of knowledge, practice and belief, evolving by adaptive processes and handled down through generations by cultural transmission, about relationship of living beings (including humans) with one another and with their environment" (2, 7). The key concept proposed by Berkes is a notion of knowledge-practice-belief complex, which emphasizes that traditional knowledge is accumulated over millennia; it is tied to a certain locality and

often contains spiritual component.

3. Enduring Traditions

Kyrgyz people in Murghab use several terms to refer to their land such as *Sarykol* (Yellow valley, grass growing there gives the valley a yellowish color), *Soorlu jer* (Land of lush pastures), and *Kotozdun mekeni* (The home of Yaks).

Arid and harsh continental conditions of Murghab made it impossible for Kyrgyz people to grow crops and develop agriculture, which made herding the primary livelihood of Kyrgyz nomads. 19th century sources described Kyrgyz herders of Eastern Pamir as following: “Kyrgyz in Pamir are typical nomads… as opposed to other Kyrgyz people in Turkestan who sometimes become sedentary, it is impossible for Kyrgyz in Pamir to settle down because the only viable livelihood is herding” (3, c. 44-45). The description of Kyrgyz pastures also mentions “Kyrgyz people living exclusively off their flocks and flocks” (4). People living in Sarykol valley “do not do any crop farming. They do not make dough and bake grain bread. Whenever they get some flour, they add it in their stews” (5, c. 229). While noting the absence of crop farming, the travelers pointed out that “Kyrgyz people engaged exclusively in herding” (6, c. 149).

Year-around migrations between seasonal pastures prevented the land degradation on those pastures. This practice was developed based on century-old observations and practice of Kyrgyz nomads, sustainable use of resources, and constant adaptation to local conditions. Seasonal migrations entailed some rules to be observed by the Kyrgyz nomads with the aim of sustaining the main source of wealth, that is the livestock. Thus, depending on the season, herders migrated to the mountains, gorges or went down to the valley in the winter.

A. P. Fedchenko (1844-1873), a Russian geographer and biologist, who explored Pamir noted the absence of Kyrgyz people while he was travelling through lush valleys. He explained that Kyrgyz people “leave grass in the vicinity of roads to be consumed by their flocks during the downward migration…” (6, c. 140).

Murghabi Kyrgyz knew well peculiarities of local soils and vegetation of Eastern Pamir. Year-around transhumance grazing and seasonal migration practices were based on the knowledge of vegetation types and their cycles on saline, stony, and loamy soils.

Pastures were selected based on the knowledge of soil types, vegetation, water sources, and other natural factors such as direction and intensity of wind, weather change patterns, etc. The very natural conditions stipulated the seasonal use of pastures. Seasonal division of pastures corresponded to the vegetation cycles on those pastures and coincided with the time when the vegetation on the pasture matured.

All the stages of seasonal migrations were interconnected. Each step in the migration cycle opened the possibility to proceed to the next step and ensured successful operation of such system. Traditional knowledge ensured long-term use of renewable resources and preservation of pastures to be ecologically sound for the generations to come.

The results of the surveys and the focus-group discussions showed that traditional knowledge still plays a great role in local livelihoods of Kyrgyz people in Murghab district. Nonetheless, there are some changes to traditional rules and grazing practices. The calendar for seasonal migrations is not always followed, which has led to overgrazing in adjacent pastures and to degradation of pastures and decline in biodiversity. Remote summer pastures are under less pressure, however, growing number of livestock poses some threats to fragile ecosystems of the Eastern Pamir.

The survey conducted in 6 villages of Murghab district (GBAR) showed that 93% of respondents answered that traditional knowledge is used in herding practices. The analysis of the responses allows concluding that traditional knowledge is highly appreciated and used in modern herding.

Traditional ecological knowledge reflects not only Murghabi Kyrgyz people's knowledge about the land, animals, birds, and vegetation but also reveals the essence of human-nature interactions. Empirical observations on nature, animals, and plants have been put into practice, the results were monitored and stored in people's "knowledge bank." That was how ecological accounts of human-nature interactions got accumulated. Ecological knowledge on nature and land corresponded with local environmental conditions and served as a basis for survival, adaptations, and prosperity strategies.

