ANTHROPOS

105.2010: 423–439

Loplyk Fishermen

Ecological Adaptation in the Taklamakan Desert

Sabira Ståhlberg and Ingvar Svanberg

Abstract. – The Loplyks form a small ethnic group previously settled at the Lop Lake (Lop Nor) in the Tarim Basin. With an economy based on fishing, this semi-nomadic Turkic group adapted to the arid conditions and scarce biological resources at the fringe of the Taklamakan desert. In the late nineteenth century, foreign travellers observed that they could fulfil most of their material needs through the use of available plants, animals, and fish species. Anthropogenic pressure and climate change have dried Lop Nor and forced the Loplyks to turn into farmers. This article discusses their adaptation strategies from an ethnobiological viewpoint. *[Xinjiang, Loplyk, fishermen, hunter-gatherer, ecological adaptation, ethnobiology, adaptation strategies]*

Sabira Ståhlberg, Ph. D. (Bonn, Central Asian Studies); M. A. (Helsinki, East Asian Studies). – Independent researcher and lecturer. – Major publications: Der Gansu-Korridor. Barbarenland diesseits und jenseits der Großen Chinesischen Mauer (Hamburg 1996), The Gansu Corridor. An Ethnic Melting Pot (in: T. Atabaki and J. O'Kane [eds.], Post-Soviet Central Asia. London 1998). – See also References Cited.

Ingvar Svanberg, Senior lecturer at Södertörn University, Flemingsberg and Uppsala University. – Major publications: Kazak Refugees in Turkey. A Study of Cultural Persistence and Social Change (Stockholm 1989), China's Last Nomads. The History and Culture of China's Kazaks (Armonk 1998), Contemporary Kazaks: Cultural and Social Perspectives ([ed.] Richmond 1999). – See also References Cited.

Introduction

The study of hunters and gatherers has experienced a rebirth in recent decades. However, very few groups of forager cultures in the Eurasian desert areas receive attention (cf. Murdock 1968; Barnard 1983). Among the most neglected are the Loplyks in the Tarim Basin in northwest China. Like many other hunter-gatherer peoples, the Loplyks have given up their traditional foraging culture during the past century and are now integrated with their peasant neighbours. Thus, it is only with the help of nineteenth-century and early twentieth-century travel narratives, recorded toponyms, and historical and linguistic material that we are able to understand the hunter-gatherer way of life and foraging cultures in marginal ecological settings of Eurasia.

One of the most difficult Central Asian areas to access is the Tarim Basin and its Taklamakan desert. The huge basin and the forbidding desert form the largest depression of this type in the world, covering approximately 45 per cent of the area in Xinjiang Uighur Autonomous Region, P. R. China. The Taklamakan itself covers some 370,000 square kilometres. Spread like a horseshoe along the Tarim Basin lie numerous oasis cities and villages, starting from Korla on the northern tip around to Kashgar and Yarkand in the far west and continuing down to Khotan and Keriya in the south. The open end of the horseshoe is the site of Lop Nor (Mongolian: *nor*, "lake"), once a great salt lake overgrown and surrounded by marshland and reeds. Today Lop Nor has dried up and hosts the world's biggest defunct nuclear testing base.

In these challenging surroundings, humans have adapted to the ecological conditions for centuries. A tiny, Turkic-speaking group called Loplyk or Loplik (Turkic: "Lop people") lived mainly on fishing, hunting, and gathering along the Tarim rivers and Lop Nor until some decades ago (Svanberg

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

1996). Lop Nor carries its modern name since the thirteenth century, but oases settlements such as Loulan and Miran have been recorded in Chinese sources at least since the Han dynasty (206 B.C. – A.D. 220). Archaeological expeditions have discovered even older settlements and burials with perfectly preserved Indo-European mummies (see Bergman 1935). The previous settlers have, however, little or nothing to do with the Loplyks, except that Loplyks were the guides who brought Western explorers to the ancient sites. Descendants of fishermen Loplyks still live in the region of the Tarim Basin, but have turned into farmers and herders and are considered to be Uighurs like the majority people of the area.

Few marshland people in Eurasia are comparable with the Loplyks. A well-known example is the so-called Madan or Marsh Arabs in Iraq (Thesiger 1964). Similar arid conditions and a slow, continuous drying up of the region, like the one in which the Loplyks lived can be observed in the Aral Sea environment, together with the complex ecological and lifestyle changes local people have been subjected to (cf. Zhdanko 1961). The Barabin Tatars in the Baraba steppe, western Siberia, led a largely similar fishing-based lifestyle as the Loplyks, but lived in a much more humid climate with forests and abundant water in rivers and lakes (Svanberg 1987; Ståhlberg and Svanberg 2006). In Europe, the Pákász lived in the marshes of the Great Hungarian Plain, also subsisting mainly on fishing (Gunda 1949). It seems that only in Africa the marsh and lake dwellers (for instance, the fishing Kenyan Elmolo people) are able to continue their traditional lifestyle, however, under heavy pressure from their agricultural and herding neighbours (Sobania 1988).

The purpose of this study is to describe and analyse the utilization of the scarce biological resources that the ecological framework provided in the Lop area about a hundred years ago. It discusses the adaptation strategies of the Loplyks to the specific environmental conditions and the aridity of the Tarim Basin, as well as their ways of fulfilling their material needs. Both the adaptation strategies and sustainable practices are of great importance today, especially in Xinjiang and northern China, where desertification, salination, and degradation of soil are advancing at a fast pace.

Methods and Sources

"We have practically no information on fishing in the southern parts of Xinjiang," writes Swedish Turkologist Gunnar Jarring (1998: 8) in an article on agriculture and horticulture in Chinese Central Asia. He concludes: "There are only stray notes in the reports of the early explorers." The Loplyk fishing and gathering culture, which is described here, started to disappear at the end of the nineteenth century. Naturally, a fishing-hunting-gatherer way of life leaves few traces behind. The Loplyk fishermen represent a now lost way of life and we can no longer approach them through fieldwork. Instead, we have to refer to historical sources and notes, in this case particularly travel narratives. Source criticism is a basic methodological tool also for ethnobiological research. Ethnobiologists explore the relationship between humans and their environment, including the natural resources and their use. There is no principal distinction between ethnobiologists exploring historical contexts and those who have the opportunity to do field studies among contemporary local communities that sustain themselves on biological resources available in the surroundings. We actually use the same sources: popular animal and plant names are an important category and source for information, as are toponyms and of course artefacts, along with the physical legacies of the landscape itself. Last but not least, the existing flora and fauna bear evidence of human activities.

Yet the ethnobiologist who studies, e.g., human and biological resources in a historical setting differs from the contemporary field researcher in that the student of historical contexts is not able to do interviews or observe on-the-spot activities. Instead, the ethnobiologist-turned-historian relies on narrative sources that may provide, at best, also such information which cannot be extracted from plant names and toponyms. Narrative sources, for example, travel descriptions, topographical depictions, diaries, memoirs, fauna, and flora are, therefore, useful. Here we find descriptions and information on the perceptions, which we can expose to interpretation. In the case of the Loplyks, there are several travel reports and other narrative sources from Russian travellers like Nikolai Przhevalskiy (also written Przewalski) and Mikhail Pevtsov, and Western explorers such as British Aurel Stein and Swedish Sven Hedin, who also give ethnographic information about the Loplyks. A few of these visitors give rather detailed information. Other sources are scarce and contain mostly scattered notes.

The primary interest in the nineteenth century was geography and special attention was given to the strange phenomenon of the Tarim depression. Przhevalskiy's observations from his first visit in 1876–1877 took geographers by surprise. They could not, for instance, understand why there was

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

sweet water where the Tarim River encountered the salty Lop Nor. Revisiting ten years later, the Polish-Russian explorer could verify his previous observations. He now found a lake overgrown with reed and "of no great depth." The humans, he noticed, lived still a primitive life based on the lake (Przhevalskiy 1885). From this point on, the Loplyks existed in travellers' accounts and enjoyed some attention.

When discussing source criticism, it must be kept in mind that the explorers were foreigners with other goals, often just passing through the Lop landscape, although a few of them stayed in Loplyk fishing villages for a time. Also their expedition members were foreign to the region. Some originated in India, like Stein's assistants; others came from oases around the Tarim Basin or even from distant parts of Central Asia or China. Only Sven Hedin spent a whole winter among the Loplyks and returned to the Lop area several times.

In the travel narratives the personal dimension plays an important role. Some Loplyks became friends with the travellers, among them Tokhta Akhun, who first helped Hedin. Later this same elderly man, who was instrumental in finding several ruins and ancient graves in the desert, worked with Stein, American Ellsworth Huntington and Japanese Zuicho Tachibana (Stein 1916: 121). Another such person was Ördek, 72 years old in 1934, when Hedin for the last time visited Lop Nor. Still there was a gap between locals and explorers, often due to the attitudes of the foreigners. Many Loplyks liked Hedin and wanted to be of service to him who appreciated their help in return, but he kept them at a distance. On the one hand, Hedin trusted Ördek even when the old man was unable to locate a cemetery he had spotted earlier in the desert (Bergman 1935: 44). The trust was based on Hedin's positive experience – during a previous journey around 1900, Ördek was efficiently employed to organise fodder, wood, water and other supplies for the expedition. On the other hand, when Loplyks eagerly visited Hedin and his followers, bringing gifts and information, the Swede kept to his tent and noted that the camp "resembled a marketplace" (Hedin 1954: 288f.).

The deep-rooted conviction of white man superiority must also be taken into account. Several explorers thought the Loplyks, "like all Turki" (inhabitants of Turkestan, now Uighurs in Xinjiang) were born liars. Stein (1916: 117) describes the Loplyks as easygoing, "with indolent begs" (chiefs). They were, however, tough workers, accustomed to desert conditions, but had scanty resources and "a natural bend towards passive resistance" and evasive cunning. Folk beliefs were not looked upon with interest but classified as superstition and, therefore, ridiculed. When a sandstorm caught Stein and his workers in the desert, the Loplyks assumed it was the wrath of the dead whose graves they had disturbed while doing archaeological excavations (Stein 1916: 120, 125).

