

Man and the Biosphere

The Chinese National Committee for Man and the Biosphere

SPECIAL ISSUE

ALASHAN

**Follow the Trails of Alashan Bactrian Camel
A Journey to Heed herdsmen's Call**



Alashan Bactrian camel.
Photo: Bai Ziqing

Alashan: a flower in a big garden

Narrative: Namjilcereng

I am a Mongolian of the Olot tribe. I was born in Alashan (a League which is a Mongolian administrative unit equivalent to a prefecture) in Inner Mongolia over 70 years ago and I grew up here. One day when I was small I went to collect firewood by cutting down branches from a living tree. My grandfather gave me a good scolding and it is a lesson I have never forgotten.

Our nomadic tradition is not a product of just a few hundred years, it has taken millennia to develop: A millennia of snow, wind, drought and flood. Our forefathers couldn't stop these natural disasters from happening but they could cope with them by practicing a nomadic lifestyle. The nomadic lifestyle is a way of adapting to local conditions in the face of so many natural disasters. Humans have domesticated more than 400 different kinds of animals but here only five were eventually accepted as farm animals. These are horses, sheep, cattle, camels and goats. The other kinds of animals just can't cope with the environment here. When we go out into the mountains with our herds, all around us is the sky above and the plateau below. Heaven and nature are both circular, and our culture grows in circles too. Our sheep pens are round because this shape is able to withstand strong winds without collapsing. Inside our yurts, our skylight in the roof and the stove inside are both circular too following nature's pattern. Our nomadic lifestyle and our adoption of the circular shape is our way of adapting to nature. It seems to me that the main differences between farming animals and the nomadic way of herding animals is that farms are settled and don't move around and they also use a lot of square shapes, for example their fields, their homes and their windows. Nomads, however, are always on the move and they use a lot of circles. Farming tries to control nature. Farmers sow their crops in the spring and harvest them in autumn, leaving nothing behind. The nomadic lifestyle has sprung up in regions where farming is impossible. It has to work with nature and also protect natural vegetation. If you simply take the ideas behind farming and try to transplant them here, then you are going to create a lot of problems.

On 5 May 1993, the whole country was shocked when a heavy sandstorm struck Alashan. It was then that the problem of desertification was brought to light. It is also possible to prevent disasters from happening without knowing the real cause of the problem. All my 70 years I have been involved in trying to promote ways to stop these disasters which are destroying our environment.

All the elders know that in the old days, Alashan had strict migration policies. If you wanted to live here you had to apply to the authorities and have someone influential sponsor you. Even the length of time you could stay here was limited and there was a heavy tax. After 1958, though, outsiders began arriving in large numbers, their percentage having jumped from 10 per cent before to 60-70 per cent now. With so many extra people, great efforts have been made to boost agricultural output so that we can become self-sufficient in grain and fodder, even though local conditions might not be able to sustain this. I began working on grassroots projects and then took part in land reclamation projects. We made seven or eight attempts to set up new farms with plots of land of around two to three hectares or even up to 10 hectares each, wherever land and water were available. Even though we used up all the water, the crops always failed. As the numbers of people grew, demand for firewood also rose. People started cutting down the saksaul (Haloxylon ammodendron) trees and clearing small shrubs for firewood. Trucks, horse-drawn carts and camel caravans all came to haul this wood away for use in the people's communes, factories, army bases and offices. From that point on, people gradually left the nomadic lifestyle and started thinking only about economic development and forgot about the environment.

Another reason for our problems is climate change but I can't say much about this. After all it is a global issue. The people from Alashan in their 70's and 80's heard from their grandfathers that in the old days flooding was so bad that rocks the size of cattle were carried downstream in the river. There was so much rain then. In my lifetime, I have seen the climate get obviously drier and drier. When I was young, I often took a raincoat out with me when I went out herding. Everyone did in those days. Now hardly anyone even owns a raincoat because it hardly rains. Over the past decade we have had three or four extremely dry years. Droughts can last as long as 10 years. Alashan suffered a 10-year-long drought from 1980 until 1990.

After the animals and land were distributed to individual households, the nomadic lifestyle almost completely disappeared. Before this, animals and land were owned collectively by the production brigade. The camels, cattle, horses and sheep each had their own grazing land and were looked after by designated herders. After the "Household Contract Responsibility System" was introduced the number of fields increased and there was no space left for moving around with your herd. Households began keeping different kinds of animals on just one plot of land which is against nature. I was also involved in implementing the "Household Contract Responsibility System." It happened all at once and no one considered the possible bad consequences of it at all.

It is important to protect the environment but to enforce a long-term grazing ban is just overkill. This is simply shifting the blame onto the animals and their owners without really investigating the under-lying causes of the ecological degradation such as policy-related problems. I often ask myself why so many policies are inappropriate. They are either too "leftist" or too "rightist." We still don't understand how the nomadic lifestyle developed and how it makes use of the land but does not harm it. It seems we have reached a stage where if we want to continue developing we must return to our original culture and our traditions. In the old days our ancestors prayed for nature's protection through religious rituals. These days we try to understand nature through scientific research.

Our country has many different kinds of environment and many different kinds of cultures. They are like flowers of all shapes and sizes in a garden. Alashan is just another flower in this garden adding to this beautiful landscape and blooming along with the rest of the country for the world to admire.

(Namjilcereng was born and grew up in Alashan. He is the former Director of the Animal Husbandry Bureau of Alashan juun hoshuu(Left Banner). His nickname is "walking compass," and he is a self-taught camel expert.)

Man and the Biosphere

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The people of Alashan have long relied on the Bactrian camel for their livelihood. In the old days, many people made their living from driving camel caravans. Today, with fewer camels, a camel caravan like this one is a rare sight.
Photo: S. Hasbagan



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Traveling with a Camel Caravan



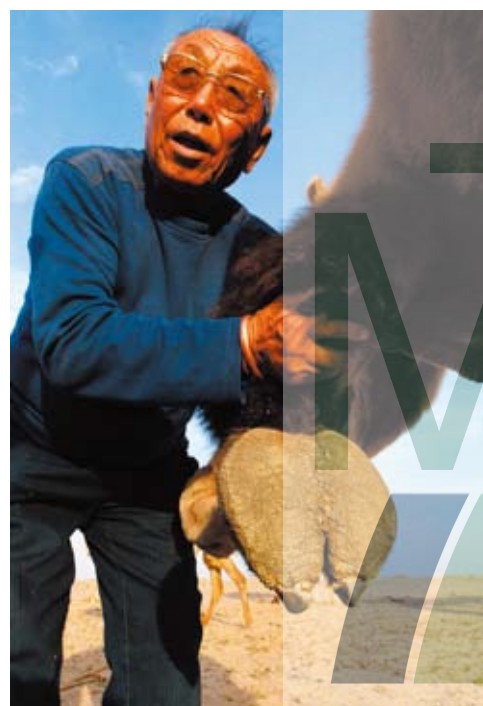
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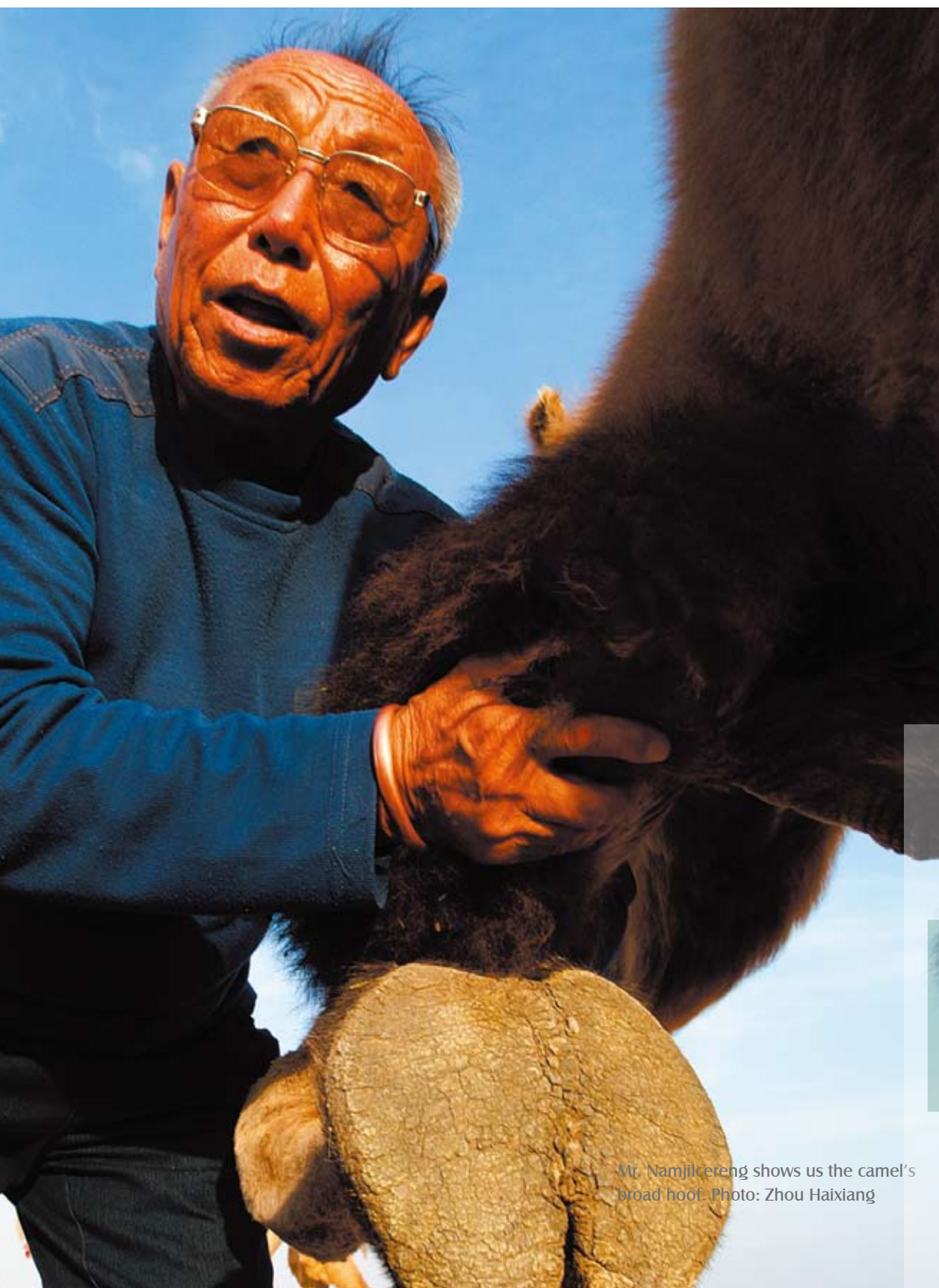
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Man and the Biosphere Programme launched by the UNESCO, is a global scientific programme related to the relationship between mankind and the environment.