A. P. Fedchenko and B. A. Fedchenko (1915) studied high-altitude vegetation and soils of Eastern Pamir, which is a mountain desert in its essence. B. A. Fedchenko notes that "Turkestani sands are rich in calcium, which is vitally necessary for plants" (7, c. 794). This, in turn, defines the quality of vegetation. Particular soils of Eastern Pamir defined the types and quality of vegetation.

Kyrgyz proverb says "a sheep eats a thousand flowers a day." Herders knew what types of plants are consumed by different species of domestic animals. Kyrgyz people in Murghab have a rich traditional taxonomy of plants and shrubs, which is an evidence of deep knowledge about local vegetation. The large taxonomic groups were forage plants; plants, which are poisonous for various animals; medicinal plants and herbs; plants used for firewood.

The local place names (hereafter referred to as ethnotoponyms) are the most ancient geographic names. Ethnotoponyms reflect the territorial distribution of Kyrgyz nomads, their empirical observations on natural phenomena and processes, unique natural landscapes, local livelihoods and everyday life as well as events related to particular places and people. The local place names have many legends and stories attached to them, which have been preserved in oral history.

4. Landscape-Centered Ethnotoponyms

Kyrgyz people in Murghab district have ethnotoponyms that highlight the unique features of natural monuments and landscapes. Swen Gedin, a Swedish traveler who visited Pamir in late 19th-early 20th century noted that Kyrgyz and Tajik people had their own local names for the same areas, e.g., "the upper streams of the rivers flowing to west have Kyrgyz names, whereas lower stretches of the same rivers have Persian names" (1899, 8, c. 137).

Ethnotoponyms contain traditional ecological knowledge of Kyrgyz people about their land which has been transmitted through generations. Transhumance livelihoods of Kyrgyz nomads required long distance migrations, detailed geographical knowledge and multitude of place names. Place names contained unique features distinguishing them from other similar geographic objects such as mountains, valleys, rivers, lakes, etc. Landscape-centered ethnotoponyms contain information about terrain features, peculiarities of vegetation, soil and water bodies, etc.

Landscape-centered place names do not contain information about people and their livelihoods but rather describe shapes and sizes of terrain and other unique features of the environment. Landscape-centered ethnotoponyms often reflect the *color* of the geographic object and information about *rocks and minerals*, etc. These color codes distinguish a particular object from other similar ones. Among the local place names of Kyrgyz people in Murghab, the most frequently used colors are white, black, red, and grey. For example, the

following ethnotoponyms contain the "ak" (white) color marker: Ak-Zoo (White Rock), Ak-Jar (White Cliff), Ak-Kyia (White Slope), Ak-Sai (White Valley). The place name of Ak-Tash (White Stone) also contains information about the limestone formation on that place. Chakmak Dong Mountain (Silicon Hill Mountain) located on the left bank of Ak-Suu river, is named after silicon (12).

In the book *Journey to Tukestan* (1875), A. P. Fedchenko (1844-1873) explains the meaning of ethnohydronyms in Pamir (that is the names of lakes and rivers and other hydronyms used by local ethnic groups living in the area—*author's comment*). For instance, Fedchenko explains that the hydronym Kyzyl-Suu River (Red Water River) "came about due to the red-colored waters of the river. Abundant red rock formations throughout Alai got diluted in Kyzyl-Suu waters and give it a red color. Kok Suu (Blue water) has clear waters, whereas Zank-Suu (also known as Ylai-Suu, which means Muddy River) have muddy waters" (6, c. 147-8). Local informants also confirmed that it was the color of water that determined the name of the rivers containing such words as "kyzyl" (red), "kok" (blue), "ylai" (muddy or turbid).