Ördek, when not finding the mentioned necropolis, told Folke Bergman (1935: 45) that the place was so infested with *iblis*, devils, that he did not take the responsibility of conducting anybody there (finally, though, they found the spot). These cases and others were "proof" of the primitive nature of the Loplyks. Yet even Stein had to acknowledge the help of Tokhta Akhun and "the sincerity of their honest Mongolian faces" as the Loplyks wished the explorer a good journey (Stein 1920: 8).

In terms of sources, as far as we know, very few tools and implements, if any, have survived from the Loplyks. Linné (1935: 168) asserts that the "rather primitive natives of the Lop-nor district are also represented, e.g., by fishing implements" in the Sven Hedin collection of the Ethnographical Museum in Stockholm. The authors of this article have not been able to verify the information despite efforts. Yet photos and drawings, especially sketches made by Hedin, give us an extraordinary opportunity to see what the material culture of the Loplyks looked like, at the turn of the last century. The pictures are complemented by the narratives.

Linguistic documentation exists today thanks to a few travellers and particularly a skilled Russian Turkologist, Sergei Malov, who published texts and a dictionary of the Loplyk language (1933, 1956). Another important source for our understanding of the lifestyle and economy of the Loplyks are their toponyms. Sven Hedin gathered many place names in the vicinity of their habitat which reflect in a concrete way the human exploitation of the landscape. Hedin's rich records have been analysed by Turkologist Gunnar Jarring (1997). They contain a vast range of traditional ecological knowledge, including the geographical concepts of the Loplyks. This small group of marsh dwellers had an elaborate terminology of geographical phenomena, mainly (and naturally) concerned with hydrography. The Loplyks were also quick in adapting their geographical knowledge to new situations. A house built for Hedin was immediately called Turasalgan-uj (The house built by the Great man). They told him that the name would be used from that moment onwards, just like another, Urus-salgan-sal (Where the Russian built a raft), a place where Russian explorer P. P. Kozlov crossed the river (Hedin 1954: 292).

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

Several songs, fairy tales, and some riddles and proverbs have been recorded by Malov (1956) and published in the original language. Yet another, much earlier traveller had already recorded folk songs among the Loplyks. Prince Henry of Orléans heard an old woman accompanying herself with a two-stringed lute, *duta*, singing a song about the origin of the villagers of Eutin, and he provides a translation of the song. This traveller did not speak any Turki himself, so he had to rely on interpreters (Bonvalot 1891: 97f.).

Sven Hedin, who spoke and understood Eastern Turki fairly well, spent part of the summer in 1900 recording "some of the best-known songs which had been sung for a hundred years or more by the sons and daughters of the Lop country; besides which, I also preserved some new ditties which were sung by the fishermen of Kara-Koshun." In the village of Abdal, he collected songs of the "poor but interesting fisher-folk who dwell there." The songs were written down in Turki, but unfortunately the original texts have never been published. They are still preserved in the Hedin collection in the National Archives, Stockholm. Translations of the songs, however, are given in his description of the expedition to Central Asia and Tibet in 1899–1900. As Sven Hedin himself noted, "they lose a good deal in translation, and sound immensely better in the original Turki, with its rugged, rhymed, and rhythmical cadences, sung to a monotonous tune twanged on the strings of a dutara" (1903a: 442; 1903b: 234).

Loplyk Origins, Settlements, and Numbers

The origin of the Loplyks remains obscure – actually, nothing is known. The people of the group known as Loplyk (self-designation Loptïq) were distributed mainly along the southern edge of Lop Nor. Although they nowadays are regarded as a sub-group of the Turkic-speaking Uighurs, they most probably have a separate background, distinct from the oasis dwellers in their vicinity. Stein (1912: 342) described the Loplyk vernacular as different from the other Turkic dialects in the region. He noticed that it was sometimes difficult for his workers from Yarkand and Khotan to understand Loplyks. Malov (1933) was of the opinion that Loplyks, together with Sary Yögurs (also called Yellow Uighurs) in nearby Gansu province, are of ancient Kirghiz descent, a people who had their homeland in the upper Yenisei tributaries in the ninth century. He made his conclusion based on the linguistic peculiarities dividing the Loplyk vernacular from other Eastern Turki dialects. Jarring (1934: 191), in his commentaries on Malov's text samples published in the 1930s, stressed its resemblance to Kazakh. He did not speculate, however, on the origin of the Loplyks. According to Pevtsov (1949: 234), the Loplyks themselves told stories of how they had migrated from northern Kashgaria some four hundred years earlier. Huntington (1907b: 144) was told by Loplyks that their forefathers came to Lop Nor two or three hundred years ago, which would loosely mean seventeenth century – in Loplyk timescale, "when the lake and the river were bigger." Mongolian Kalmyk or Turkic Kirghiz origins of the Loplyks have been suggested by several authors (Forsyth 1875: 51; Stein 1921: 335).

Przhevalskiy (1885: 808) thought the Loplyks were "a Mongolian-Turkish race." Their ancestors, according to his informants, were called Kavria and lived in the town of Lop the ruins of which were found south of the lake. At the end of the fourteenth century the town was destroyed and only a small number of inhabitants saved themselves by hiding in the reeds, becoming Loplyks in time. On the other hand, Huntington (1907a: 68) met three Loplyks in the village of Abdal who were of "a fair-skinned, dark-haired mixed race of Aryan and Mongol origin," talking a Turki dialect and dressed like other Turkis in quilted cotton tunics that reached below the knee, high leather boots, and fur-brimmed caps.

It is difficult, if not impossible, to find evidence of the origin of the Loplyks. Their physiognomy was found to be much closer to Mongolian and Chinese than to their Uighur neighbours, pointing to a northern origin or Chinese influence, the latter, however, difficult to ascertain. There were some distinct differences between the Loplyks and Chinese which caused a physical anthropologist, after examining measurements made by Stein around 1900, to suggest them to be a very early Mongolian offshoot with contacts to both Uighurs and Chinese (Joyce 1912: 454–468).

The uncertainty of the Loplyk origins is connected to another important question. As we do not know where they came from, it is not easy even to guess if the Loplyks were originally marsh dwellers, or a group that immigrated and changed their lifestyle, due to environmental or human pressure or other reasons. It seems plausible that they were immigrants to the area, as their own stories tell and also because their ethnic composition is foreign to the Tarim Basin. The Lop marshes have been a place of refuge for various groups during the centuries. In 1889, French traveller Gabriel Bon-

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

valot visited the village Aqtarma in the desert not far from the Tarim River, just north of the Lop country. These villagers also lived in reed huts and subsisted on fishing, hunting, and animal husbandry. It is uncertain if they identified themselves as Loplyks, but they spoke a Turkic dialect and claimed to be Kalmyk Mongols by descent (Bonvalot 1891: 63f.).

Pevtsov (1949: 234) pointed out several customs among the Loplyks which were similar to those of nomads in the north. However, several of these customs were new among the Loplyks and can be attributed to the economic changes taking place in the last decades of the nineteenth century. Minority peoples in China during the Qing dynasty (1636–1911) were traditionally administered under the so-called *tuoguan* system, a hierarchy of native officials. In Turkestan the population was ruled by local chiefs (Turkic: *beg*) of various ranks. The Lop country was traditionally administered under the ruler (Chinese: *wang*) of Turpan. In the 1890s, there were nine *begs* in the Lop country (Katanov and Menges 1933: 1222). The Loplyk *begs* inherited the positions from their fathers. The most well-known *beg* in the sources was the ruler of the fishing hamlet or small village called Abdal. His name was Künchiqqan Beg, and he was the host to many travellers, being the owner of one of the few mud huts in the area. He inherited his position from his father, Jaghen Beg, son of the first ruler and founder of the village, Numet Beg (Hedin 1898: 881).

There is reason to believe that social turmoil following the Muslim rebellions in Chinese Central Asia in the 1860s and 1870s contributed to the isolation of the Loplyks. The area was highly marked by wars. The Qing-dynasty general Zuo Zongtang had just recovered the area after a long campaign, carried through with the successful strategy of soldiers growing their own food on the way. When the Manchu dynasty again came to power in Turkestan, changes occurred that influenced the lifestyle of the Loplyks and brought them out of isolation. The most important settlement in the Lop area was a small town called Charkhlik (Ruoqiang). It was established around 1830–1840 as a penal colony with exiles from Khotan (Stein 1928: 170f.). Later also some Loplyks started to move into the town. In 1877, according to Przhevalskiy (1879: 104f.), nine Loplyk households had moved into the oasis. Charkhlik naturally influenced the Loplyks, introducing agriculture and other new forms of economy as well as novelties in technology, contacts with the outside world, etc. With the reinforcement of state rule and the growing importance of Charkhlik, the Lop country became increasingly dependent on the Chinese Amban (Manchu: official, here state-appointed mayor). The town was also the administrative centre for the Loplyks at the end of the nineteenth century (Bruce 1907: 161f.).

How many Loplyks were there? Similarly as with the origins, we do not know. Travellers give various figures, depending on how extensively they journeyed in the Lop area. An educated guess is that the figures fluctuated but kept around 500, with a maximum of 1,000 persons. The Loplyks roamed the river banks and the marshlands of the Lop country, but they lived in small permanent or semipermanent hamlets spread out along the rivers, Lop Nor, and adjoining smaller lakes. The hamlets consisted of small groups of ten to twenty households. According to Przhevalskiy, there were about seventy Loplyk households or a total of 300 individuals in 1877. They were distributed over eleven settlements. Some twenty years earlier there had been as many as 550 households, but a smallpox epidemic had caused a catastrophic decline in the population. Almost ten years later, the same explorer noted that the people numbered "400 souls of both sexes" (Przhevalskiy 1879: 104f.; 1885: 807).