Alashan was once called a 'country of camels.' Every autumn the camels would come back home after gaining weight. When the camels return in a big group like this the locals come to find their own animals and take them home. Such a spectacle is very rare these days. Photo: S. Hasbagan



Mr. Namjilcereng shows us the camel's broad hoof. Photo: Zhou Haixiang

Me and my Camel

Namjilcereng

Camels drinking. The locals say that it is easy to rear camels. As long as you give them water they will always come home eventually. Photo: S. Hasbagan



Out of the five main domesticated animals used in the desert, the camel is the best able to deal with severe water shortages. It can survive on just some plants and no water for many weeks at a time. When I was small, an otherwise healthy male camel caught some kind of skin parasite. My grandparents said he could not be cured and so he should be kept apart from the rest of the herd because the parasite could spread. So we dug a deep pit and put the

camel in there and tied it to a steel ring. I went back 42 days later and it was still walking around in the pit. It was only May but the weather was really hot and all the camels had already shed their winter coats. The next day I went back to the pit but the camel had gone. Someone told me that they had seen the camel in the desert drinking water but even though I searched high and low I couldn't find him. We all thought that person must have been mistaken

and the camel must have died. But in November that camel came back home all by itself. He was well fed and had completely recovered from the skin disease. He survived 42 days without food or water and still managed to escape from the pit. I saw him come back with my own eyes.

I heard of one experiment where a camel survived without food for 72 days. Other domesticated animals can only last for a couple of weeks at most. Camels are able to put up with extreme hunger and thirst. Drivers of camel caravans know that camels can carry heavy loads and still go without food or water for up to 15 days. There is a local saying that goes: "One good year can carry a camel through three dry ones." The camel can feed well on sparse grassland whereas other livestock can't. It is very well adapted to an arid environment. Although the horse is faster, it cannot compete when it comes to surviving without food and water. On journeys greater than 15 kilometers, because of its better





Camel race. Photo: S. Hasbagan

endurance, a camel is actually faster than a horse.

Some people also believe that camels can draw in moisture through their skin during the night if it is humid and this helps them recover from a hot and thirsty day. The camel stores fat in its humps, which act like fat warehouses. When there is no grass to eat, the fat in its humps can be converted into energy.

The camel is not bothered even when land surface temperatures can soar up to 70° C at the height of summer. We have another saying which goes: "Heat can kill a sheep but never a camel." In really hot weather the sheep try to hide in the shade and lower their heads, just like they are trying to bury themselves in the sand, but the camel stretches his head up towards the sun just like a sunflower. The hotter and more intense the blaze the more likely the camel is to stretch towards the sun.

Although the desert vegetation grows quite sparsely, it is enough to fatten up a camel. Camels like to feed on short plants such as *Corispermum patelliforme* and

Agriophyllum in the summer and on shrubs in other seasons. In a normal year, camels can practically go without drinking in the summer and autumn months. They can even put on weight provided they don't do much traveling. Some camels go off by themselves after they have shed their coats in the summer but they always come back in the autumn. They never get lost.

Camels are quite happy to eat *sacsaoul* (*Haloxylon ammodendron*) and *kalidium* (*Kalidium foliatum*) and grasses of high salinity that other livestock won't touch. There is a kind of thorny grass here that we call spiny glorybind (*Convolvulus tragacanthoides*). During a drought only its thorns remain. The other animals won't go near it but camels will eat it. At our place here, the camels have plenty to eat but the other livestock go hungry because they are fussy about what they eat.

The camel is the most important means of transportation in the Gobi. Like horses they have to be tamed and trained before they can be used to pull loads or ridden. Training usually begins when the young camel is about

three or four years old and starts with the insertion of the nose peg. Although the camel doesn't look very intelligent it is actually quite a smart animal. After a week or so of training, a camel can recognize its trainer. Later on the camel will only let its master ride him and will shake off a stranger. The best time to train a camel is around drinking time when it starts to use its nose a lot, making it easier for it to remember its master's smell. The trainer will give it instructions such as "come and drink" while leading it to water. A trainer will pull on the nose peg to tell it to kneel down. A well-trained camel will come when called, even from a large distance, and will kneel down, get up and pull loads on command.

You can leave camels to graze freely. They won't run off unless the land is extremely dry and there is nothing to eat. Camel herders always know where their camels are, and they don't have to worry about them running away.

Every time the camel drinks, its memory of its home and its master is reinforced. Camels don't like to mix, even with camels that live nearby. They will seldom drink at

another household's drinking hole. Even when several camel herds are mixed together they will go their separate ways in the end.

The camels in Alashan are semi-domesticated. After shearing in the spring, they go off on their own to feed and come back in late autumn or early winter. They will never forget where their home is or who their master is. Even some camels that have been sold to someone else sometimes make their way back to their original home. In the spring,

a male camel that is ready to mate will take care of a herd of non-pregnant females without losing any. Every night he will herd them all home. Baby camels are born after a gestation of roughly 405 days -- the range is 398 to 412 days. If the mother is well fed, the baby can be born even earlier.

If a baby camel is born weak, some people wrap it up in a quilt and take it away. But if the baby picks up the smell of a stranger on its skin then its mother will reject

it. To persuade the mother to take her baby back, camel owners sing a "kes, kes, kes" tune and play the fiddle to her. In a few days, the mother will start crying and allow her baby to feed again. It happened to me and so I sang the tune to a camel mother.

The old folk believe that camels can predict the weather. If a camel lies down in winter straight after drinking then we know it means that the weather won't change for a few days. If it goes off with other camels and lies down away from the wind straight after drinking we know the weather is going to change soon. If the camel runs off with the wind after drinking it means the weather is going to change imminently. When the camel starts grazing on a flat area that is normally windy it means the weather is going to stay fine but when it walks off to eat at a place sheltered from the wind or grazes among dense bushes, it means the weather is going to change soon. In the summer and autumn, camels like to walk into the wind because it helps them cool down. In the winter, whenever they follow the wind it means the weather will change.

In the old days, we used to drink camel milk and it satisfied both our hunger and our thirst. If you ever get lost in the Gobi, you can just let the camels lead the way and they will take you to water even if the nearest watering hole is 10 or 15 kilometers away. They also know their way home. They love to go back to their home. You are never lost if you stick with your camel. A camel always lies down on the ground facing the direction of his home. It will head home even when the grazing is not good there.

There are lots of old camel herders who can remember the days when they would get drunk, climb up onto their camel, fall asleep totally smashed, and let their camel take them home. In Alashan, the night-time temperatures can



Milking camel. Photo: S. Hasbagan



Camels are sheared in the spring. As they are semi-wild, they are capable of just going off by themselves in the summer and finding their own food. They come back home in the autumn. Photo: S. Hasbagan



drop to minus 20 or 30 °C in winter. If you did not have your camel to take you home, you would be frozen to death for sure.

The camel is a smart and communicative animal. The desert people know that it is special compared with the other animals. Herders spend every day and night with their camels and know their herd so well that they can recognize their animals instantly, even from a distance. They depend on them to predict the weather and to help him find water. Good herders can read a lot from camel prints in the sand. They can tell if the camel belongs to them or not, when the prints were made, and whether the camel was running or walking.

When camel herders meet and chat to each other, they talk about their camels just like they are their own children. It is heartbreaking when they have to sell their animals. A camel realizes when it has been sold. As it is led away by the new owner, the camel will turn its head to look back at the owner and it cries big tears. If you've never heard a camel cry, the sound is unimaginable. The sound is so heart-rending that women hearing it would turn their heads away because the scene is so painful.

Behind the numbers

– the fate of the Alashan camel

Written by: Bai Ziqing

Photo by: S. Hasbagan

The number of camels in Alashan reached a peak of 251,000 animals in 1982. However, today only about 72,000 are left, according to official figures. Along with the camel's drastic decline, the area has undergone tremendous changes in connection with grazing-related policies.

"The camels are very important for the people of Alashan," a herder who had lost all his camels told us. "We can use its hair, its meat and its milk and that alone means we don't need any other livestock. Every day there are less and less camels and if it carries on like this, one day there won't be any left." We had just arrived in Alashan. He was part of a bigger group of herders who had all lost their camels. Some had moved to the city while others now just tended flock. The old folk all had the same message that they wanted to tell us: Camels were an essential part of their lives and that they would all disappear if something wasn't done about it.

What has happened to allow such a situation? Through our investigation we pieced together the puzzle of this vanishing species.

Roaming free

It was very difficult to reach the ghacaa (Mongolian village) of Altan Oboo Balgas (town), in Alashan Baruun Hoshuu (Right Banner). The herders knew we were coming and so they got together a small herd of around 30 female camels with their calves to show us. In the past, such a herd would have been quite common, but nowadays it was rare.





One of the diet grasses of the camels – saksaul.
Photo: Zhou Haixiang

On our way to the ghacaa, across the Gobi, we spotted several camels. We had heard stories of hundreds or even thousands of camels traveling together across the desert but such a sight is never seen these days and is unlikely to return. It was sunset when we approached this herd and it was our first close encounter with camels.

The mild-looking and round eyes of the camel looked strange compared to its large body size. However, when we got closer we could see that there was a wildness behind the initial impression of timidity.

“Before Liberation [1949], camels were the main livestock in Alashan. Although some families had cattle and horses, their numbers were not that large. It was the same in my home. When my great grandfather was young, my family owned about 1,000 camels. We had some small livestock but we raised them just for their meat, which we ate ourselves. When I was a small boy we had about 200 camels and a few dozen small livestock,” Namjilcereng told us. He was a retired Director from the League Animal Husbandry Bureau. He was already over 70 years old and while he traveled with us he told us stories about his childhood.

As the sun was setting we looked out across the desert, a scattering of bushes on some rocky terrain. This area is part of the Gobi. “The camel is best suited to this land because there is often some kind of drought and the only animal that can deal with that is one that

travels far and wide. I was the Sumu Da (township head) near here in the 1980’s, and there was a drought in eight out of 10 of those years,” he constantly reminded us.

The natural environment here is truly harsh. Knowing that drought gripped this place in eight years out of ten, it is clear that only animals that can deal with water scarcity can survive here. Livestock like cattle and sheep/goats can’t stray too far, maybe a few tens of kilometers from home. Camels can roam a long way and so they can travel around the rest of the land – that is tens, hundreds, or even hundreds of thousands of hectares. That’s why the numbers of camels swelled to 251,000 in 1982.

This herd of camels belonged to the former Party Secretary of Gurban tulga Ghacaa in Altan Oboo Balgas. In 1959 he left school and was then elected ghacaa head in 1961. His family owns some 100 goats and 70 camels – that’s one of the biggest camel herds in the region.

“The camels are semi-domesticated and not like the other farm animals. They don’t need humans to look after them, they know where to find food in the desert. After shearing in the spring the camels will take off by themselves. Sometimes they can roam so far that they cross out of China. But now the land has been distributed they don’t have anywhere to go. Just like our nomadic culture, the camels are also dying,”

the old man said, identifying land distribution and the Household Contract Responsibility System as the main causes of the camels' decline. Although he still had some camels of his own he sounded desperate and worried about the future.