Some ethnohydronyms (e.g., lake names) also contain information about water quality, e.g., information about water taste and odor. British traveler G. Bonvalo noted in his observations the large amount of lakes in Eastern Pamir. He points out that these lakes are called "Sasyk-Kol—a Stinky Lake, and Tuz-Kol—a Saline Lake)" (9, c. 162-3).

Ancient Chinese traveler Juan Jan described the Karakol (the Black Lake) as a Dragon Lake (1, c. 765). Based on Chinese sources, Ritter states that "water in the lake is fresh and pleasant to drink; it is clean and glitters as a mirror, although the surface looks dark green" (5, c. 237). Karakol Lake is located high in the mountains at the altitude of 3,900 meters a.s.l. Local people say that the name of the like comes from its color. The unique feature of the lake is that transparent water of the lake becomes black when strong winds create waves.

Other lake names also contain information about the surrounding landscapes, e.g., Yran-Köl (Beautiful Lake), Jashyl-Köl (Green Lake), Aidyn-Kol (Lunar Lake), etc. Dünküldök Lake was named for the "dünk" sounds coming up from its bottom. According to locals, there are holes at the bottom of the lake where water flows and then returns. The lake makes deep short sounds audible during strong winds.

Names of other rivers in Sarykol Valley such as Ak-Suu and Kara-Suu convey the traditional classification of lakes based on observations of river cycles, water sources (glaciers, ground water), taste, and composition of water. Swedish traveler Gedin mentioned Kara-Suu in his work: "the Kyrgyz took as through the small hills along the Kara-Suu River (Black River). It is called black because the river is fed by springs and the water is so clean that seems almost black in deep places" (8, c. 105). D. I. Mushketov (1886) mentions Kyrgyz hydronyms Ak-Suu (White water) and Kara-Suu (Black Water) and when describing the water arteries of Turkestan distinguishes "regular and glacier-fed rivers or white and black rivers" (10, c. 25). She explicitly states that such classification stems from Kyrgyz nomad's views. Kyrgyz nomads observed river sources, its cycles and composition. Based on this knowledge, herders adjusted migration routes and length of stay at a particular pasture.

There are local names of landscapes, which reflect people's *worldview and spirituality*. Everyday life of Kyrgyz nomads contained a number of rituals and rites, which were believed to play a great role in preservation of family and the tribe, ensuring livestock fertility and successful hunt, etc. There was a belief that those, who don't take care of their land and livestock, lose patronage of spirits. Kyrgyz people in Murghab revered sacred sites. According to beliefs, the guardian spirit of a sacred site punished those who violated the norms of ritualistic and everyday life behavior and favored those, who respected the rules.

S. Gedin mentions the guardian spirits of harsh mountain passes in Eastern Pamir. He notes that when passing the Kyzyl-Art mountain pass, the guides stopped at the highest point of the pass to show their reverence towards the sacred site. It was a burial place of a saint. A sacred site had a pile of stones with wooden poles. The poles were decorated with votive rags and horns of ungulates. The sacred site was a burial place of a saint who opened the Kyzyl-Art mountain pass. Had he not done so, there would have been no path to Pamir. The story has it that Kyzyl-Art had six saint brothers—Muz-Art, Kök-Art, Khatyn-Art, Kalyn-Art, Gez-Art and Ag-Art… "Art is one of many Kyrgyz words that mean a pass" (8, c. 111-2).

Reverence towards sky, earth, water, mountains, and other elements of nature was enacted through conduct of magic rituals, prayers, and other actions symbolizing the power of each natural phenomenon and object.

The fieldwork revealed that Kyrgyz people in Murghab preserved the ancient tradition of visiting and revering sacred sites. The practice of visiting sacred sites exists nowadays despite state-led struggle against sacred sites during the Soviet time and active Islamization in post-Soviet era. Survey revealed that there are many sacred sites in Murghab district, most of which are sacred natural sites such as lakes, caves, mountains, intricately-shaped boulders, springs, etc. Rituals conducted on sacred sites are done for healing, cleansing, well-being as well as rituals for revering spirits of the ancestors, etc.