Just five years after Przhevalskiy's visit, in 1890, another smallpox epidemic killed nearly 400 people (not only Loplyks) in the region, particularly the young. Pevtsov (1949: 234) visited at this time and found only 160 Loplyk families left, including the new settlers in Charkhlik. Some 60 households were made up of about 300 town dwellers, while the remaining 100 households counted 500 individuals, mostly Loplyks. Due to the rough conditions under which the Loplyks lived, they had very few children; a family seldom had more than two or three children and many were childless. According to Henry of Orléans, the mortality rate among young children was one in five (Bonvalot 1891: 100).

In addition, regular smallpox epidemics and also emigration decreased the population further. Around 1900, Hedin (1954: 257–280) met ten families in huts of reed and poplar wood at the Istem river (part of the Tarim). The huts were built close together to keep out cold, wind, and heat. All 40 persons, "colourful, in rags and ugly," were photographed. There was among them an old man, 90 years old, who had moved into the area lately from another village. Hedin found houses along the river which looked new, but there was not a living soul to be seen. Later he was told that the people in villages and down the river moved away seven years earlier due to another smallpox epidemic.

In 1905, Charkhlik and Lop Nor hosted a total of 1,200 Chantou (Chinese: "turban heads," Muslims)

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

and Loplyks plus a Chinese garrison (Huntington 1907c: 247; 1907a: 66). Yet Huntington (1907a: 68), who found the Loplyks "gentle, hospitable, self-respecting people who once lived there by the thousands," counted at this time only 250 persons in the Lop area. The reason for the diminished population was the drying up of the lake. This information is important, as it shows that the ecological changes had already affected the population. From now on the environmental situation became increasingly unbearable, supplanting smallpox as the main cause for reduction in the Loplyk population at Lop Nor.

Around 1916, Stein (1925: 393) surprisingly found many more Loplyks, "400 and odd households" in the Lop depression, but they were already "scanty remnants of a semi-nomadic people," fishing and hunting around the Tarim River and the salt-encrusted bed of Lop Nor. In the late 1920s, when British colonel Reginald Schomberg (1933: 132f.) visited the area, he found only scattered Loplyk households living in the north of the Lop country. They were mainly herdsmen, but increasing salination and declining water supply made it difficult for them to survive. Efforts to dam the river to force it to return to its former course had failed. These households, therefore, were ultimately forced to move to Charkhlik or the oasis of Miran.

Also Hedin (1931b: 123) notes that the Loplyks left the Lop basin around 1920, but his informants spoke again of a plague which had caused numerous deaths. In addition, the Tarim River finally changed its position in 1921, and its end lake shifted further northeast. The Loplyks could no longer survive as fishermen and the remaining families migrated to nearby oases. Today descendants of Loplyks live in the villages and towns in the region, mainly in Charkhlik (Ruoqiang), and are assimilated among the Uighurs, with little reminiscence of their earlier settlements and lifestyle.

The Lop Environment

Lop Nor was the end lake for the river system generally called Tarim, which, however, bears different local names for smaller rivers and parts of the big river. Lop Nor was without drainage, which means that no water left the lake except by evaporation. The area was probably much richer and more productive at the time when the ancestors of the Loplyks settled there, but at the beginning of the twentieth century, the climate and the ecological conditions were harsh. January mean temperature was −10 ˚C and July average temperatures ranged from +28 ˚C to +30 ˚C. Sandstorms, *buran*, occurred regularly, sometimes lasting for weeks. A terrible black storm, *kara buran*, surprised Hedin (1903b: 233f.). The expedition was totally lost in a dark dust fog in the middle of the day, the storm coming upon them without warning and whipping up high waves on the river where they floated. Rain is extremely rare in the Lop area, but exceptionally heavy when it comes, often in intervals of several years. Bergman (1935: 51), the excavator of "Ördek's necropolis," experienced torrential downpours twice, in April 1928 and June 1934. During winter and spring, icy winds from the north or northwest swept the area. The ever-present salt dust caused chronic eye inflammation among the inhabitants (compare with the Aral Sea). Furthermore, the precipitation was only ten millimetres yearly, while the evaporation was more than 3,000 millimetres. The Lop basin was one of the most arid areas in the world already a century ago. The Loplyks, however, managed to survive for several hundred years among shrubs and reeds, strong wind erosion, and shifting sands. The lakeside was safe for them, but they told horror stories to explorers about the desert and the lack of water, "… the torture from thirst, the frantic search for water, and final death of the few of their number who have attempted to cross the desert in summer or fall, when the scanty water supply is in most places undrinkably saline" (Huntington 1907a: 65).

Lop Nor was very saline also in 1930–1931, when Nils Hörner and Parker C. Chen of the Hedin expedition explored the area. Except for the lake itself, they found a water system between terraces and *yardangs* (soil formations cut and modelled by the wind, the results of grand-scale wind erosion). The vegetation was poor and scattered, the desert sterile and salty, and there were mostly salt marshes, but surprisingly sometimes also fresh water in small lakes. The explorers supposed that the area had been drying up since ancient times. From time to time, inundation from the river killed small shrubs and plants, even trees (Hörner and Chen 1935: 148, 150).

The changing location of the Tarim River and the increasing salination are most possibly the factors that transformed the formerly abundant Loplyk livelihood into an extreme adaptation to a desert area. For a century, intense discussion has been raging among scholars (now shifting to Chinese forums) about the reasons for the change in the river and desiccation in the area. A combination of factors seems to have caused the eastern branch of Tarim River and the Konche River to change their positions. They both terminated in Lop Nor which,

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

according to the theories of Hedin (1938), moved over great distances and, therefore, received the nickname "The wandering lake." The changes in the water system occurred quickly. When Przhevalskiy visited the Lop basin in 1877, he found a small lake with fresh and brackish water called Kara Koshun, which he identified as the ancient Lop Nor. It was a lake of considerable size. Yet when Hedin visited the same area nearly twelve years later, the lake was overgrown with reeds and most of the water had dried up. Hedin asserted, based on his explorations in 1900–1901, that Lop Nor wanders between its northern (Lop Nor) and southern (Kara Koshun) positions in the Lop desert. In ancient times, he argues, there was a Great Lop Nor which comprised both smaller lakes. In 1930–1931, Lop Nor was again in its northern position near Loulan (Hedin 1931b; Hörner and Chen 1935: 147). Hedin noted that the Kara Koshun was created about 1720, about the same time the Abdal village was built. Künchiqqan Beg told that his grandfather as a youth lived by the northern sea, but moved south, following the lake when the water disappeared. This shows, according to Hedin (1938: 290) that the lake had wandered several times over the centuries, which also accounts for the abandonment of ancient sites such as Loulan and Miran almost two thousand years ago.

Modern Chinese scholars contradict these theories, but a closer look reveals that there is not much difference in the concepts. The Chinese Lop Nor expedition in the 1980s found, using Chinese historical sources and fieldwork, that Lop Nor extended to Loulan at the northern edge until A.D. 330. After that, the Tarim River created Kara Koshun, which led to the abandonment of Loulan. In 1921, the Tarim River flowed again to the north and Kara Koshun dried up. Human intervention seems to have been the main cause at least for this latest change. Again in 1952, due to human activities, the end lake became Taitema in the south. Lop Nor, in the north, dried completely in 1964; some sources claim 1972 as the final date. The Great West Sea Reservoir (Daxihaizi) near Tikkanlik was built in 1972 and thus became the end lake, drying up all water systems below (Zhao and Xia 1984: 320). In modern satellite pictures, the dry basin of Lop Nor looks like an ear, because of salt crusts that have been formed during its process of dehydration. The causes for the changes of lake positions lie, therefore, in the river that changes its course, a fact that Hedin understood at least after his explorations in the 1930s. One important factor for the change of riverbeds in the Tarim Basin is sedimentation, which rapidly fills the bottom and forces the river to meander. Erik Norin (1932: 596) of the Hedin expedition found much stratified sand and silts in the central part of the Tarim Basin. In his observations, a considerable part of the present Lop desert was not covered with water, despite the fact that it now forms the deepest part of Tarim depression, but the rivers changed their courses many times over the centuries. Desiccation, according to Norin, is one of the main results of the change of riverbeds.

Some scholars stress the man-made impact on the changing hydrography in the Lop depression. Human-built water control installations influenced the lower reaches of the Tarim. Around 1930, a greater part of the water from the Tarim River was taken for irrigation already at the beginning and very rarely, sometimes only a trickle, reached the plains. Schomberg observed that the floodwater had been diminishing for fifty years due to increased irrigation and extension of agricultural land (Schomberg and Arnold 1930: 316).

Another cause, noted by several explorers, is climate change and the reduction of glaciers, ice, and snow in the mountains. All Tarim rivers feed on melting snow from the mountains and already a century ago observers noted that the glaciers were melting. This meant less water when there was less ice and snow in the mountains (Schomberg and Arnold 1930: 313–315).

Today, the detrimental processes in Xinjiang are identified as the combined results from climate change, dry phases, river realignment, and loss of water. Anthropogenic factors that influence the area are defined as follows: wars (especially the Muslim rebellions and strife between warlords before 1949), population increase, too intense or destroyed irrigation, desertification, and irrational use of water and land. Each of these separately, and even more when occurring together, lead to land degradation, dry rivers, vegetation loss, sand dune mobilisation, and soil salination. Local people in Xinjiang, having little else to take, use biological energy sources for fuel, mostly wood which destroy still existing forests. In arid areas this is highly destructive and advances further desertification and wind erosion (Zu et al. 2003: 641–643).