Trapped in the desert

At Haisan culuu in Alashan baruun hoshuu (Left Banner), we came across the dried-up remains of what must have once been a majestic river. The terrain had been eroded by wind and water. Strange rock formations stood on either side creating a huge labyrinth. In the middle of all these rocks grew some low bushes and we spotted a few small groups of camels roaming around.

Erdeni Dalai is 60 years old and this is his land. More than half of his holding is made up of stony ground with odd rock formations like this one. He is planning to set up a tourism business and wants to attract sightseers here by offering free entry. "My family started living here in the 1960's. This land is special, it's mostly Gobi and quite barren so each family was given tens of hundreds of hectares of land when it was all allocated in 1984. My family received 26,000 hectares." Since he had mentioned his family we decided to ask him what he thought about the Household Contract Responsibility System.

To people who live in the cities an area of land that is tens of hundreds of hectares in area appears to be astronomical. Several of our team members joked with Erdeni, saying that with such a holding he could call himself king. However, Erdeni didn't seem to find it amusing. "In the old days, the balance between the vegetation and livestock was maintained by our nomadic practices. The livestock would move on after eating some of the plants but the area would never be over-grazed. Before they started allocating the land, our two ghacaas had only 2,000 sheep and all the rest of the livestock were camels. Why? Because this kind of land is best suited for camels. But then they brought in the Contract [Household Responsibility] System which just copied what was happening outside and didn't take into account the local conditions here. Before the Household Contract Responsibility System, our township had over 10,000 camels. We were only one of the three townships in Alashan that had over 10,000 camels. But today there are only a few thousand camels left. And although it looks like each family has been given a huge area it's not enough for the camels."

He continued: "Most of the camels in this region come from the Badain Jaran Desert in the summer to drink the lake water and eat. When they come out of the desert here they put on weight and grass seeds get stuck on their bodies which are spread across the land.

"The camels don't just need enough area for grazing, they also need enough space to wander. While





The roots of the Euphrasian poplar are exposed as the result of land erosion, an indicator of the environment degradation.
Photo: Zhi Feng



you can raise sheep or goats in fields, the camels need freedom. They head off to a particular place to eat a certain type of plant according to the season. After they distributed the land there's not enough variety in each area of land – even though it is large – for the camels. In my 26,000 hectares there's not enough salty grass and lake water for my camels. So, you see, even a large area of land may not be enough for the camels.”

Erdeni has spent many years looking after camels and he understands their needs. It is from this background that he can explain why the land distribution is not good for camels. He is a true herder. Namjilcereng, the former herder and League Animal Husbandry Bureau Director, who was traveling with us, agreed with Erdeni.

“Before Liberation, we lived in yurts and used to travel with our animals. We would head to a certain pasture depending on the season, provided no natural disaster prevented us. When there was terrible weather we would move away.” People have belittled the nomadic lifestyle, calling it “backward” and “primitive,” but in fact this way of life follows the laws of nature, and is a valuable concept.

“Collectivization began after Liberation. A Production Brigade was formed and assigned people to tend camels, sheep and other livestock. Others were ordered to drive the caravans, build livestock sheds and pens and even deliver fodder and water to the grazing stations. Every person was appointed a special job to do. That meant that individual households did not own their own livestock but everyone in the household had a job to do that was given to him by the ghacaa leadership. In the 1980's, like elsewhere in China, these collectives were abandoned. In Alashan, livestock were distributed among individual households in 1983 and 1984. Because camels were the most useful, everybody wanted more camels when the animals were being distributed. Families competed with each other to get the most camels. Enormous herds were broken up and divided into smaller ones and given out to families. But in these smaller herds, the male-female balance was upset. That year many females did not fall pregnant and so there were fewer baby camels. Camels only give birth once every two or three years and so the loss was quite heavy. The animals were handed out in proportion to the number of people in a household. Each family got some camels, sheep, horses and donkeys which meant that each family had to know how to take care of all these different animals and everyone was very busy. A lot of families didn't know how to take care of camels and so they sold them. And that is how, naturally, the number of camels has fallen.

From official statistics, the number of camels in Alashan reached a peak in 1982, and then it dropped dramatically. After the livestock were distributed, the authorities set about parceling up the land on the vast

Gobi and allocating that out too.

Namjilcereng said his memory of life in the collective period is very clear. Camels, he said, are very different to other livestock because they need to eat very different kinds of vegetation. They like to eat saltyplants, such as sagsaoul (*Haloxylon ammodendron*) and kalidium (*Kalidium foliatum*), which the other animals cannot eat.

Camels know where to find the plants they like to eat, for example they can locate desert rice (*Agriophyllum squarrosum*) in the autumn and salty plants by the lakes in the winter. Flock tends to feed close to home, but camels can roam far and wide when they graze. For example, it is very common for a camel to stray as far as 20 or 30 kilometers from home. Sometimes it can roam as far as 100 kilometers away. After the livestock were distributed to individual households, everyone began looking after animals including those who never used to, such as those people involved in transportation and sideline production. This meant that there was an explosion in the number of homesteads and people were everywhere. They started putting up wire fences to mark each household's allocated land. This meant that the camels couldn't roam freely anymore. "Some people suggested keeping the camels in paddocks and they started to do that at Jirantai. But even though the paddocks had lots of plants, the camels lost weight and their hair lost its gloss," Namjilcereng said.

People such as Erdeni and Namjilcereng have witnessed how the nomadic lifestyle has been killed off by the Household Contract Responsibility System, but they are powerless to change it. Camels have suffered badly from these changes too.

White gold from cashmere goats

During our investigation we found that while the number of camels has plummeted, the number of cashmere goats has risen steeply. In 1982 there were 251,000 camels and 871,000 cashmere goats. In 2005, there are only 77,000 camels, and 1.455 million cashmere goats.

The reason for this is a growing demand for



cashmere, a fabric that is often described as "soft gold" or "white gold." The price of cashmere began climbing dramatically from the beginning of the 1990's. By 1994, it had risen from US\$ 13 to US\$ 58 per kilo on the international market. Meanwhile, the price of camel wool has stayed steady at about US\$ 6 to US\$ 8 per kilo. Cashmere from Alashan goats has become famous for its softness, sheen and whiteness. In some circles it is known as the best cashmere in the world, which has created a craze to rear cashmere goats in Inner Mongolia.

Buyanbilig is 70 years old and has been looking after animals almost all his life. He told us candidly:

"Everyone is talking about protecting the camels and I agree. But how can we help raise the living standards of camel owners? Rearing camels is less profitable than cashmere goats. The income from an adult camel is about the same as what you can get from a two-year-old cashmere goat. That is why more and more people are giving up their camels and turning to cashmere goats instead. That's why cashmere is known as 'white gold'."

Namjilcereng said he felt helpless, adding: "In the old days, people didn't keep many sheep or goats in Alashan. If we kept them then we would just rear them for their meat. The problem is that everyone wants to

buy cashmere, but no one wants to buy camel products. Should we try and start a market in camel products? The wool and milk are quite valuable, especially the milk. There are some scientists who say that camel milk contains ingredients which can help fight cancer. But a single camel cannot produce much milk –less than half a kilo a day – and will only let her owner, with whom she is familiar – milk her. The other problem is that camels can't be kept in penned-up; they need to be able to roam around. But the key problem is that the government hasn't helped so far to address this problem."

Some say that Japan has spurred most of the

demand for cashmere. Although we cannot ignore market forces, we should also make sure that wherever the market is driving us, it is a good and healthy direction, in this case, the right direction for the desert rangelands. If we let market forces take complete control, then all the camels will be replaced by cashmere goats, even though camels are much better suited to the local ecology.

No space for our camels

We have investigated the changes to livestock and how market forces have helped shaped that. But how is the camel faring in this situation?

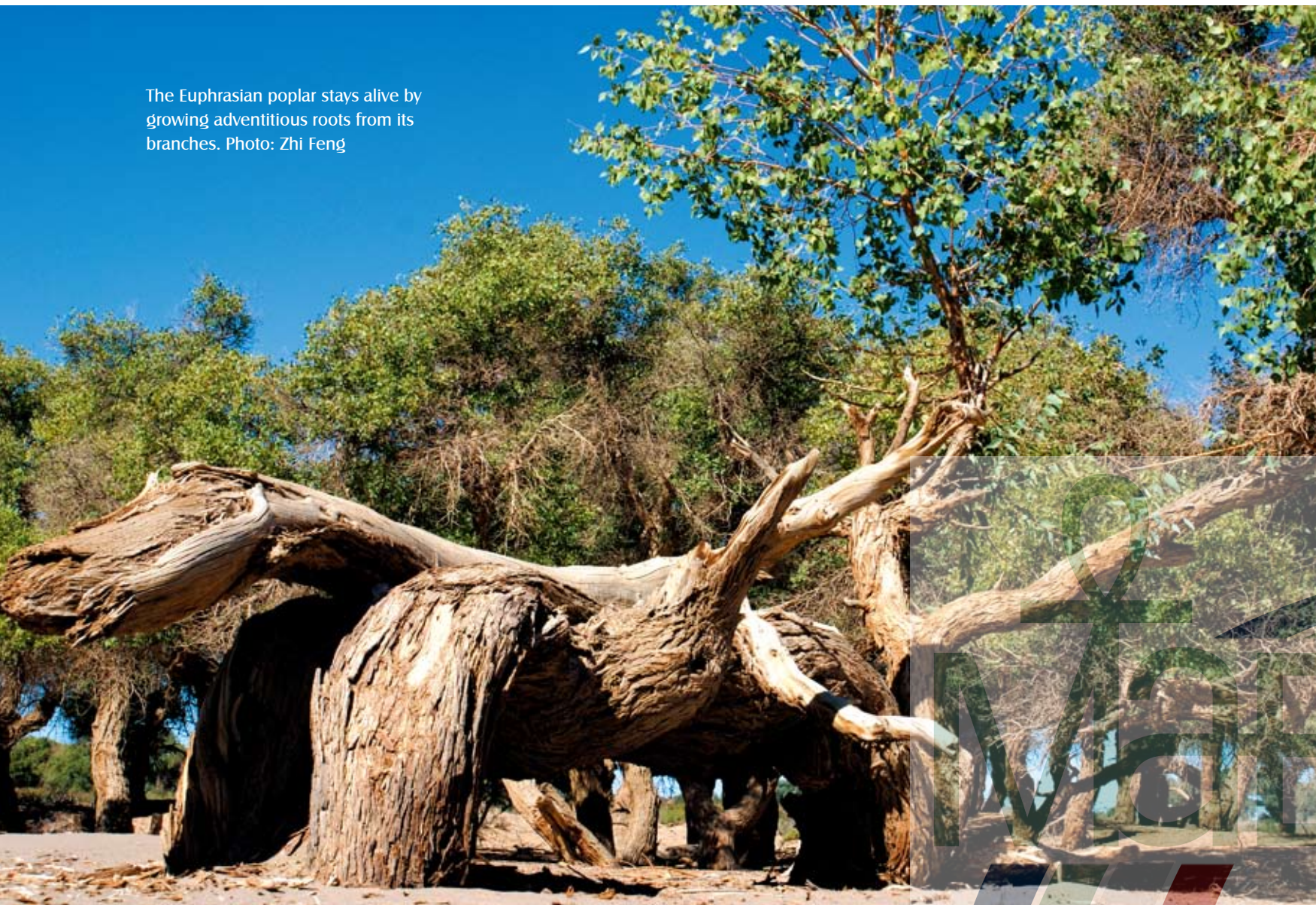
Throughout our trip, we heard a lot of people talking about recent policies to stop livestock grazing in a bid to help restore the grasslands and also re-

forestation projects to help reverse desertification.