Sacred sites remain to be the places of kinship, where a person feels his/her connection with land and establishes a unique spiritual bond with it. Modern traditional practitioners such as healer, seers, etc., preserved their belief that every mountain, river or cave has a guardian spirit. They say "koldoochusu bar," which means (this place) has a guardian spirit. The guardian spirit could be seen in a form of a person or animal or bird, etc. For instance, the guardian spirit of Ak-Balyk Lake (located nearby Murghab—author's note) was white fish. Elderly people strictly prohibited fishing white fish. Violation of prohibition could have caused punishment in a form of illnesses, sorrow, and death (12).

Thus, sacred sites did and still do have both environmental and spiritual elements to them, while ethnotoponyms have preserved valuable information transmitted from generation to generation.

5. Ethnotoponyms Related to Herding

Ethnotoponyms of Kyrgyz people in Murghab reflect their main livelihoods, i.e., herding. As a result many names of localities, gorges, mountain passes, etc., are related to domestic animals such as sheep, yaks, and horses. Livestock provided everything needed for local's lives such as food, clothing, and other items. Ethnotoponyms also reflect the traditional classification of the domestic animals based on their age, sex, and phenotype. E.g.: Ak-Kozu (White Lamb), Aryk-Kochkor (Lean Ram), OguzAgyl (Oxen Stall) (12).

Local place names contained information about a particular site and this knowledge was communicated through generations. Local legend has it that a place called Ak-Shyirak (ak is white, shyirak is a lower leg) was a pasture where numerous white-legged yaks of a local rich person grazed. There is a mountain pass Koi Tezek (Sheep dung) located 4,270 m.a.s.l. Locals say that this place has very good vegetation so that sheep fatten up quickly when passing through this pass. Sheep leave behind plenty of dung which was the reason for naming this place Koi Tezek.

A. P. Fedchenko was an ethnographer, anthropologist, and a member of the Imperial Society for Natural Sciences. In his book *Journey to Turkestan*, he relays the story of Karakazyk summer pasture (Kara-Kazyk is a proper spelling—author's note):

> Karakazyk is considered by the Kyrgyz to be a bad summer pasture. Kara means black and Kazyk is a small metal pole, which is pushed into soil and which is used to tie the horses on a long rope for a night. This allows a horse to graze overnight or during a stopover; … in this area, a horse tied to a pole won't find enough forage. (6, c. 120)

This ethnotoponym contains the characteristic of a particular summer pasture such as vegetation quality, time of use, and previous grazing experience.

Murghabi Kyrgyz's knowledge about peculiarities of high-altitude arid landscapes was accumulated as a result of many centuries of observations and practice. This knowledge is reflected in local place names as well as stories and legends. Traditional knowledge holders say that a place Kok-Ichegi (Blue Intestines) is called so "because livestock grazing here doesn't fatten up, however, the livestock's bones get stronger. Soil here contains many minerals that contribute to the bone quality" (12).

Many toponyms of Kyrgyz people in Murghabare connected to horses. The following place names show that horses occupied a significant role in nomads' lives. E.g., there are such places as At-Jailoo (summer pasture for horses), Ak-Baital (white two-year old mare) mountain pass, At-Oldy (a place where a horse died), Shiber-Aigyr (shiber means tall lush grass, aigyr means a stallion), Kuluk (a fast horse). Horses were the main means of transportation in harsh mountainous conditions. Nomads love towards horses was reflected in the Kyrgyz proverbs: at adamdyn kanaty (a horse is a person's wings), at syilagan jöö baspait (one who respects horses, never walks on foot—author's translation), aty joktun butu jok (one who has no horse, has no legs). There is a sacred site Tulpar-Tash in the place called Bash Gumbez (Murghab district, GBAR). Tulpar is mythical horse with wings and tash means stone. Local people revere this stone, which has a horse's clear hoof print (12).