Fishing and Fisheries

In a photograph taken by Hedin, a Loplyk fisherman holds a huge fish in his arms. This strange fish, says Hedin (1944: 181 f.), lives in shallow water. It is "poor eating white meat"; not satisfying for the refined palate of the explorer, but it formed

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

the subsistence of the Loplyks. This fish, called *Xinjiang datou* (Chinese: "big-head"), is highly endangered today, even believed to be near extinction, and can be found solely in the Tarim basin. It is the sole species of the genus *Aspiorhynchus* first described by Day (1877), a large cyprinid, reaching 120–200 centimetres in length and weighing up to 26 kilograms. Being of silvery complexion, the *Xinjiang datou* has a large, broad head, a wide mouth, a protruding lower jaw, and small scales integrated in the skin. Until the 1970s, it was abundant in Xinjiang, but the construction of water diversions, irrigation channels and dams have blocked their spawning migrations. Overfishing is the main cause for its disappearance, and the introduction of other species for fishery development also threatens the habitat and numbers of the fish (Bain and Zhang 2001: 380).

Normally, Uighurs of southern Xinjiang disliked fish as food (Le Coq 1928: 37f.). Despite this, fishing as an important means of livelihood existed not only among the Loplyks but also among the Dolans in the Maralbashi and Merkit area (Svanberg 1996). While the Dolans got their provision also from raising livestock, the Loplyk ecological adaptation was more specialised as fishermen, foragers, and hunters. Even after the 1920s, when ecological conditions forced them to move away and become agriculturalists and herdsmen, and well into the 1950s, fishing remained an important occupation, yet only on a limited basis.

It seems that Przhevalskiy was the only visitor who could observe an independent forager culture in the Lop area. In the 1870s, the Loplyks were still living as fishermen, hunters, and gatherers. They fished, he tells, they trapped water fowl and gathered reeds for huts, fuel, and beds and collected the wild Lop hemp (*Apocynum venetum*), which provided fibres for clothing and fishing nets (Przhevalskiy 1879: 107–111). In short, all they needed was found in their immediate vicinity.

This way of life was certainly an adaptive response to the environmental conditions. Loplyks lived in a constant dialogue with the desert, waters, weather, climate, and other environmental factors that could change at any given time, demanding immediate and adequate reaction from the people. Inadequate or too slow reaction would mean hunger and death. Local informants told visitors about earlier periods with more water, richer fishing, and evidence of fishing trade, several decades prior to Przhevalskiy's first visit. Huntington (1907b: 144f.) was told that Loplyks brought fish to Lachin and loaded them on donkeys for further transport to Dunhuang. This happened two or three hundred years earlier (counted from around 1900). When the lake started drying up, however, the fish died. As the water supply disappeared or moved away during the centuries, Loplyks gradually had to develop a self-supporting fishing, hunting, and gathering culture based on arid conditions.

Like other inhabitants in desert areas, the Loplyks were quick to react to environmental change. They had probably moved their villages many times in the region, following rivers and lakes. Toktha Akhun told Huntington (1907b) that the ancestors of the Loplyks either died of hunger or moved away, looking for new water supplies. Resettlement according to changes in water level, recapturing older settlements or building new ones depending on the conditions seems to be among the main characteristics of Loplyk life at least in the nineteenth century. This special adaptation pattern caused several travellers to define them as seminomads. Yet even more extreme arid conditions, just before the twentieth century, led them to abandon Lop Nor and resettle in villages and towns nearby.

During his second visit, the situation was very different from ten years earlier and Przhevalskiy could observe changes taking place due to increasing Chinese influence and immigration. He writes that he spent two months in the Lop area "observing the flight of birds and studying the natives." These last-named received the explorer, naturally, "very heartily and were a hundred times more frank than on the occasion of our first visit to the lake in 1876, when we appeared here in the company of the companions of Yakub-beg of Kashgar." They were still living in reedy enclosures engaged in fishing and snaring wild duck, but now some tended cattle and a few did a little agriculture, and they were "under the government of Kunchikan Beg." Formerly one of the richest men among Loplyks, Künchiqqan Beg, however, had become very poor, paying off his silver in bribes to the local administration (Przhevalskiy 1885: 807; 1948: 1888).

This was the beginning. Later travellers observed mostly the processes of change and several elements of the previous lifestyle. One abandoned Loplyk settlement was found by Hedin (1903b: 241) near Altimish-bulak. A small village of nine or ten houses yielded a piece of timber with a fish depiction. He found four further villages and three towers in the area, and in a couple of houses there were "large quantities of fishbones, of the same species which now live in the Kara Koshun Lake." Wheat, rice, and parts of skeletons of sheep completed the findings. Stein found the fishing hamlet of Abdal abandoned since 1906, consisting around 1916 of "mud hovels and reed huts," but Tokhta

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

Akhun kept one hut habitable for fishing parties and visitors. The expedition could easily follow Loplyk fishermen's tracks back to the Tarim River (Stein 1920: 9). The Loplyks, it seems, held on to traditions in their choice of fishing grounds, despite the constant need to find new places with fresh supplies for subsistence. Known grounds were certainly more secure than opening up new areas. Hedin brought Lop men with him on a journey on the Yangi-darya, "New River," where they had never been before and they were very surprised (1954: 245).

We can presume that different fish species were still relatively abundant in the Tarim River and Lop Nor a century ago. Fish was the traditional staple food for the Loplyks. They ate fresh fish during most of the year, but stored stockfish for wintertime and days when because of storms it was impossible to do any outdoor work. Hedin (1902: 51) recorded that a small hamlet on the Tarim River bank with fourteen inhabitants consumed 15–20 medium-size fish a day. Fresh fish were eaten boiled and the Loplyks also drank the fish broth, *balïq šorba*. Dry fish were first steeped in salt water and then fried (Przhevalskiy 1879: 109). There was also smoked fish in Charkhlik (Bonvalot 1891: 73). Huntington (1907a: 69) is probably the most explicit: in Abdal, the "kind people" had caught fish for the visitors and he asked them to cook it in Loplyk fashion. After a while, the lady of the house appeared "with a steaming bowl of fishy, unsalted water." Upon his question, she explained that Loplyks always drink the water in which the fish is boiled. The disgusted explorer omitted the first course, but ate the boiled fish and found it delicious. One of his Turki men asked Huntington if it was true that Loplyks were so adept in eating fish that they could put the fish meat in one side of the mouth and at the same time spit out the bones from the other side.

According to Pevtsov, Loplyks distinguished five species of fish in the Tarim River and Lop Nor: Tarim marinka or *ottur balïq* "middle fish," *Schizothorax biddulphi* (Günther, 1876); *datou* fish or *minlaj balïq*, *Aspiorhynchus laticeps* (Day, 1877), mentioned above; Kashgarian loach or *tazek* "dung fish," *Triplophysa yarkandensis yarkandensis* (Day, 1877); Balkash marinka or *egei balïq* "saddle fish," *Schizothorax argentatus* (Kessler, 1874); and scaly osman or *it balïq* "dog fish," *Diptychus maculatus* (Steindachner, 1866), the last mostly found in lakes.[1]

1 Przhevalskiy (1948: 185); Pevtsov (1949: 232); Malov (1956: 105, 115, 144, 152, 166); Jarring (1997: 64); and Liu and Hu (2009).

The spawning season of the fish was in May when they swam down the rivers to the lakes. During this month the Loplyks had their most energetic and active fishing season. They set out nets and seines (large, vertical fishing nets) in the lakes and from their canoes, skilfully manoeuvred by men as well as women, standing in the rear or several persons in a row, they drove the fish into the nets with their oars. The greater part of the fish captured during the spring fishing was cured in the sun for winter storage. After cleaning and removing the entrails, the fish were cured unsalted. The stockfish were stored indoors in the reed huts. During summer, fishing was also conducted with hooks, and in the autumn they used harpoons in addition to nets and seines. Limited ice fishing with nets was employed during the wintertime. Fish were not sold anymore in the nineteenth century but consumed solely by the Loplyks. Nevertheless, some fish oil extracted from the intestines was sometimes purchased by itinerant traders (Pevtsov 1949: 232f.; Przhevalskiy 1879: 109f.).

Hedin (1954: 259–261) notes another important fishing season, the autumn, when the ice began to cover the rivers and the lakes. Drift ice, called *kömul* or *kade*, pushed the fish into clear brooks and lagoons of the rivers and all Loplyk men got out fishing for the winter stores (cf. Malov 1956: 123; Jarring 1997: 261–263). Some boats became so full of fish that they weighed down close to the water level. The Loplyks pulled the canoes up on the beach for the night, so that they would not be crushed by the ice, but Hedin had to cut his heavy ferry free every morning. The Loplyk canoes were long, thin, and low, cut out of one poplar trunk, light and small "like a nutshell." Usually they rowed standing in their canoes, navigating through narrow passages of the river between reeds, islets, poplar trunks, roots, and all kinds of rubbish. They could also heat their boats with a fire plate placed on wood at the bottom, and were adept in negotiating rapids. A Loplyk father and his two sons were fishing with nets when Hedin came upon them as he was floating down the Tarim River. They had covered an inlet of the river with their net. Standing in the rear, they pushed the boat with their broad oars at high speed over the net and up on the ice which broke under their weight. With the oars they chased the fish into the net which was then pulled up. If the ice was too strong, the Loplyks would beat the hard cover with the oars, thus scaring the fish into the net. In the winter, both Hedin and Stein note, the Loplyks fished also in the smaller lakes. Fish was taken in nets through holes in the ice of the ponds, being driven into them by the men

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

stamping and jumping on the frozen surface of the lakes (Hedin 1954: 221, 235–243; Stein 1920: 9).