The policy to reduce grazing was launched in 1999, and it was first applied to the Helanshan Mountain region but then gradually extended to the whole of Alashan. Degraded rangelands are fenced off and a grazing ban is applied within that area. The purpose is to allow the vegetation to grow back and let nature help restore the rangelands.

At the same time another policy, this time to promote re-forestation has been adopted in Alashan. Its aim is to protect the shrubs and small trees that grow sparsely in the region. The Grazing Ban is usually enforced for a period of five years, but the reforestation efforts are more long-term. Both areas are fenced off with barbed wire and many of the nomads are encouraged to

The Euphrasian poplar stays alive by growing adventitious roots from its branches. Photo: Zhi Feng



The calligonum mongolicum is a xerophil (plant adapted to a dry environment) and the setas outside its fruit are vascular bundles. Photo: Zhi Feng

relocate to cities or special Migrant Zones and they are given subsidies to start different kinds of businesses. In some areas, many people have totally given up all their camels and so camels have become very rare in those places.

After a couple of years, the degenerated rangelands do appear to be recovering in some of the fenced-off areas. But the nomads say they can't be stopped from grazing their livestock forever. They also say there are Grazing Bans in some areas where there is no serious rangeland degradation.

"The government has been trying to get us to give up our camels since last year but many of us are resisting. Some of us feel like crying when we are told we have to give up our camels. They have stopped us from raising livestock or grazing and so we can't buy butter tea anymore and we don't have enough money to buy meat.

"In fact the vegetation suffers if livestock are not allowed to graze on it. The frutex we call bawang (*Sarcozygium xanthoxylum*) is like that. It just stops growing if it is not trimmed by grazing animals. I think there should be restrictions on grazing but there should be some flexibility.

"They are blaming the animals and that is wrong. It is the humans' fault. So after all the animals are gone, who are they going to blame then?"

We met several old camel herders in Luanjingtan. They were all in their 60's. They had spent all their lives looking after camels. They still kept their camels not

because they could make any money out of them but because they were still attached to them. The Grazing Ban has made their situation even more difficult.

"The camel is a poor creature. People use its hair, drink its milk and use it to carry heavy loads. In the old days, even a poor family could survive as long as it kept a few camels. Why can't we leave some room for the camels so that they can live here too? With all the land fenced off, our camels are always being chased away. These people driving their cars around are supposed to "protect the environment." They are supposed to be working to "help the grasslands." But they are mean and chase the camels with their cars. You know, in the summer and autumn, the camels shouldn't be harassed. They should be spending their time feeding and fattening up for the harsh winter. In the old days of the people's communes, camels were never loaded up or ridden during fattening-up season. If you rode a camel during this time, people would criticize you because the camels were thin and weak and could easily lose weight. If you make them sweat they can easily get a skin disorder. If you chase them from behind they can get scared and even fall down and break their legs. Some even die from exhaustion. Why do they have to chase our camels like that? Why can't they give some space for the camels to live?" one old man kept asking us.

"Why don't they make the right policies for our land?" he said.



Photo: S. Hasbagan

Traveling with a Camel Caravan

Bai Ziqing





A camel caravan taking a break.
Photo: S. Hasbagan

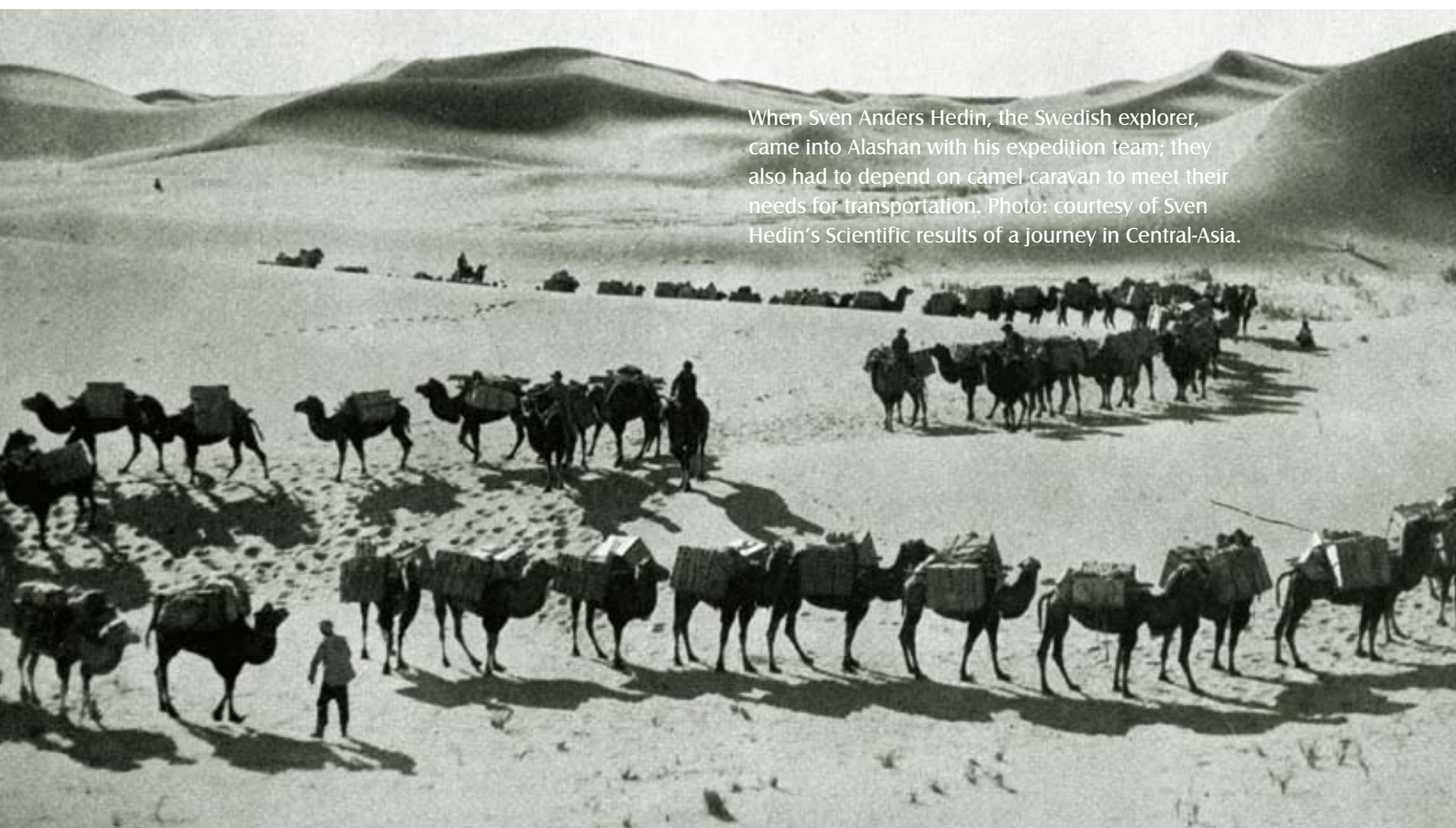
“In the old days a family knew everything would be alright as long as they had a couple of camels,” reminisced one elder fondly.

The camel used to be a very important animal in this part of the world. While families could get all their meat and milk from their livestock, they needed to buy necessities such as grain and tea. Camel caravans used to be a very profitable business, carrying salt out and grain and tea in, the same way that trucks carry goods today. In the deserts of Alashan, camel bells could be heard ringing right from the onset of winter. Those herdsmen who had been working hard all year getting their sheep fattened up would set out, round up their camels, load them up with salt harvested from the salt lake, and then take off into town with their caravan.

Isige is 62 years old and he lives in the Hoyar hudug (Luanjingtian) Migrants Zone in Alashan juun hoshuu (Left Banner). He has spent most of his life herding camels and traveling with camel caravans. When we started talking about the caravans his eyes began to mist up. He talked about the camels with affection and it was obvious that he holds them in great esteem, calling them “mother.” He is very grateful to his camels and is truly fond of them. “We used to totally depend on the camels. They were just like mothers to us,” he said. “We lived in the Tengri Desert where there are salt lakes. Many families could earn their living by using a few camels to carry salt to Zhongwei in exchange for grain. We had salt caravans when the Alashan area was ruled by local Mongolian princes [before 1949]. It wasn’t only Inner Mongolia that depended on the salt caravans. The interior of China did too, such as Shaanxi, Hebei and Shanxi Provinces. Even during the collective period, we still got our main income from the caravans which then belonged to the ghacaa (Mongolian village). Mutton was too cheap to sell so we just ate it all ourselves.”

Within Alashan’s borders, there are 53 salt lakes of various sizes, the largest two being Jirantai and Yabulai. Smaller salt lakes are mainly located in the Badain Jaran and Tengri Deserts where there are about 162 million tons in salt deposits. There are 10 places producing natural alkaline salts with total deposits of 570,000 tons and 30 saltpeter-producing sites of about 100 million tons in total. Before highways and cars, the camel caravan was the only way to move the salt and minerals out. Nearly every family that lived near a salt lake would be involved in the salt caravan trade and even some families who lived quite far away.

When Isige was young he used to be a caravan driver. The caravan would set off at the end of the ninth or the beginning of the tenth lunar month. They would travel for about four months. In poorer households, boys as young as 13 would join the caravan. A round trip to the nearest neighbouring city, Zhongwei, took at least 11 days from the Tengri. In good years, when the camels were well fed, the caravan would make several quick



When Sven Anders Hedin, the Swedish explorer, came into Alashan with his expedition team, they also had to depend on camel caravan to meet their needs for transportation. Photo: courtesy of Sven Hedin's Scientific results of a journey in Central-Asia.

trips. Traditionally, you weren't allowed to sell salt unless you had a license so the caravan drivers would only be responsible for the transportation side of things. Isige said he remembered caravans making about 6 or 7 silver dollars per trip before 1949. Sometimes they could make up to 11 or 12 silver dollars. With half a kilo of meat costing about 30 to 50 cents and half a kilo of grain costing eight cents at that time it was good money. The caravan left the salt at the wholesale depot which would log in the shipping fee. The caravan driver then went to buy oil, grain and other goods and the depot would pay the shop owner. After a couple of such trips a camel would be exhausted and so he would be released to recover but the driver would carry on with new animals.