6. Ethnotoponyms Related to Hunting

Abundance of wild animals in Eastern Pamir created favorable conditions for hunting. Traditional hunting of Kyrgyz peoples in Murghab has been one of the most ancient livelihoods, however, it has never been the main source of food. Hunting was an auxiliary livelihood during harsh winters and livestock murrain. The hunting practices never thwarted natural equilibrium. Over the centuries, Kyrgyz people developed rules of hunting that contributed to nature conservation. Hunters observed certain norms and taboos while hunting with rifles, wooden, and metal traps and snares. The main animals for hunting were mountain goats, mountain sheep, wolves, and bears, etc.

For Kyrgyz people in Sarykol, hunting was necessary for surviving during harsh winters. The prey was used for food and clothing. Even Marko Polo mentions "people in Pamir, who live on the mountain tops, hunt and wear cloth made of animal skin. There are amazing animals such as enormous wild sheep with giant horns" (10, c. 63). Kyrgyz people of Pamir were unchallenged hunters (8, c. 105), who knew all about hunting gorgeous mountain sheep and mountain goats.

Kyrgyz hunters impressed everyone with their hunting skills, "Kyrgyz people are unmatched while hunting mountain sheep and goats. From dawn till dusk they [the Kyrgyz] climb the cliffs over abyss chasing the prey… Kyrgyz people seldom miss the shot" (11, c. 79).

Names of some wild animals are reflected in toponyms of the Kyrgyz people in Murghab: E.g., Ak-Arkar (White male mountain sheep), Ming-Teke (Thousand mountain goats), Bodo (a year old calf of wild ungulates, which is independent from its mother). Some place names convey information about what kind of animals are present there, e.g., Boru-Jylga (Wolf den), Aiu-Jolu (Bear path), Boru-Korgon (Wolf Castle), Koiondu (a place with many hares), Ak-Balyk Köl (White Fish Lake), Turumtai Köl Lake (Pigeon-hawk Lake) (12), etc.

Kyrgyz people hunted ungulates (such as mountain goats and sheep, deer, and roe) as well as marmots, bears, wolves, etc. There is a place called Tuzakchy (tuzak is snare). Tuzakchy is a hunter who used snares for marmots and hares, etc. A place got such a name because of abundance of game and as a result of the abundance of hunters with snares.

There is a legend about a place called Gor-Tuzak. Sarykol valley was abundant with innumerable amount of wild ungulates, which made all men wonder. Hunters trapped and hunted them. Long time has passed ever since, but the folk memory preserved the legend and the name Gor-Tuzak (12).

Microtoponyms (small place names—author's note) preserved the names of herders and hunters as well as stories related to those places. Such toponyms consist of two parts: (a) the name of a person and (b) the word "korgon" (a sheep fold). Thus, places are named after people who grazed their sheep flocks in a particular place and had sheep folds there. E.g., Kutbaidyn-Korgonu (Kutbai's sheep fold), Saparbektin Korgonu (Saparbeks' sheep fold), etc. Sometimes microtoponyms of the pastures are named after the owner of the flocks and the pastures, e.g., Myrzabektin jaiyty (Myrzabek's pasture), Shygymbettin kyshtoosu (Shygymbet's winter pasture). Some microtoponyms carry the names of the renowned hunters. For example, there is a story of Shamaamat who lived in Shinde area. The story has it that he managed to enclose a herd of mountain sheep in between high cliffs. Kyrgyz people in Murghab call this place Shamaamattyn kamoosu (Shamaamat's enclosure). Similarly, Ashirgalcha cave was named after famous hunter named Ashirgalcha. He was known to support the whole community by sharing and distributing the game we hunted. There is a small cave on the Kokui-Bel mountain pass nearby Karakol Lake, which was named after Ashirgalcha by the locals (kyrg. Ashirgalchanun kürü) (12). These legends preserve the stories of renowned people of those times.