An interesting phenomenon in the Lop area is the lakes formed by the Tarim River inundations. Huntington (1907a: 68) observed that Loplyks "live in reed houses on marshy shores of Lop Nor, really a swamp," eating fish and paddling their canoes "through narrow lanes of reeds from pond to pond." The Tarim River brought with it great amounts of melt water from the mountains in some years and this extensive water amount flooded the basin and formed lakes, bringing with it also fish which remained in the lakes when the water pulled back. In dry years, the lakes diminished and became saline. Hedin did some measurements in the marshes north of the new Kara Koshun. The lakes were an average of ten metres deep, the river deeper. The marginal lakes were situated between dunes of drifting sand, feeding off the river and filtering away into small lagoons along the principal channel. The channels were filled with sediment. He writes (1903b: 231): "Many of these lakes are carefully preserved by the natives for the sake of the fish which they contain. First they stop up the channel which supplies the lake with water from the river. This causes the lake to become stagnant, and it begins to shrink by evaporation, whereupon the water becomes slightly salt, which is believed to make the fish bigger and more palatable. The natives catch them in a drag-net pulled along by two canoes." The fish, coming into the lakes with the spring floods, were an easy prey for the Loplyks. When the water became brackish, the fish rose to the surface and were caught (Stein 1920: 9–11).

A whole chain of such lakes, a total of 35 salt pools were observed by Hedin in one area. They would take in more water from the river unless dammed and were used by the Loplyks only for fishing, even if they also took a little water for their small-scale agriculture. Most of the fish would come from these small lakes. The ponds were cut off from the river by the means of earthen dams and there was no outflow, only an inflow from the river. Every three to five years, fresh water was let into the brackish, saline waters which were bitter and disagreeable in taste. Having existed for many years, the ponds would ultimately perish through the sand dunes or the unstable river, but then the Loplyks would shift their seminatural fisheries to other lakes. There were dozens of such lakes near any Loplyk village and many had filled only recently. The shores were overgrown with tall reeds. As to the origins, the Loplyks said that the lakes were artificially created long ago by their ancestors. Each lake had its owner who held monopoly on the fishing rights. Hedin supposed, in opposition to local informants that the lakes were in reality natural and had existed long before the river carved this path for itself and started flooding the area. No human being, he argues, could have dug out so many lakes or in such shapes (Hedin 1905).

In 1892, some lakes were already abandoned by families who had turned to agriculture. By 1906 the lakes had dried up, according to Tokhta Akhun (Stein 1920: 9). The Loplyks had to turn to other subsistence activities. Since Central Asia belongs to the most arid geographical zones of the earth, specialised fishing cultures naturally have to be rather rare economic adaptations for humans living there. With the drying up of the waters the Loplyks abandoned their unique lifestyle and turned into agriculturalists and herdsmen.

Hunting and Animal Husbandry

The Loplyks were Muslims and the customs connected with the life cycle rituals followed the cultural pattern of other Islamic peoples. The boys were circumcised when they had reached an age of four or five. The rituals were generally conducted in spring, when fish and ducks were plentiful enough for a celebration with neighbours and kin (Przhevalskiy 1879: 111). In other aspects Loplyks were not so strict. Huntington (1907a: 69) tells how women and girls moved freely in the homes and villages. There were no mosques, no daily prayers, and no visible rules. The Muslim (non-Loplyk) head man of the expedition expressed his opinion thus: "The Loplyks are good people, but they don't have much work with God." However, they did hold some dietary regulations. Wild boar (*Sus scrofa*) was common in the vicinity, but the Loplyks as Muslims did not hunt or touch pork meat. This is certainly the reason why the boars did not fear the Loplyks, as noticed by Przhevalskiy (1879: 107).

Hunting played a much smaller role than fishing but was conducted on a regular basis. The abundance of migratory seabirds halting at Lop Nor on their way to Siberia was important for Loplyks. During springtime they could add wild fowl meat and eggs to their diet. They mainly snared the birds, particularly ducks. Przhevalskiy noted enormous numbers of waterfowl and waders during the spring migration, especially pintailed ducks (*Anas acuta*), greylag geese (*Anser anser*) and barheaded geese (*Anser indicus*), as well as swans (*Cygnus cygnus*), ground jay (*Podoces biddulphi*), saxaul sparrow (*Passer ammodendri*), woodpecker,

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

shrikes, sand swallows, hoopoes, and an occasional pheasant. Most of the duck meat was consumed fresh, but some was smoked and stored. Duck feathers were mainly sold to visiting merchants, but some duck skin was used as lining in Loplyk winter cloths (Pevtsov 1949: 233; Przhevalskiy 1948: 207–210; 1885: 808–810). For bigger game, the Loplyk men migrated seasonally to the Tibetan highlands to hunt wild ass or *qulan* (*Equus hemionus*) and Tibetan antelopes (*Pantholops hodgsonii*) for their hides. Wild camels (*Camelus ferus*) roamed the Lop desert and they were hunted occasionally by Loplyks. Among the best hunters was Tokhta Akhun, whose knowledge of wild camel chase was stunning even to Stein (1920: 8). However, local hunters told the explorers that all wild camels, these "ghosts of the desert," had left around 1900 along the Tarim River (Leche 1904: 60; Hedin 1905: 78). Przhevalskiy (1885: 810) notes also antelope (probably black-tailed gazelle, *Gazella subgutturosa yarkandensis*) and Yarkand deer (*Cervus elaphus yarkandensis*) among the bigger animals in the area.

Fur trade did not extend into the Lop area, but Loplyks did some hunting with the aim of getting furs for their own use. Local *begs* also collected tax in furs from their subordinates. It is reported that the Loplyks paid yearly a certain number of otter skin to the ruler of Turpan (Bruce 1907: 161f.). During the winter season, some Loplyks trapped wolves (*Canis lupus*) and red foxes (*Vulpes vulpes*) for their furs. Otters (*Lutra lutra*), too, were captured for their skins except for taxes (Pevtsov 1949: 233f.). Small rodents and hare abounded in the area (Przhevalskiy 1885: 810). Tigers (*Panthera tigris virgata*) now and then appeared in the reed belts of Lop Nor. Since there was a demand among Chinese for medicine made of tiger meat and itinerant traders were willing to pay a high price for it, the Loplyks used to hunt or poison the animals when they had the opportunity and sell to the traders (Le Coq 1928: 47). This seems to have been of a short duration, because Hedin (1954: 236f.) notes that there were tigers in the southern part of the Lop depression, but only Turki hunters caught them.

The Lop Nor Scientific Expedition (see Xia 1987) collected 127 species in the Lop area at the beginning of the 1980s. 23 were mammals, 91 birds, 7 reptiles, and one was amphibian. Many wild animals, among them tiger, wolf, and wild boar had disappeared, but there was still the wild camel. The Lop region is probably the last place in world where wild camels roam (Zhao and Xia 1984: 316; Hare 1997, 2008).

When the water dried up in the Tarim River and Lop Nor and it began to be difficult to survive on fishing, animal husbandry increased in importance. Przhevalskiy (1885: 808) noted during his second visit that the Khotanese colony in Charkhlik influenced the Loplyks so much that they "began to engage in husbandry and emerge of savagery." Some Loplyks had donkeys or horses as beasts of burden, even camels, but sheep were the most important livestock. This is the case also with their neighbours – sheep even today are the most important animals for Uighurs in Xinjiang. Around 1916, Stein (1916: 119; 1920: 6) found a Loplyk colony of a dozen families from Abdal resettled since 1908 in the small oasis of Miran. Slowly turning from fishermen and hunters into casual agriculturalists and herdsmen, they could easily provide him with workers and camels.

Animal husbandry can be seen as the only available alternative strategy for the Loplyks at this period. Yet even after the Loplyks took up animal husbandry, meat continued to be rarely used as food. Traditionally, meat-eating only occurred in connection with very special occasions, such as the wedding of the son of a *beg*. As long as fish still existed, all kinds of fish continued to be the most common food item among the Loplyks. The officials in the region also contributed actively to the changes. After the smallpox epidemic around 1890, local Qing authorities gave surviving Loplyks plots on the left bank of the river and forced them to settle down, grow wheat, and keep animals. Certainly, Loplyks tried agriculture in Charkhlik, but they could not compete with the neighbouring Turki settlers. The soil was not suitable for cultivation, the harvests far from enough, and the Loplyks had often to barter their sheep to get flour from Korla in order to survive. The richest had a thousand sheep, but most were poor with only up to a hundred sheep. The Lop area provided some grazing land for their herds but not for long. When the river changed its course in 1921, the vegetation also changed. Occasional Loplyks would return to the lake to fish in the summer. The authorities had vaccinated the population, but they remained sceptical toward the administration and were still afraid of infections. Returning to the villages on fishing tours, the men would not sleep in their previous homes but stayed under the sky. Travellers who visited the Loplyks after this period found mostly herdsmen who did not eat fish except for supplying extra food. At the same time, cereals had grown in importance in the Loplyk diet, and they were slowly turning into peasants (Hedin 1905: 80f.).

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

Wild Plant Use and Agriculture

In 1891, American explorer W. W. Rockhill (1894: 143 f.) heard stories from local Mongols about wild men, *geresun kun*, who lived in the Lop desert. These wild people allegedly made their beds of reeds and fed on wild grapes. Grape consumption has not been recorded among Loplyks, but reed beds were common. The Loplyks made not only their beds of reeds but also their huts, and their clothes were made of weed. Yet with the establishment of Charkhlik, agriculture and a new type of sedentary life was introduced into the region. Irrigation made it possible to grow wheat and barley in the oasis and there were also peach and apricot trees. French traveller Henry of Orléans noticed even vines growing in the town (Bonvalot 1891: 74).