Most families relied on the camels as their main source of income. If a family was short of labor they could easily earn enough money for grain by renting out their camels to a caravan driver.

We met another old former caravan driver whose name was Urtu Nasun. He lived in the Badain Jaran in Alashan baruun hoshuu (Right Banner).

"Badain Jaran is famous for its three big salt lakes. All you have to do is dig it up out of the lake and then leave it to dry. The salt is clean and the lake doesn't freeze in winter. We eat that salt ourselves too and it is

tasty."

The old man was happy to talk about the old days when he trained camels and traveled with the camel caravans. It sounds romantic, but caravan life was actually tough and required a lot of experience and knowledge from the drivers.

Normally each caravan had only one driver and the numbers of camels depended on the driver's physical strength. Every night, when the caravan stopped to camp, the driver needed to unload all the camels so that they could rest overnight. And then every morning, he needed to load them up again. Each camel could carry two packs, about 75 to 100 kilos on both sides. Loading and unloading was a strenuous task and so a single caravan did not normally have more than 15 camels. A single person working by themselves couldn't load and unload a camel so the caravan drivers would often help each other. Teams of eight would work together and then share the same tent overnight. It was also important not to have too many camels because then it would just take too much time every morning to set off.

Young camels start training at two or three years old. Although a small camel looks quite gentle and tame, without training it can be quite unpredictable. Camels have to be broken in and taught to accept a rider or to accept a load, they won't do it naturally. Young males

are castrated and have their noses pierced with a peg at this time. Over time they gradually accept being saddled and then ridden. After some training they will understand some simple instructions such as kneeling on the ground so that they can be saddled or mounted.

After training, a camel is ready to join a caravan. Young camels don't have to carry heavy loads. The string that is attached to the nose peg is tied loosely to the saddle of the camel in front. The length of the rope is just right to discourage the camel from stopping to feed along the way but long enough so that there is always some slack to protect the camel's nose. The optimum length is between one to two meters.

The slower camels with shorter legs are put at the front of a caravan while the long-legged fast walkers are at the back, otherwise the slower ones wouldn't be able to keep up. The most important camels in a caravan are the ones in the lead and the ones at the back. The lead camels have to be very obedient and calm in case the driver has to stop the train and deal with something. If the lead camel is skittish it might set the whole caravan out of control. The rear camel needs to be taught how to swing its body while walking so that its bell will ring out.

Urtu smiled when he remembered his lead camels



A camel bell is not a delicate object. It is heavy and oblong-shaped and is tied to the pack on the last camel in the train. It produces a loud and resonant chime. Photo: Chen Yang

which were intelligent and obedient and his rear camels who were also smart and made the bell ring out so nicely. A camel bell is nothing exquisite. It is rectangular, about 30 centimeters long, and made of cast iron or copper with an iron clapper. It is hung on the saddle, not around the camel's neck, and would weigh in at 1.5 to 2 kilos. Each caravan had just one bell attached to the rear camel. The driver would ride the lead camel and relied on the sound of the bell to make sure nothing was wrong with the caravan behind him.

Urtu's caravan had 12 camels and they carried salt across the rough terrain of the Badain Jaran. Any further and the caravan may have had problems staying together. He would join forces with about another eight men and they would share a tent at night. Together there would be about 100 camels. All the camels at the back would swing their bodies as they walked so that the bells could be heard far into the distance. "Making the bell ring out requires some skill. Without it the caravan would be quiet. In some places the bell can be heard from 10 kilometers away and each bell has a distinct sound so that you can tell who it belongs to. Sometimes a camel might move so hard that it would break the bell," Urtu laughed.

Because not any camel is able to move in the right way to make the bell ring out while walking, a caravan usually sticks to the same rear camels. When they hear the sound of the bell, the camels would get excited and energized just like people listening to music. Sometimes other camels that were not part of the caravan would follow as if they were attracted by the sound of the bell. Camels are easily scared. At night a hare jumping out of a bush could frighten a camel and it might break its nose peg if it jumped up. But if the bell was ringing the camels would be calmer and less easily scared.

When it was time to load the camels in the morning, the driver would get the load into position and the camel would kneel down between the sacks. Two men, one on each side, could then hoist the cargo up onto its back.

Camel caravans take place in winter because the other seasons are not good times for the camel. In the spring, camels are quite weak and their humps are drooping. At the beginning of summer they begin to lose their fur and heavy loads could hurt their skin. So the best thing to do is prepare the salt in the autumn and set off in the winter.

After the Household Contract Responsibility System was introduced, livestock and land were distributed among the people. After that the number of caravans fell and now there are only a few operated by some families that live next to the salt lakes.

At this point, Isige's eyes began to grow moist and he said: "How can the camel caravans survive when there are so few camels left?"

Ships of the Desert

Zhang Wenbin

There are around 19 million camels in the world. Fewer than 10% are Bactrian camels -- that is camels with two humps. All of China's 300,000 camels are Bactrian camels and there are local breeds in Alashan, Xinjiang, Sunid (Sunite, in central Inner Mongolia), Gansu and Qinghai.

Two-humped camels have evolved by adapting to the natural and geographical conditions of the Gobi Desert in the west and central regions of Inner Mongolia, the Gansu Corridor, the deserts of the Junggar and Tarim basins in Xinjiang and in Qinghai's Qaidam Basin. These are typical arid or semi-arid areas in China located north of latitude 36 degrees. These are all natural camel habitats.

The camel is also known as the ship of the desert. Its body structure, organ functions and behavior are especially developed to cope with the desert environment -- that is arid, windy, sandy, with rapid temperature variations and lack of vegetation and

water. Camels have been ideally suited to this kind of environment for many generations and thus they present a valuable genetic study for humans. In one way we can say the camel and desert vegetation have established a harmonious relationship and are both part of the desert ecology.

The camel's tolerance for lack of water is unmatched by any other domesticated animal. According to research conducted by He Xinmin, the commander of the Gansu Camel Corps in 1948, camels were still able to move around even after 21 days without food and water. At that stage they had lost about 15 per cent of their bodyweight. The animal also recovered very rapidly as soon as it began feeding and drinking again. In 1954, a Pakistani researcher made it across the Sahara Desert -- that's a distance of 950 kilometers -- on a single-humped camel that didn't drink any water at all during the journey. Other research conducted in 1981 by a breed experimentation centre in Ulan Tsab Aimag (League) in Inner Mongolia, found that Bactrian Camels can survive up to 63 days without food and water, and up to 110 days without food but with water. Most other domesticated animals suffer physiological problems when they lose 10 per cent of their bodyweight due to water loss. The camel suffers no ill effects until it has lost at least 30 per cent.

Inside the camel's stomach are about 300 ping-pong-ball sized bursas or water sacs. People used to think that the camel could go for days without water because it would store water in these sacs. However, research done on dead camels shows that these sacs don't actually hold much water, rather they are organs dedicated to aiding digestion. The camel's stomach is very different from other grass-eating mammals. The reticulum and omasum are not separate. The sacs help to grind up food and extract water during digestion. They have layers of interwoven grid-like muscles and look like the inside of a beehive. A camel's appendix is similar. Its grid-like structure helps digestion but it doesn't hold much water, only about 4 liters in all. It's certainly not enough to explain how the camel can survive so long without water. There are stories about how people have slaughtered camels to get at the water stored in their stomachs in vain as very little is actually stored there. Then it was believed that the humps were used to store water. However inside the hump is a mass of fatty tissue which acts as a storage of energy and nutrients. The humps weigh between 15 to 30 kilos. In the autumn they are full and stand straight up but whenever the camel is malnourished or sick they will shrink and slump to the side. They only play a small part in water storage. Every 100 grams of fat generates about 110 grams of water once it is metabolized. Thus 30 kilos of fat can, at most, produce 33 kilos of metabolic water. Since a camel requires about 10 kilos of water a day that is clearly not enough because that





A big male camel is capable of looking after and protecting his own herd of females.
Photo: S. Hasbagan

The key stage in taming a camel is putting a peg through its nose. Training normally begins at the age of three years when the camel's nose is pierced and it is taught to follow simple instructions and carry loads.
Photo: Zhou Haixiang

means the humps will be used up after three days. The humps, therefore, are used as an energy supply, not for water storage.

So where does the camel's extraordinary tolerance to thirst come from? Although modern science cannot fully explain this, there are two things about the camel that we are certain of. Firstly, since a camel can gulp down 80 kilos of water at a time, it is certainly storing the water somewhere. In fact the camel, can store water in its blood. The animal's red blood cells can double their size without bursting, a phenomenon which few other animals can match. When the camel cannot find

water to drink, the water stored in the blood cells can be released to support metabolism. The red blood cells shrink back down. Essentially, the blood system serves as a water reservoir. Secondly, the camel uses water sparingly. Its breathing rate is slow, about 10 times per minute, which cuts down on evaporation. Furthermore, the mucus membranes in its nose are capable of retrieving and recycling some moisture during exhalation. Camel urine is concentrated and they have few sweat glands – they have a different way of regulating their body temperature to many other mammals -- and that all helps to keep water inside

the body. Whereas cattle manure is about 60 per cent moisture, the camel's is just 15 per cent.

The camel has adapted well to living in a windy and sandy environment. While humans feel blinded and suffocated in a sandstorm, camels know how to seek out a good shelter and just wait it out. They can stand or lie down and aren't bothered by the storm at all. Camels know their own way home even if the rider has lost his way. The camel's body has adapted features to keep sand out: their nostrils are slanted and lined with fine hairs; their ears are short and hairy; their eyes have long eyelashes; and their anus and genitals can be closed tightly.

The camel has large soft pads on its hooves which reduce compression on its legs compared with horses, donkeys or sheep crossing similar hard ground. They are perfectly adapted to walking on sand. Although other animals may have a lighter bodyweight their hooves have a smaller surface area and so they tend to sink into the sand making it hard to walk long distances in the desert. Camels' hooves are also less damaging to desert grasses.

The camel's body is covered with dense hair which means it is capable of coping with extreme temperatures and is immune to frostbite even when the temperature drops to minus 30 ° C. I have heard that the winter flying suits for Air Force pilots are padded with camel hair. In the autumn, grass is abundant and the camel stores a large amount of fat in its abdomen, under the skin, among the muscles and especially in its humps, which can weigh up to 15 kilos each. In total, it can save up to 60 kilos of fat, that's about 5 per cent of its bodyweight. It uses this fat to generate energy which is used for regulating body temperature and meeting other needs. The camel can adjust its body temperature to deal with mid-summer temperatures of 35° C and ground temperatures of 70° C. In 1986, research at the Alashan Camel Institute found that a camel's body temperature can vary by 3.5 ° C a day, something unimaginable for humans. If you watch a camel under the blistering sun you will notice that it always keeps its key body parts far away from the ground, only its four legs or its chest –which is covered by hardened skin -- will touch the ground. It keeps its lower belly tucked up and its head held high away from the burning sand.