7. Conclusion

The study of ethnotoponyms of the Kyrgyz people in Murghab helps us to better understand human-nature interactions and specific practices of the nomadic cultures. Old stories and legend that exist nowadays can be included into historical and cultural encyclopedia of traditional ecological knowledge. Ethical and moral norms formed in individual and collective consciousness carried educational functions by transmitting social and moral taboos, behavioral patterns, which played a key role in socialization and understanding of human-nature unity.

An ecological paradigm of the traditional culture was built upon sacred sources, reflected in unity and equilibrium of the spiritual and the material. Constant adaptations of Kyrgyz people to the mountainous environment as well as transhuman livelihoods and hunting shaped perceptions and thinking of the Kyrgyz nomads. Such perception and thinking maintained harmonious relationship with nature, ensured conservation of nature and transmitted traditional ecological knowledge and experience from generation to generation.

This supports concepts of western scholars (2) that claim that TEK is present in many formats such as worldviews, religions, beliefs, ethics and proverbs, legends, and stories. They carry ecological perception and culture, which in turn defines livelihood and management models. The survey showed that 24% of respondents identified the loss of spiritual values and ancestor's traditions to be one of the main reasons for environmental degradation, 42% of respondents named economic hardship and low living conditions, 10% named weak law enforcement and 24% identified "other" as a main reason for degradation (12). Survey and the focus group results allow making a conclusion that local people understand that spiritual and ethical norms are the backbone of the ecological culture.

Ecological knowledge and culture have deep roots in Kyrgyz culture. They are not invented but rather accumulated through generations. Caring and considerate attitude of Kyrgyz people towards the environment and its resources ensured survival, harmonious human-nature interactions, preservation of favorable environmental conditions, thus ensuring the well-being of the generations to come. Such strategy gave us a natural and cultural heritage as a gift from our ancestors to the current generation of people.

The main conclusions of the field research are:

- Traditional ecological knowledge of Kyrgyz people in Murghab (technologies, practices, and worldview) is a result of collective learning and adaptation to the environmental conditions of Eastern Pamir over thousands of years. TEK was based on practice and transmitted from generation to generation and became a part of ethnic culture of local Kyrgyz people;
- A holistic system of traditional livelihoods of the Kyrgyz people in Murghab consisted of creating unique ethnocultural landscapes with year-around transhumance migration of people and flocks. Pastures were classified and used in accordance with seasonal features, vegetation cycles, terrain as well as soil and water characteristics;
- Along with traditional knowledge, practices, and technologies Kyrgyz nomads developed a holistic system of spiritual and moral values, patterns of behavior, beliefs, and customs that ensured preservation and cross-generational transition of TEK. The core of TEK was the idea of responsibility and care for their Land;
- TEK of the Kyrgyz people in Murghab reflects their knowledge of natural landscapes of Eastern Pamir, its flora and fauna. TEK reveals the humans' connection to land and serves as a strategy for survival, adaptation and well-being. Environmental thinking is the core of traditional culture that ensures self-preservation;
- Traditional ecological culture still plays a significant role in livelihoods of local people in Murghab district and is connected to the environment and spirituality. They ensure cooperation and co-management for local communities and entail meaningful spiritual and moral contexts for preservation of ethnic culture and identity;
- Human-nature interactions, unique features of local landscapes, nomadic practices and experience have been preserved in ethnotoponyms of Sarykol valley. The local language of Kyrgyz people in Murghab preserved elements of ancient Kyrgyz nomadic culture and history as well as old legends and stories. These stories along with ethnotoponyms can be included into a cultural encyclopedia of TEK. It allows tracing cultural and ethnic evolution of Kyrgyz in Murghab by examining their symbolic system of spirituality and culture.

Worldview, wisdom, and certain way of living helped Kyrgyz people survive through different times over the span of thousands of years. Both scholarly circles and broader audience gradually come to understanding that anthropogenic negative impact on the biosphere cannot be restored only via use of advanced technologies and rational approaches. A new ecological culture, the roots of which can be found in traditional ecological culture of our ancestors is needed to overcome the environmental crisis and to restore the balance in the environment.

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