Plants played an important role in the subsistence patterns of the Loplyks. In contrast to most other ethnic groups in Eurasia, they relied only on a handful of species, in fact only three: *Phragmites*, *Apocynum*, and *Populus*. These three, however, provided the Loplyks with almost everything they needed for survival. Only one of the plants in the Lop country was gathered for food. "Till 80 years ago," writes Huntington (1907a: 68 f.), "no Loplyk had resorted to agriculture, but all lived on fish or wild-fowl, in spring soft tips of reeds and rushes, but never bread." The Loplyks indeed, like Inuit in certain areas, defied international nutritional norms by subsisting on a diet which seems to have been extremely poor in carbohydrates. Typical hunter-gatherer peoples feed, according to research, on a diet composed mainly of meat, including wild game and fish, while very few receive their calories from plants. The Loplyks suit well into this category. The usage of fruit, seeds, nuts, underground storage structures such as tubers, roots and bulbs, flowers, and leaves was, however, close to none among Loplyks (see Cordain et al. 2000; Kious 2002: 2).

There are very few records of wild plant use for food among Loplyks. As seen above, only the fresh shoot of reed was gathered and eaten and the Loplyks extracted sugar from the roots. The reason for this very limited use of wild plants is not clear, but could be found in the scarcity of usable plant species. The Lop Nor scientific expedition collected in the 1980s in all 36 species of plants of 13 families, mainly Chenopodiaceae and Compositae, and 26 genera. All of these are drought resistant, salt tolerant shrubs, and perennial grasses (Zhao and Xia 1984: 316). They are little suited for nutrition. The Euphrates poplar *Populus euphratica* Oliv., tamarisks *Tamarix ramosissima* Ledeb., *Tamarix hispida* Willd., and *Tamarix chinensis* Lour., *Halimodendron halodendron* (L.) Voss, *Lycium ruthenicum* Murray, *Phragmites australis* (Cav.) Trin. ex Steud., *Alhagi sparsifolia* Shap., *Apocynum venetum* L., *Karelinia caspica* (Pall.) Less., and *Glycyrrhiza inflata* L. are still found in the lower reaches of the Tarim riverbank area.[2] Przhevalskiy (1885: 809) found also *Myricaria*, *Astragalus*, and wild asparagus, all covered by dust in the desert.

Also the theory that Loplyks migrated from another area might, if proved, explain some reasons for the little nutritional use of local plants, because of limited knowledge or other reasons. On the other hand, the extensive use of the three plants mentioned shows that the Loplyks had adapted completely to the local conditions. There is, in fact, no actual reason to expect a wider use of wild plants among Loplyks; fishing was the main occupation and it seems to have satisfied most of their nutritional needs. Plants were used for their other needs such as houses, clothing, and fishing implements. They were, however, certainly not indifferent to the non-economic plants in their landscape, something which is reflected in the many toponyms with indigenous plant names recorded by Hedin. On the contrary, many plants and bushes were obviously named by Loplyks and were part of their cognitive realm (Jarring 1997).

Loplyks were very adept in using the scarce materials available. Reed (*Phragmites australis*), *qamiš* in the local language, was abundant and provided building material and fuel for the Loplyks (cf. Kiviat and Hamilton 2001 for comparative perspectives). The most prevalent type of dwellings was the reed hut, *satma* or *qamiš üy* "reed hut." It was constructed by a rough framework of poplar logs tied together. The logs in the corner were called *tukuk*. The roof beams were called *baraj*, while smaller laths, which lean on the beam, were called *čäsi-jagač*. Against the log framework bundles of reed were placed standing on end and fastened to the logs.[3] The flat roof was also made of reed. Even the ground inside the hut was covered with reeds. In the middle of the floor there was a fireplace (Przhevalskiy 1879: 108; Malov 1956: 91). The reed houses consisted of several rooms, some used mainly for storing stockfish and smoked ducks. There were few implements and household utensils. Most tools were made of poplar; a few iron items were man-

2 Chen et al. (2006: 234 f.); Chen et al. (2008: 1374); Hedin (1903b: 229).

3 Hedin (1902: 51 f.); pictures can be seen in Hedin (1954: 215, 219) and a Loplyk fishing village in Hedin (1954: 223).

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

ufactured at Charkhlik or Korla and bought by the Loplyks. Also, Henry of Orléans noticed swallow nests inside the huts and was told that birds were held in great respect (Bonvalot 1891: 80; Hedin 1902: 52).

Reeds were connected with several rites in Loplyk life. The marriage age was, according to Przhevalskiy (1879: 111), around fifteen years. A sort of night courtship occurred among the youth. The Loplyks lived in a rather egalitarian society and parents did not choose partners for their children. The youth of both sexes raced each other among the reeds. During this kind of play they chose someone with whom they spent the night. The social control by parents and other youths was hard, so Przhevalskiy did not suppose any premarital sexual relationship. This kind of courtship gave the youths, though, the opportunity to become more acquainted with each other. (Night courtship occurred also in many geographically marginal areas of all Eurasia.) The bride-price among the Loplyks consisted of ten bundles of wild hemp fibre, ten strings of dried fish, ten cups of fish oil, a stewpan, twenty or thirty loaves of bread, from fifty to one hundred ducks, a flint and steel, and a dugout canoe (Bonvalot 1891: 100). Later, when shepherding became more common, the bride-price was changed to animals and money. It is interesting to note that the price was not an investment that could be saved. Most items included were for relatively immediate consumption. It gave the newly married couple a start but provided nothing for the future.

Another custom related to reeds are Loplyk funerals. When a man dies, says Henry of Orléans, his hands and feet are tied and then he is dressed in a garment. Prayers are recited and the corpse is placed on a stretcher made of reeds and osiers. The corpse is then covered with more reeds and finally a pole with a piece of paper is fixed to the ground (Bonvalot 1891: 101–103; Hedin 1902: 71). At the cemetery of Abdal hamlet, Pevtsov (1949: 139) noticed that skulls of horses or tails of yaks were placed on the poles, a custom that was common among Uighurs and several other peoples in Eurasia. In some places in the Lop country, graves were covered with sand rather than reeds. According to Przhevalskiy, in another instant dugout canoes were used as coffins and the deceased was buried together with half of his fishing nets (Przhevalskiy 1879: 113).

Also of great importance for the Loplyk economy was the wild, so-called Lop hemp (*Apocynum venetum*), known by them as *čige*, abundant in the region. This hardy plant provided fibres for textiles and ropes (Pevtsov 1949: 233, Przhevalskiy 1879: 108f.). For instance, garments were made of the wild hemp. For the manufacture of hemp bark, the plant was uprooted with a hoe made of a triangular piece of iron and with a piece of reed as the handle. The stems were cut with a kind of hatchet, made of a fragment of iron affixed to the end of a piece of bent wood (Bonvalot 1891: 91; cf. Forsyth 1875: 52). The fibres were described as very high in quality by several travellers. The Loplyks made their cloaks and trousers of the fibre (Przhevalskiy 1879: 101; cf. also Katanov and Menges 1933: 1226). The weaving of garments was always done by women and they also knitted their nets from hemp fibre. Knitting of nets seems to have been done by both women and men. According to Bonvalot (1891: 68), cushions were manufactured from the silky substance surrounding the *Apocynum* grain, and it also made a very soft bed for small children. Huntington (1907a: 69) explains that the nets made of the "Lop plant fibre" is much tougher than hemp, in a similar degree as hemp is tougher than cotton. Hedin describes in his diaries from 1896 how the fibres were worked into fine soft threads which were twisted into strings. They were also sometimes twisted two together into strings which were tied to nets with diagonal meshes (Jarring 1997: 107f.). Nowadays *Apocynum venetum* tea for health and longevity is sold on the Chinese and international markets.

The third important plant in the Lop area was the poplar (*Populus euphratica*), *tograq* in the Loplyk tongue. It grew along the river banks and the Loplyks floated the lumber down the rivers to their settlements. Lumber was needed for dugout canoes and for manufacturing household utensils. Poplar was also used for the structure of the houses as explained above. Apart from the native poplars, also the below-ground stocks of tamarisks, especially *Tamarix ramosissima*, are still used in large amounts for firewood in Xinjiang. Both species are used for construction purposes throughout the region and herbaceous perennial plants are grazed by sheep, goat, and camels or harvested for winter forage even today (Bruelheide et al. 2003: 806). Gathering forage was an important source for cash for the Loplyks at the turn of the century. Hedin (1954: 288) received in 1900 from local Loplyks a thousand bunches of clover and as much straw for his animals. The gathering was organised by the local *beg* and Hedin paid the Loplyks according to local prices. However, the Loplyks did not gather fodder for themselves as long as they were subsisting mainly on fishing.

Households that had access to land in Charkhlik were able to consume some cereals. According to

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

Henry of Orléans, villagers of Abdal owned some land in Charkhlik which they rented to others. They developed a kind of sharecropping system where the tillers were paid in kind, with a portion of the crop and a few sheep (Bonvalot 1891: 89). Charkhlik was not the only settlement in the region which was founded at the end of the nineteenth century. Huntington (1907c: 266f.) describes how a Chinese official in 1889 opened new lands for settlements at Jan-köl on the Tarim River. People from Turpan, Korla, and Kucha arrived to obtain plots. Not less than 2,000 settlers inhabited the place within a few years. However, the soil was soon spoiled by salination and the place was abandoned as early as 1892. The same happened in Dural, first populated by Turkis who left due to increasing salination, being replaced by Hui (Chinese Muslims) who were forced to settle there by the Qing authorities in 1898. The land was most unproductive and the Hui also migrated further. The former entirely Loplyk settlement, Tikkenlik, was also populated by new settlers from Turpan taking up land for agriculture. Again, increasing salination made it impossible to cultivate the land and soon people left or changed their livelihood. When Huntington visited the village at the beginning of the twentieth century, the 500 or so villagers had either turned to raising sheep or fishing. While most of the population in the new settlements were outsiders, the settlement of Miran seems to have been mainly a Loplyk undertaking. Formerly, Loplyks migrated seasonally to Miran for a few months in summer to cultivate wheat and barley. Around 1910, Loplyks had established more permanent settlements and did not migrate anymore. By 1911 some thirty families were established in Miran (Stein 1928: 170f.).