Camels are very easy to keep because they can eat a wide range of vegetation. As well as grasses, they can eat plants that other livestock won't touch, such as shrubs, small bushes, prickly plants and plants with high saline-alkali content. Camels are good walkers and versatile eaters – their lips are nimble and can pick grass and leaves wherever they grow – and camels can tolerate drought.

(The author is Director of the Alashan Camel Institute in Inner Mongolia)

Changes in Heaven

Piao Hanzhen

The word Tengri in Mongolian means ‘heaven’ and it implies the image of an endless desert, vast like a sky. It is China’s fourth largest desert with a total area of 42,000 square kilometers. It is dotted with sand dunes and covered with lake basins, mountains, hills and plains. Artesian water has been found in numerous locations and there are 422 lakes, more than any other desert in China. The land around these lakes has traditionally been used for grazing animals because there is plenty of water and grass. However, these characteristics of the Tengri Desert have been on the decline since the early 1990’s.

Lakes in the Tengri Desert are mostly oblong shaped and salty. The best known lakes are Toudao (first) Lake, Erdao (second) Lake and Sandao (third) Lake. Around a lake basin, migratory dunes are found on the outer edge whilst stationary or semi-stationary dunes covered by plants like nitraria, reeds and desert bamboo (*psammochloa mongolica*) can be found closer to the shore. Between these dunes and the lake water is marsh and grassland. Photo: Hong Xing



Half a century ago large numbers of people from Gansu Province sought refuge here from famine. But now this place has had to resettle much of its population for environmental reasons. How did something like this happen?

We have arrived on the last leg of our desert journey. We are in the Tengri Desert. It is a vast place and its name means 'heaven' in Mongolian. The sight of prosperity here is refreshing after our journey through the desolate Gobi and Badain Jaran with their endless sand dunes. Along either side of the highway stretch large expanses of greenness; you can see grasslands, lakes, herds of livestock, factories and villages. There are some low and undulating sand dunes on the horizon.

We stopped at the first lake we saw. The hilly ground next to the highway was covered with dark green nitraria (*Nitraria sibirica*) plants and seven or eight camels were nibbling on them leisurely. On a lower slope, a lot of *Kalidium foliatum* plants could be seen, and they were lush and green. Further down, the ground turned into salty marshland with dense grass stretching all the way to the lakeside, spotted with small whitish salty patches. The narrow lake was not large and reeds about 10 centimeters high were growing at its edge, fluttering gently in the breeze. Unimongke, Party Secretary of the Animal Husbandry Bureau in the Banner told me that these plants were typical Tengri plants. Around these lakes people have built settlements, fodder-processing mills and established grazing lands.



In the Tengri Desert, there are pockets where the water table is higher and where you can often find areas filled with grasses, bushes and even trees. While this means the Tengri is a good area for development, it is very vulnerable and vegetation degeneration and desertification have also begun to happen . Photo: Zhou Haixiang

He also said that the Tengri is known for its many fresh water lakes and oases. There are over 400 lakes in its 42,000 square kilometers, that's more than any other desert in China. "There is water everywhere in the Tengri and the underground water level is comparatively high. When I was small, if you felt thirsty in the desert then all you had to do was dig a hole about as deep as your forearm. We would use a handkerchief to ball up some sand, dip it in the water and then drink the drips." In the old days there were many salt and saltpeter mines by the salt lakes. They used to truck all the minerals to Zhongwei in exchange for grain.

Because it has many water resources, the Tengri has always been a grazing land and one of China's deserts with the best conditions for development. Even so, the Tengri's prosperity is vulnerable and any slight, unsuited disturbance could destroy it.

Sand Dunes Swamped in Reeds

We finally arrived at Temee uul ghacaa after traveling past countless low sand dunes covered with nitraria plants. This place is home to one of seven famous wells and is near Tonghu Mountain

and a camel-shaped hill. We pulled over in front of Rincinnorbu's house. He is a local herder. He has a very traditional house with a courtyard and a cattle dung wall. We exchanged greetings and told him that we wanted to learn about the recent changes to this area. He sat us down for a while and then the 78-year-old man asked us to follow him. He was going to show us something.

Walking around the cattle dung wall in front of his courtyard, we saw rows of rolling dunes. Clusters of nitraria plants contrasted sharply with the golden sand. Nitraria was the most common plant we had seen since entering the Tengri Desert. Although the plant made the scenery look green and healthy, Unimongke told us it was actually a sign that the environment is being degraded. Cattle and sheep seldom feed on nitraria. Only camels will eat it and then only when there is nothing else to feed on.

The old man told us that in the old days it wasn't like this. "In my teens, the land was very good. There were lots of reeds and sand bamboo (*Psammochloa villosa*). The grass turned the landscape into a white expanse. The reeds growing on the sand dune slopes would reach almost to the top, dense and high, tall



Rincinnorbu is the first herdsman we interviewed in the Tengri. He is telling us about the changes that have happened to the Gobi over the past few decades. Photo: Han Ying



This used to be an area thick with reeds. Now, because of the lowering of the water table, just a few withered stalks are left. Photo: Chen Yang

as my house. The reeds were so thick that the camels would disappear once they walked into the middle of them. Nitraria would grow on the edges of lakes and around people's homes. But now they grow everywhere and the reeds and sand bamboo have disappeared.

"The reeds of my memory were thick and lush. How was it that they grew so thick and tall that they would hide the camels?" Once we got to the top of the next sand dune, the old man stopped and said, "Look, here we are." We looked down and there stood dense reed stalks of various lengths on a broad stretch of lowland between two sand ranges. They looked like they were growing to almost the top of both hills. Curious, we rushed down to take a closer look. But what we had seen were old dead dried reeds with their knobby roots and stalks still showing. The old man had wanted us to see that the reeds that once grew here had all died.

Oyungerel, his eldest daughter, told me that this land used to produce 200 tonnes of reeds a year for the use of three Production Brigades. In late August and early September, people used to come here to collect huge piles of reeds on camel back because there was no way to drive a truck in here. When the

people and camels walked into the reed forests they would disappear from sight. They used to camp here overnight and it was very busy. However, about a dozen years ago the reeds had virtually all died out and all that was left were the dried stalks and roots. The father and daughter both suggested that the reeds died out because of less rainfall.

"In the old days during the rainy season, flood waters would carry layers and layers of sediment across the desert, sometimes two or three times a year. The water would slowly seep down into the ground and at the same time meter-deep pools would also form. When the rain was especially heavy and the water couldn't completely seep down in the winter it would turn to ice pools. At that time, the water table was high and in some places, water would rise to the surface. Nowadays you never see such things," said the old man. Oyungerel agreed. "There was always water just below the surface in the old days. Take this reedy spot for example. You just needed to dig a little and you would reach the water table."

The sight of all these dead and dried reeds spoke of a past that had plenty of water and good harvests. How far below the surface was the water table now? We tested it by digging with a spade. After about 20 centimeters we reached damp sand, but even when we dug as far as one meter we had still not reached water. The old man shook his head. "I am afraid no water can be found here. Perhaps you should try at another spot. In the old days it would have been easy to dig for water." So we picked another spot 30 or 40 meters away and began digging again. This time water began to ooze up slowly as we reached 1.5 meters. The old man said that the water level in his well had dropped by more than a meter in the past few years.

With less water available, many plants have stopped growing. As well as the reeds and grasses favored by livestock, sand bamboo, *Achnatherum splendens*, sand sagebrush (*Artemisia filifolia*) and sweetvetch (*Hedysarum scoparium*) are also dying out. The old man shook his head. "It is so strange. There is so much more nitraria, and it's also growing in the marshland too. The camels didn't use to eat nitraria but now they do because there is not so much to feed on. Our livestock are growing smaller too.

"There is more sand around now since the grass has stopped growing. In the old days sand sagebrush covered much of the marshland and you could hardly see the sand. But now the sand is found in lumps and knots. My old house is completely buried in sand. The sand dune that used to be behind my house has grown over 100 meters. It now stretches to the front of my house.

"Winds are much stronger these days and they are more common. In the past it was only windy in the spring but now it is windy all year round. In the old



Because of massive evaporation, many lake basins develop a flat plain high in salt (sebkha) like this one. Salt grass (salicornia) can still grow on the thick layer of salt deposits and only camels can feed on it. In autumn the grass becomes red, turning the plain into a vast “red carpet.” Photo: Zhou Haixiang

days you would get patches of snow that would just stay there in a hollow for a month or so. Now you hardly see snow fall let alone settle on the ground. There used to be lots of birds such as gray cranes, white cranes and egrets, and animals such as hogs, badgers, hedgehogs, Mongolian gazelles and wolves. But now we hardly ever see them.”

While he was talking about the past, the old man seemed saddened and puzzled by all the changes that had taken place. His family is not the only one bothered by this. All the families we visited in the past few days told us about their helplessness in the face of the changes that have happened to their land.

Oyungerel lives in Cuu sumu (Town) on the other side of the Tengri. Her house was on a patch of sandy ground. There were a couple of scattered nitraria bushes growing in front of her house and through her windows you could see rolling sand dunes heading off into the boundless desert just like a frozen ocean. We asked her about the changes that had taken place in recent years and she wasted no time in answering us.

but now we get them all year round. It kills the melons and ruins the vegetables and so we have no harvest for that year. We also have less and less water. What is happening?”

How come the once flourishing Tengri is so vulnerable and why has it changed so dramatically in a few short decades?

A Haven for Refugees

As we drove deeper into the desert, we started to see the occasional mountain. This is typical Tengri terrain and not something you see in the Badain Jaran, Ulan Buhor the other deserts we had just been to. We noticed how the sand would change color from place to place because it was tinged with hues of the bedrock beneath. Han Tonglin, a professor of geology who was traveling with us, said the changing colors showed that the Tengri Desert was probably created by the erosion of stones. As its geological age is not very old, the desert is still growing and that is why it is unstable. From this perspective, it is understandable that it has been able to change so drastically in such a short space of time.

In the past, reeds and *Achnatherum splendens* would grow so thickly that camels could hide inside them and people could harvest tens of thousands of kilos of reeds. Local people say that they are so few reeds left now that you can't even make a brush out of them.

“There were lots of reeds growing on the sand around here in the old days and the Production Brigade would come here and harvest them. In the early 1980's, they used to collect about 1,800 bundles of reeds from a small lake near here but now you couldn't collect enough reeds to make a brush. *Achnatherum* used to grow on the roadside and we used to make it into bundles of hay. It grew so high that a man with his cattle would be totally hidden once inside. Now it's all gone and even the grasses have disappeared. It is so dry now and the grass is covered by a dust that gives the sheep bouts of diarrhea and makes them lose weight. Some sheep even end up dying. As the snow on the ground is much thinner than before, when the camels eat the grass, they pick up the sand with the grass and it could kill them too. It was not like this before. The wind is now much stronger, many times stronger than before. It blows the sand faster than a man can run. There is more salt too. When it's windy, the salty dust turns the corn white and burns the rims of the leaves brown. The dust is stifling and it irritates our eyes, throat and skin. The goats also start sneezing and get sick. In the old days maybe you would get two or three salty dust storms and just mainly in the spring,

We drove off the highway and just after dusk we arrived at Bayan huree ghacaa (village). We had spent the better half of the day driving past nitraria-covered sand dunes and salted fields. In the light of a dim bulb light, the wife of the Ghacaa Head served us hot water and a big pile of steamed pancakes. We were surprised as over the past 20 days in Alashan all we had been served was milk tea and fried dough in every home we visited. It turned out that this family was ethnic Han who had migrated from Minqin in Gansu province, many years ago. These steamed pancakes were actually one of the big signs of the drastic changes that had taken place in the Tengri.

Since the Tengri borders Minqin, large numbers of people from Gansu migrated here during the Republican era (1911-1949). The Tengri was attractive because it had higher living standards and there were less people. Because of the loose migration controls then, many people in Gansu fled from famine and arrived here in the early 1960's. Li Jianxin, the Ghacaa head, had migrated here from Minqin with his parents in 1958. He told us: “The people from Minqin started coming here long ago and many others have followed. One third of the people in this Ghacaa came from

Minqin after 1958. Many of them came to join their relatives and friends who had already settled here. Between 1960 and 1963 there was a disaster in Gansu and there was a flood of people from Minqin coming here. Now the ratio of Han people to Mongolian people is about 50:50.” His wife is also from Minqin but had migrated here later than him.

Looking out at the nitraria-covered land and the endless golden sands stretching towards the horizon, I wanted to know what the Tengri meant for these migrants from Minqin. Li Jianxin suggested that we talk to an old couple who lived nearby. They also came from Minqin and they could tell us more about the old days. So we set off to find this old couple.

As we walked into their house we noticed that their ordinary little courtyard had a cornice over the gate which gave it the look of a farmhouse in central China. The old couple greeted us and invited us in. We were served steamed pancakes and buns in the typical Minqin style. Wang Weilu was 73 years old. He came

the way. We picked *Kalidium* seeds when we found them on the way and would bake them in a wok which we had to borrow from a local. After baking them we ground it into a flour. We also ate the herb *suoyang* (*Cynomorium*). You remove the outer layer and then boil it, grind it and then mix it with the flour from the *Kalidium* seeds. In the night-time we would just sleep out in the open, on the ground. First we would heat a little sand and then spread it on the ground and sleep in our fur-lined jackets. At that time our son was not even one year-old. We had to beg food for him. So many people died of hunger along the way. Some of them would fall asleep on the ground and never wake up again. We saw this with our own eyes. One time, a group of people went off to fetch water from a well, leaving their friends behind to wait. But both groups died. If you made it into Inner Mongolia you had a chance at surviving. The people here were so kind. They gave us food and let us sleep in their yurts at night. When we arrived at this ghacaa in 1962, we began by cutting grass and doing odd jobs, whatever

In the early 1960's, because of natural disasters, 16,000 to 25,000 refugees fled to Alashan juun hoshuu. Most of these later settled in Tengri. Calgar's population jumped from 100 to over 300 people.

here in 1958. He told us: “I left Minqin because there wasn't any more food to eat. Lots of people left at that time. Before 1958 there were about 240,000 people living there, but after that year only 180,000 were left. I headed first to Alashan juun hoshuu (Left Banner) and worked at the mine there for a couple of years. But there were too many people in the mine and we didn't have enough food rations so I joined my parents here in 1962. They had been working for some years helping some local families look after their livestock and so I also learnt how to herd animals. Life here is many times better than it was in Minqin. And although many years have passed since we left our village, we still make our traditional steamed buns. But we also eat boiled mutton like the locals. This place has saved a lot of Minqin people's lives.” His account was brief and it seems that the old days of hardship have slowly faded from his memory. His wife, Wang Meiying, was more forthcoming, however, and she gave this emotional account of the past.

“When we left Minqin all those years ago we carried our eldest son on our backs. We walked bare foot all the way into Inner Mongolia. It took more than 20 days and it was December. We begged for food along

came our way. We were given work points and our lives started to improve right away. Everyone was given 14 kilos of rationed grain. If you had a job you got 15 kilos. We were also given sheep and so we could eat meat.”

The people of the Tengri opened their arms to the refugees from Minqin. There was plenty of land, water and food. In fact, the people of the Tengri took in more Minqin refugees than anywhere else in Alashan. Between 1960 and 1963, 16,000 to 25,000 people from Minqin migrated to the Alashan juun hoshuu (Left Banner) with the majority ending up in the Tengri. As Naren Madula, former head of Tengri Sumu (township), remembered, the population of Calgar Ghacaa, where he lived, jumped from 100 to 300. Because of this, the Tengri, which used to have hardly any people, experienced a sharp rise in population.

The primary concern for all these migrants was survival. Some of them worked in the mines, some did odd jobs, while others went and looked after animals. Historically speaking, the people of Minqin have more in common with the people from Xinjiang because they are used to arable farming, not following herds. But at the time, when they were faced with death, they



Wang Weilu (second from left) migrated with his family from Minqin many decades ago and settled in the Tengri. When they fled from Minqin, they carried their eldest son (first from left), on their backs. At that time he was not even one year's old. Now he is a married man. Photo: Han Ying

didn't deliberate over the choice to go to Inner Mongolia. Wang Weilu said: "In Minqin we were farmers and when we came here we had to learn how to look after livestock. We also had to learn how to judge how good the land was for the animals. It took about six months to a year. Because we are all poor people we didn't mind what work it was. We were prepared to learn anything as long as we could make a living." His wife nodded in agreement. "We didn't mind whatever hardship was thrown at us as long as we knew we could survive. No matter how hard it gets here it is always better than Minqin. In 1977, we were given a flock of sheep because of our good conduct."

Li Jianxin's wife then said: "When we were first learning to take care of the camels, we didn't dare to ride them as we had never done that before. We couldn't even tell which camels were ours and so we tied pieces of string to their necks so we could recognize them. After about two years, we had learnt how to tell the camels apart and we knew quite a bit about their habits. Now we are happy to look after them. Learning to look after animals is not that difficult. If it was, then we would never be in such a good situation as we are now."

It didn't take the people from Minqin long to adapt and mix with the locals. But they still brought along some local farming knowledge. Wang Weilu said the Han migrants dug wells, built houses and started vegetable gardens when they first got here. The local Mongolians then learnt these skills from the Han. However, digging wells and building houses and animal sheds requires a lot of skill and you also need a lot of wood. All the old people remember that a lot of the shrubs were cut down at that time. The Mongolians wouldn't chop down the wood but would only pick up broken branches. This tradition of not felling trees and shrubs helped to protect the local environment. However, when all these Han people came in the early 60's they broke that taboo. Now Mongolians like Rincinnorbu

are experts at building houses today. He told us that stem of sweetvetch can be used to make houses and animal shelters. He told us he just constructs a frame and then covers it up with mud. But he needs to cut the wood to make the frame because dry fallen branches are too brittle for the job.

Farming technologies and practices that the Han migrants introduced to this area have had a huge impact on the local ecology. Before 1949, there were just a few migrants from Minqin who had started trying to convert the desert land near lakes into farmland. After 1960, large numbers of migrants came here and many of them tried to establish new farming plots. Back in 1949, there was about 333 hectares of farmland in Alashan juun hoshuu (Left Banner) but by 1960 that area had shot up to 6,000 hectares. In the mid-1960's, when Mao Zedong's "Learn from Dazhai in Agriculture" campaign was launched (it urged peasants to work hard and boost local agriculture), the local Han migrants worked even harder at expanding their farms. At the time there was a slogan: "Nomads should produce their own grain." After that, several

The Han migrants, though, are skilled farmers. Li Jianxin's vegetable garden was flourishing with tomatoes and peppercorns. His corn field was filled with waving, enticing golden corn cobs. We had never imagined that crops like this could be grown in the desert.

The new migrants from Minqin were very hard working and they were prepared to put up with much hardship. It did not take long before they had settled into their new life in Inner Mongolia. During the collective period, most of the ghacaa heads and party secretaries were also of Han ethnicity. Both Wang Weilu and Li Jianxin had been ghacaa heads for over 10 years. Oyungerel from Chaosumu said: "Our ghacaa head is also from Minqin. In fact about 80% or 90% of ghacaa heads are from Minqin. They are better home makers than us Mongolians, in every respect." Because of this, ways of life and ways of work gradually changed in the Tengri, from the local traditions to the ideas and practices of the Han migrants.

Liu Shurun, the ecologist who was traveling with us, said that the Tengri may look prosperous but it is a very

When the 'Household Contract Responsibility System' was adopted everyone went into livestock grazing. The number of herds at Bayan huree ghacaa shot up from less than 30 to over 100.

fodder-processing mills were built around lakes in the Tengri and they largely employed people from Minqin. In the 1980's, when the land was distributed, many of the farmlands that had belonged to the Production Brigades were abandoned and families with animals set up fields – roughly 0.67 hectares in area -- for their animals instead around the lake.

Li Jianxin told us: "There are more people digging wells and farming these days. In my ghacaa alone, since 1985 around 40 wells have been built with plastic pipes and about 13 to 20 hectares of land has been converted into farmland. There are about 20 families living here, including Mongolians, and each one has about 0.4 or 0.5 hectares of land for growing fodder. It's just enough to feed their goats." One obvious consequence of the explosion in farmed land is the decline of the water table. According to him many ponds have dried up. In the past, you only needed to dig about 30 centimeters to reach water but now you may need to scrape below one meter. The ghacaa used to have six ponds but now it has only one. With less underground water, there are fewer grasses like *Achnatherum splendens*, *nitraria*, sweetvetch and Mongolian Calligonum (*Calligonum mongolicum*).

vulnerable environment. Both the local vegetation and the water levels are very sensitive to outside changes and it is very easy to upset the balance. The influx of such large numbers of migrants placed a big strain on the local ecology.

After Land Distribution

Population growth and the rapid cultural shift exerted many pressures on the Tengri, but animal husbandry reform in the region in the 1980's also brought about some fundamental changes.