The vegetation in the Lop depression is very sensitive to environmental change. Once destroyed, the forests or riverbank growth can be reestablished only with difficulty. Natural regeneration of most species, with the exception of *Tamarix ramosissima*, does not happen easily. Especially poplars are difficult to regenerate (Bruelheide et al. 2003: 816). Today, the lower reaches of the Tarim River have been dry for so long that the groundwater level is very low. This leads to the degradation of vegetation over large areas, a serious reduction of biodiversity and disruption of the ecosystems. Regeneration efforts such as artificial recharge of water have had some but very limited results (Chen et al. 2006: 243; cf. Ruan et al. 2009). Now Loplyks, if they would return to the traditional use of reeds, hemp, and poplar, would not have enough materials.

Conclusion

The rivers still supplied some fish and Loplyks could migrate within a limited area for some fishing as late as the 1950s. Lakes seem to have disappeared and reappeared several times in the twentieth century. The Soviet ethnographer E. M. Murzaev (1966: 187) visited what he thought was Lop Nor in 1957 and Loplyks told him that the Tarim had flooded and created a lake which they called Chong Köl (The Large Lake). In 1959 another Soviet scholar still found a salt lake out in the basin. These lakes were highly saline and could not produce anything for the Loplyks or any other people. Only the remaining rivers provided them with fish and probably produced some grazing land on the banks as well (Zhou and Zhi 1962). The ancient oases in Taklamakan were preserved well into the 1940s, but after the People's Republic of China came into being in 1949 there were several changes in Xinjiang. The new People's Republic constructed in Xinjiang artificial oases for agriculture, redistributed water resources, built canal systems, created a forest network, and opened up land for crops. In the new oases, the productivity rate is higher, but at the same time more sensitive to human actions than in natural oases, which are less affected by human activities. Chinese attempts to develop southern Xinjiang finally destroyed the possibilities for the Loplyks to survive as fishermen. During the 1960s, the huge water reservoir Daxihaizi at Argan was built. Since 1972 it completely stopped all further Tarim River flow and has dried up several hundreds of kilometres of the reaches in the Tarim Basin, including Lop Nor which no longer exists as a lake.

Even though some efforts have been made since the year 2000 to send water into the old river beds and some vegetation has reappeared, the area is now irreversibly a desert. The complicated balance between groundwater level and vegetation has not been restored and the ecosystems are unstable. In 1964, China detonated its first nuclear bomb in the Lop depression. Nuclear tests, totally 45 both underground and above the ground, continued until 1996 and the area is no longer inhabitable. Local people have asked for compensation for the nuclear downfall they have been exposed to, but until now Chinese authorities have reacted slowly. Still, the Lop area hosts a whole city of nuclear scientists and now also industrial centres. The Lop bed contains potassium chloride, oil, gas, carbon, iron, copper, and gold, and is now exploited for industrial purposes, mainly for the production of fertilizers (Zu et al. 2003: 640; Chen et al. 2008: 1371–1377).

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

Only in 1999, a protected area for the preservation of the Lop region was created in the desert (Xia and Hu 1985: 82; Hare 2008).

Today, the descendants of the Loplyk fishermen live in villages and small towns in the Tarim Basin. Their language and culture are assimilated with the Uighurs, and they were long thought lost. Loplyk language is now considered an Uighur dialect. French researcher Sabine Trébinjac identified Loplyk descendants only with the help of old music recordings, playing them in 2001 to several groups called Uighurs in the Tarim Basin. Some could recognise the songs, sung by elder relatives, and thus she could identify the Loplyk descendants, even though there were few outward signs of their origins (Trébinjac 2008). As marsh- and lake dwellers, the Loplyks were a unique culture in the arid areas of Eurasia. There are some parallels – the Barabins in Siberia, who also subsisted on fishing, and in Hungary, the Pákász who caught fish with primitive implements, by hand, fish traps, and poison. The Pákász also hunted game and waterfowl, collected eggs and coloured feathers, but in contrast to the Loplyks they made much use of edible plants in the marshes and the women gathered medical plants which they traded. The Pákász also gathered honey, leeches, and tortoises. Similar to the Loplyks, they spent the summers in reed huts in the marshes, but unlike the Loplyks, they did not pay any taxes. Similarly to Loplyks, Pákász were forced to become herdsmen or agriculturalists around 1900 when the marshes were drained (see Gunda 1949: 369f.). In Hungary the marshes were consciously destroyed, whereas in the Lop area the marshes, lakes, and ponds dried up due to anthropogenic pressure and climate change.

As foragers, Loplyks differed in their diet, which was mostly based on fish and with little or no plant substance, from other foragers. Yet they were by no means unique in subsisting on one resource; several examples can be found among Eurasian nomad herders. The Loplyk fish diet was supplemented by reeds, wild game, wild birds, and eggs. In their use of plants for other purposes, they mainly relied on three taxa: reed, poplar, and Lop hemp. The scarcity of biological resources in the area accounts for their simple way of life. Their early adaptation consisted in using fully the locally available sources such as reeds, poplars, and Lop hemp for houses, boats, and clothes. Fish was their staple food and they invented boats that were functional in the river and lake environments they lived in, skilfully navigating over ponds and even rapids. Yet in the period we have been able to study (late nineteenth to early twentieth century), the Loplyks were already leaving their fishing-hunter-gatherer way of life. Since the 1880s, the Loplyks were gradually forced to settle down by authorities and environmental change, which caused the waters to dry up in their landscape. By the 1950s, most Loplyks had opted for sheep and agriculture like their neighbours, fishing only occasionally but still trying to hold on to their fish diet, even if grain and meat now mostly substituted for fish. Human-originated environmental damage and deterioration has at the end of the century dried up Lop Nor and the entire river system in the lower parts of the Tarim. Still, the Loplyk methods and ways of adapting and using the scarce biological resources in the desert hold valuable information for modern research.

References Cited

Bain, Mark B., and **Shuimin Zhang**
2001 Threatened Fishes of the World. *Aspiorhynchus laticeps* (Day, 1877) (Cyprinidae). *Environmental Biology of Fishes* 61: 380.

Barnard, Alan
1983 Contemporary Hunter-Gatherers. Current Theoretical Issues in Ecology and Social organization. *Annual Review of Anthropology* 12: 193–214.

Bergman, Folke
1935 Newly Discovered Graves in the Lop-nor Desert. *Geografiska Annaler* 17 (Supplement): 44–61.

Bonvalot, Gabriel
1891 Across Thibet. Vol. 1. London: Cassell.

Bruce, Clarence D.
1907 In the Footsteps of Marco Polo. Being the Account of a Journey Overland from Simla to Pekin. Edinburgh: William Blackwood.

Bruelheide, Helge, Ute Jandt, Dirk Gries, Frank M. Thomas, Andrea Foetzki, Andreas Buerkert, Wang Gang, Zhang Ximing, and **Michael Runge**
2003 Vegetation Changes in a River Aasis on the Southern Rim of the Taklamakan Desert in China between 1956 and 2000. *Phytocoenologia* 33: 801–818.

Chen, Ya-Ning, H. Zilliacus, W.-H. Li, H.-F. Zhang, and **Y.-P. Chen**
2006 Ground-Water Level Affects Plant Species Diversity along the Lower Reaches of the Tarim River, Western China. *Journal of Arid Environments* 66: 231–266.

Chen, Yaning, Zhonghe Pang, Yapeng Chen, Weihong Li, Changchun Xu, Xinming Hao, Xiang Huang, Tianming Huang, and **Zhaoxia Ye**
2008 Response of Riparian Vegetation to Water-Table Changes in the Lower Reaches of Tarim River, Xinjiang Uygur, China. *Hydrogeology Journal* 16: 1371–1379.

Cordain, Loren, Janette Brand Miller, S. Boyd Eaton, Neil Mann, Susanne H. A. Holt, and **John D. Speth**
2000 Plant-Animal Subsistence Ratios and Macronutrient Energy Estimations in Worldwide Hunter-Gatherer Diets. *American Journal of Clinical Nutrition* 71: 682–692.

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

Day, F.
1877 On the Fishes of Yarkand. *Proceedings of the Zoological Society of London* 53: 781–807.

Forsyth, Thomas D.
1875 Report of a Mission to Yarkund in 1873, under Command of Sir T. D. Forsyth. With Historical and Geographical Information Regarding the Possessions of the Ameer of Yarkund. Calcutta: Printed at the Foreign Dept. Press.

Gunda, Béla
1949 Plant Gathering in the Economic Life of Eurasia. *Southwestern Journal of Anthropology* 5: 369–378.

Hare, John
1997 The Wild Bactrian Camel *Camelus bactrianus ferus* in China. The Need for Urgent Action. *Oryx* 31: 45–48.
2008 Camelus ferus. In: IUCN 2009. IUCN Red List of Threatened Species. Versions 2009.2. <www.iucnredlist.org> [02. 03. 2010]

Hedin, Sven A.
1898 Through Asia. Vol. 2. London: Macmillan.
1902 Forskningar i Lop-Nor-området. Stockholm: A. Bonnier. (Tilläggsband till en färd genom Asien 1893–97)
1903a Central Asia and Tibet. Toward the Holy City of Lassa. Vol. 1. London: Hurst & Blackett.
1903b Three Years' Exploration in Central Asia, 1899–1902. *The Geographical Journal* 21/3: 221–257.
1905 The Lakes beside the Lower Tarim. *Bulletin of the American Geographical Society* 37/2: 78–83.
1931a Across the Gobi Desert. London: G. Routledge.
1931b Lop-nor. Den vandrande sjön. *Ymer* 51: 121–153.
1938 Der wandernde See. Leipzig: Brockhaus.
1944 History of the Expedition in Asia 1927–1935. Part 1: 1927–1928. Stockholm. (Reports from the Scientific Expedition to the North-Western Provinces of China under the Leadership of Dr. Sven Hedin; The Sino-Swedish Expedition, 23)
1954 Mot Lop-nor. En flodresa på Tarim. Stockholm: Bonniers.

Hörner, Nils G.
1932 Lop-nor. Topographical and Geological Summary. *Geografiska Annaler* 14: 297–321.

Hörner, Nils G., and **Parker C. Chen**
1935 Alternating Lakes. Some River Changes and Lake Displacements in Central Asia. *Geografiska Annaler* 17 (Supplement): 145–166.

Huntington, Ellsworth
1907a Lop-Nor. A Chinese Lake. Part I: The Unexplored Salt Desert of Lop. *Bulletin of the American Geographical Society* 39/2: 65–77.
1907b Lop-Nor. A Chinese Lake. Part II: The Historic Lake (Lop-Nor). *Bulletin of the American Geographical Society* 39/3: 137–146.
1907c The Pulse of Asia. A Journey in Central Asia Ilustrating the Geographic Basis of History. Boston: Houghton, Mifflin, and Co.

Jarring, Gunnar
1934 Neue osttürkische sprachwissenschaftliche Literatur. *Le Monde Oriental* 28: 190–192.
1997 Central Asian Turkic Place-Names. Lop Nor and Tarim Area. An Attempt at Classification and Explanation Based on Sven Hedin's Diaries and Published Works. Stockholm: Sven Hedin Foundation. (Reports from the Scientific Expedition to the North-Western Provinces of China under the Leadership of Dr. Sven Hedin, 8; Ethnography, 11 – The Sino-Swedish Expedition Publication, 56)
1998 Agriculture and Horticulture in Central Asia in the Early Years of the Twentieth Century with an Excursus on Fishing. Eastern Turki Texts with Transcription, Translation, Notes, and Glossary. Stockholm: Almquist & Wiksell. (Scripta minora Regiae Societatis Humaniorum Litterarum Lundensis; 1997–1998, 2).

Joyce, T. A.
1912 Notes on the Physical Anthropology of Chinese Turkestan and the Pamirs. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 42: 450–484.

Katanov, Nicolai, und **Karl Menges**
1933 Volkskundliche Texte aus Ost-Türkistan. (Aus dem Nachlass von N. Th. Katanov hrsg. von Karl Menges.) Berlin: Verlag der Akademie der Wissenschaften.

Kious, Brent M.
2002 Hunter-Gatherer Nutrition and Its Implications for Modern Societies. *Nutrition Noteworthy* 5 (Art. 3): 1–5.

Kiviat, Erik, and **Elizabeth Hamilton**
2001 *Phragmites* Use by Native North Americans. *Aquatic Botany* 69: 341–357.

Le Coq, Albert von
1928 Von Land und Leuten in Ostturkistan. Berichte und Abenteuer der 4. deutschen Turfanexpedition. Leipzig: Verlag der J. C. Hinrichs'schen Buchhandlung.

Leche, Wilhelm
1904 Scientific Results of a Journey in Central Asia 1899–1902. Vol. 6, Part 1: Zoologie. Stockholm: Lithographic Institute of the General Staff of the Swedish Army.

Linné, Sigvald
1935 Dr. Sven Hedin's Significance to the Ethnographical Museum of Stockholm. *Geografiska Annaler* 17 (Supplement): 167–174.

Liu, Xiang Jiang, and **Guang Fu Hu**
2009 Threatened Fishes of the World. *Schizothorax* (*Schizopyge*) *biddulphi* Günther, 1876 (Cyprinidae). *Environmental Biology of Fishes* 85: 97–98.

Malov, Sergei E.
1933 Materialy po ujgurskim narecijam Sin-dzjana. Federovicu Ol'denburgu k pjatidesjatiletiju nauchno-obschestvennoj dejatel'nosti 1882–1932. Sbornik statej. Leningrad: 307–322.
1956 Lobnorskij jazyk. Teksty, perevody, slovar'. Frunze: Izd. An Kirgizskoj SSR.

Murdoch, G. P.
1968 The Current Status of the World's Hunting and Gathering Peoples. In: R. B. Lee and I. DeVore (eds.), Man the Hunter; pp. 13–20. Chicago: Aldine Publishing.

Murzaev, Éduard. M.
1966 Priroda Sin'dzjana i formirovanie pustyn' Central'noj Azii. Moskva: Nauka.

Norin, Erik
1932 Quarternary Climatic Changes within the Tarim Basin. *Geographical Review* 22/4: 591–598.

Pevtsov, Mikhail V.
1949 Puteshestvie v Kashgariju i Kun-Lun'. Moskva.

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

Przhevalskiy, N.
1879 From Kulja, across the Tian Shan to Lob-Nor. London: Sampson Low, Marston, Searle, and Rivington.
1885 Letters from Colonel Prejevalsky. *Proceedings of the Royal Geographical Society and Monthly Record of Geography* 7/12: 807–815.
1948 Ot Kjakhty na istoki Zheltoj reki. Issledovanie severnoj okrainy Tibeta. Put' cherez Lob-Nor po bassejnu Tarima. Chetvertoe puteshestvie v Central'noj Azii. Moskva: Gosudartstviennoye izdatiel'stvo geograficheskoy literatury.

Rockhill, William W.
1894 Diary of a Journey through Mongolia and Tibet in 1891 and 1892. Washington: Smithsonian Institution.

Ruan, Xiao, Qiang Wang, Pan Cun-De, Chen Ya-Ning, and **Hao Jiang**
2009 Physiological Acclimation Strategies of Riparian Plants to Environment Change in the Delta of the Tarim River, China. *Environmental Geology* 57/8: 1761–1773.

Schomberg, Reginald C. F.
1933 Peaks and Plains of Central Asia. London: M. Hopkinson.

Schomberg, Reginald C. F., and **Matthew Arnold**
1930 The Climatic Conditions of the Tarim Basin. *The Geographical Journal* 75/4: 313–320.

Sobania, Neal
1988 Fishermen Herders. Subsistence, Survival, and Cultural Change in Northern Kenya. *The Journal of African History* 29/1: 41–56.

Ståhlberg, Sabira, and **Ingvar Svanberg**
2006 Sarana in Eurasian Folk Botany. *Journal de la Societé Finno-Ougrienne* 91: 133–157.

Stein, M. Aurel
1912 Ruins of Desert Cathay. Personal Narrative of Explorations in Central Asia and Westernmost China. Vol. 1. London: Macmillan.
1916 A Third Journey of Exploration in Central Asia, 1913–16. *The Geographical Journal* 48/2: 97–130.
1920 Explorations in the Lop Desert. *The Geographical Review* 9/1: 1–34.
1921 Serindia. Detailed Report of Explorations in Central Asia and Westernmost China, etc. Vol. 1. Oxford: Clarendon Press.
1925 Innermost Asia. Its Geography as a Factor in History. *The Geographical Journal* 65/5: 377–403.
1928 Innermost Asia. Detailed Report of Explorations in Central Asia, Kan-Su, and Eastern Iran, Carried out and Described under the Orders of H. M. Indian Government. Vol. 1. Oxford: Clarendon Press.

Svanberg, Ingvar
1987a The Loplyks. A Vanishing Fishing and Gathering Culture in Xinjiang. *Svenska Forskningsinstitutet i Istanbul, Meddelanden* 12: 57–81.
1987b Turkic Ethnobotany and Ethnozoology as Recorded by Johan Peter Falck. *Svenska Linnésällskapets Årsskrift* 1986–1987: 53–118.
1996 Ethnic Categorizations and Cultural Diversity in Xinjiang. The Dolans along Yarkand River. *Central Asiatic Journal* 40: 260–282.

Thesiger, Wilfred
1964 The Marsh Arabs. London: Longmans.

Trébinjac, Sabine
2008 Le pouvoir en chantant. Tome 2. Nanterre: Société d'ethnologie. (Mémoires de la Société d'ethnologie, 7)

Xia, Xuncheng
1987 A Scientific Expedition and Investigation to Lop Nor Area. Beijing: Scientific Press.

Xia, Xuncheng, and **Wenkang Hu**
1985 The Mysterious Lop Lake. Beijing: Science Press.

Zhao, Songqiao, and **Xuncheng Xia**
1984 Evolution of the Lop Desert and the Lop Nor. *The Geographical Journal* 150/3: 311–321.

Zhdanko, T. A.
1961 Byt kolkhoznikov ryboloveckikh arteley na ostravokh juzhnogo Arala. *Sovetskaia etnografiia* 1965/5: 27–43.

Zhou, Tingju, and **Zhao Zhi**
1962 Migracii Tarima v ego srednem techenii. In: E. M. Murzaev and Zhou Lisan (eds.), Kun'lun' i Tarim. Ocherki prirodnykh uslovij; pp. 78–94. Moskva: Izdatiel'stvo Akademii Nauk SSSR.

Zu, Ruiping, Qianzhao Gao, Jianjun Qu, and **Mingrui Qiang**
2003 Environmental Changes of Oases at Southern Margin of Tarim Basin, China. *Environmental Geology* 44/6: 639–644.

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.

https://doi.org/10.5771/0257-9774-2010-2-423 - Generiert durch IP 216.73.217.60, am 07.05.2026, 20:31:47. © Urheberrechtlich geschützter Inhalt. Ohne gesonderte Erlaubnis ist jede urheberrechtliche Nutzung untersagt, insbesondere die Nutzung des Inhalts im Zusammenhang mit, für oder in KI-Systemen, KI-Modellen oder Generativen Sprachmodellen.