We asked Rincinnorbu about the grazing situation and the old man told us that in the old days, people and animals would live close to wells. In the 1950's, there used to be a large well on his land that was shared between three families and altogether there were 500 goats, 50 cattle, 30 horses and about 100 camels sharing it. At that time people still practiced the nomadic way of life and the locals divided their land into winter, spring and summer grazing lands. All the animals in the neighborhood would come and drink at the well. People would move around with the animals and live in yurts. No one lived directly at the well, everyone would carry water on the backs of pack animals. The people and animals would just follow the grass. If they



A moon-shaped lake in the Tengri. Photo: Hong Xing

Suoyang (cynomorium) is a herb which grows on the roots of the nitraria plant. It is edible and has medicinal properties. It saved a lot of refugees' lives when they were fleeing natural disasters in Gansu. Photo: Han Ying



stayed in the same place then it would put too much pressure in one spot and land far away wouldn't get used. The old man continued: "During collectivization, there were lots of old people and young children and it was very hard work to collect enough water for all of them. So I built a house next to the well where they could live while the rest of the family followed the animals. At that time we called the well, 'the old people's home.'

"The nomadic lifestyle allowed time for the land to recover and it was continued even under collectivization although by that time the population of this area had grown. We didn't add any more grazing stations because the land wouldn't have been able to support it. The surplus laborers were organized to carry out sideline production, such as making hay, driving camel caravans, tilling the land, building sheep pens, digging wells and working on construction projects. In 1983, after the adoption of the 'Household Contract Responsibility System,' the land and animals were allocated to individual households and that meant that

suddenly there were a lot of more animals on a smaller space of land. The number of livestock rose rapidly. Now, living around my well are 15 households and together they own 200 camels, 1,500 goats and about a dozen cattle. On top of that, each family now only grazes their animals on one small plot of land and that damages the plants."

We heard a similar story from Li Jianxin. He told us that during the collective period the Production Brigade assigned jobs to the villagers. The surplus laborers were arranged to work in sideline production, building livestock sheds and some entered military service. After the land and livestock were allocated in 1983, married children all had their own share. If you were not married your share went to your father. Hu Manghai, Li's former ghacaa head, told us that after 1983 the number of livestock herds shot up to more than 100 from less than 30 before. There were many more animals than before and every household could decide what and how many livestock it wanted to take care of.

At this point, Li Jianxin's wife interrupted us. "My father was the Brigade's designated felt-maker and supported my family with his skills." By the time of land distribution she was already married and so she got her share of land and livestock. "My family of five was given 12 camels. Now the herd has grown to 90."

Before the "Household Contract Responsibility System," the negative impact on the environment from population growth and cultural changes was still manageable and that's because everyone was assigned work in accordance with what the land could support. After the "Household Contract Responsibility System" was introduced there were too many animals in too small an area and there was not enough space for them to move around. So many more people were involved in animal husbandry and it was very hard to control the number of livestock anymore.

The Tengri was once a prosperous region and but it is unable to bear the pressure any longer. Underground water levels are dropping and the land is degrading. Because it cannot support such large numbers of livestock, animals have begun dying from starvation. Others are sold off and locals' lives are getting increasingly hard. Li Jianxin said: "The pastures have suffered badly. My ghacaa used to be home to 1,200 camels during the collective period but there are only about 400 now." Wang Weilu added: "My family of 10 got 1,000 hectares of land, 30 camels and 70 goats when the land and animals were distributed. In 1989 and 1990, my herds grew to a peak of 50 camels and 200 goats but after that the grass started to suffer and 10 of my camels died. Once the grass dies, the sand comes."

Since 1994, the government has been encouraging the locals to move away and live in a new settlement called Hoyar hudug (Migrants Village) on the edge

of the Tengri. They are being urged to stop herding animals and instead turn their hand at vegetable farming. When he was the Party Secretary of the Production Brigade, Wang Weilu's biggest job was to persuade the locals to move away. To date, there are still 100 families in the Sumu (Township) that haven't yet moved but it is planned to relocate almost all of them in the end.

The Tengri has supported generations upon generations of Mongolian nomads and has generously

accepted many new migrants from outside Inner Mongolia. However, the Tengri's rich gifts have pre-disposed it with a vulnerability and it may well vanish unless people start protecting it. In the end, local people have been forced to move away because this part of the Tengri can no longer support them.

We have just been in the Tengri for a few short days but our investigation has taken us from the time when refugees flooded in to now when people are being sent out.

Background		Narrative: Rincinnorbu
<p>[Plants] We used to grind and bake the seeds from the Kalidium and 'sand rice' (Agriophyllum squarrosum) plants and use them to make a flour. Nowadays you can get a lot of different kinds of grain and so hardly anyone does this anymore. Fried doughnuts can be made from sand rice flour but you can't use it to make noodles because it's not sticky enough. In the old days everyone used to eat it and so every home had a millstone. In good years, we could make five or six sacks of flour from the sand rice. We would make the sacks from camel hair and each one could hold 50 kilos. The weather is much dryer now so our harvests are not as good.</p> <p>We used to eat a lot of 'sand rice' and also desert green onions (Allium mongolicum). You can use 'desert mustard' (Pugionium cornutum) to make pickles. The herb we call suoyang (Cynomorium songaricum) is also edible and is good for making steamed buns. It is quite sweet and can be used to cure stomach trouble. The red berries of the nitraria plant soaked in dew are also good for curing stomach problems. I also heard that you can use them to make wine. When an animal falls ill from the summer heat, you can dig up licorice (Glycyrrhiza) and make the root into a tea which will cure them. The root of the 'bitter bean' (Sophora alopecuroides) can also be made into a herbal tea cure for heatstroke for the livestock. The sand rice also has</p>	<p>medicinal properties. When a camel catches a cough or is too weak to stand up, you can feed it unbaked flour mixed with water. sweetvetch (Hedysarum scoparium) seeds are also edible and they are sweet. Tea made from the root of the Achnatherum splendens plant is a good diuretic.</p> <p>[Water] When I was young I used to follow the animals far from home. If I was tired and hot I could just lie in a wet patch of sand or if I was thirsty I could dig a hole in the sand and drink the water that came out. I would drink it by dipping a towel into the hole.</p> <p>We normally don't wash our clothes at home, we rub them clean in the sand. Once the livestock have drunk from the well we drive them away as we don't want them to urinate near the well. The water we use to wash dishes is given to the animals to drink because it is nutritious.</p> <p>[Sand] If you put a sweet potato-sized piece of dough in a patch of hot sand and wait for an hour it will be cooked. We often used to cook like that when we were driving a camel caravan or migrating to a new pasture. You can also make qiedan (small dough balls) like this. You can heat up the sand by burning camel dung. Once the sand has cooled, you know the dough is cooked and you can easily brush off the sand.</p> <p>Cold rain can kill exhausted livestock, especially newly-sheared sheep. If you see a sheep trembling</p>	<p>on the ground from the cold, you can save it by burying it in the sand and just leave its head exposed. If you bring it indoors at this time it may die, but in the sand it will live. One year, I had just sheared 20 of my sheep and there was a sudden hailstorm, so I buried them all in the sand and then dug them out once the storm was over. They all survived. If you want to sleep out in the desert in the summertime you can just bury your body in the sand with your head poking out. That way you can stay warm.</p> <p>The Muslims would come here in the winter to dig up hair-fungus (Nostoc flagelliforme). They would make a fire on top of the sand and then pour cold sand over it to make a "hotbed" for the night. We also do the same when we can't find a place to sleep when we are away from home. For a child that wets the bed, all you have to do is put a sack of sand on its bottom. It is our "pampers" and a fresh one is put on when the old one gets wet.</p> <p>An old man with rheumatism and leg cramps was once cured after sleeping on a kang (heated earthen bed) with hot sand on top for three years. Burying yourself in the sand in June can help you if you suffer from rheumatism.</p> <p>The camel is ideally suited to life in the desert. Its hooves aren't worn down by the sand, but they feel pain when they have to walk on concrete or hard rock. Maybe that's another benefit of sand.</p>

Into the Heart of Alashan's Gobi

Xiaomei

The Gobi has been described as “a place that is hard for grass and trees to grow,” and also, “an uninhabitable place for people.” Despite this, the Gobi, which makes up one third of Alashan, has been the home for people, animals and plants for millennia. Around one per cent of its land surface is covered by arid plants (super xerophil). The Gobi is also home to camels, known as the “ships of the desert,” and scattered settlements of people living tens or even one hundred kilometers apart from each other and tending land tens of hundreds of hectares in area. It is a world of austerity and also of miracles. People here possess precious knowledge on how to live in an arid terrain.



The different shapes and colors of the stones bring relief after the monotonous and barren Gobi landscape. Scientists say that the different colors are made by the various rocks that have eroded to form the sand. Photo: Zhou Haixiang



Adiya is a local Mongolian woman who lives in Uudur modu ghacaa Oljii balgas (town), Alashan. Here she is telling us about her life. Photo: Han Ying

Our all-terrain vehicles set off from Bayanhot town and headed to the north to the foot of the Helan Mountains. Along the way, desert shrubs became increasingly scarcer and the ground became more and more stony. Facing into the wind, I noticed tiny sand hills forming and fanning out from each of the bushes. Their golden color contrasted sharply with the dark stones. The scientists traveling with us told us we had now entered the Gobi.

“What is the Gobi?”

The simple answer, according to the scientists, is that the Gobi is a barren land lacking water and soil. It has a stony terrain with little vegetation. The word gobi in Mongolian means a place where it is hard for grass and trees to grow.

The austerity of the Gobi is beyond one’s imagination. From a distance, the dark mountains look like huge rocks with layers of shale. As you get closer, you see that the ground is covered with stones of all sizes. The stones are all different colors -- gray, black, yellow, red and brown – and they brighten up the monotonous landscape. By noon, the scorching sun has raised surface temperatures to a sizzling 40 to 50 degrees Celsius. The scarred and mottled trunks of several old elms growing in a dry riverbed looked like they had been carved by a cruel sculptor.

It is easy to feel isolated in the Gobi. There is little green vegetation and you may drive for hours before you come across anyone. Only low-growing shrubs like reumuria (*Reumuria soongorica*), nitraria (*Nitraria*

sphaerocarpa) and what the locals call Zhenzhu ‘pearls’ (*Salsola passerina*) grow scattered here and there. Zhenzhu is a strange plant with grayish leaves and a root system that is exposed high above the ground. It stands stubbornly in the sand, looking like a sculpture. Some of them emerge through cracks in the rocks, a sign of struggling life in this wide expanse of barrenness.

The sight of a herd of camels in the distance got the whole team quite excited. The herd represented the resilience of life here and suggested that people may be living nearby.

We had thought the Gobi was uninhabitable. The scientists told us that the part of the Gobi that was in Xinjiang had virtually no people or livestock. But here, in Alashan, the Gobi is blessed with human life and camels. What can a camel find to eat in this stony landscape where there is hardly any grass? What does it drink when there may be no water for tens of kilometers? Why does the camel choose to live in this harsh environment? How do they adapt? What is their life like? With all these questions in our heads we set off to visit the people living in the Gobi.

“Although it grows sparsely, the grass and shrub in

the Gobi is nourishing. Camels are healthier here than anywhere else. They put on weight and develop good stamina and they are tall and strong. They know what’s good in the Gobi and even when they leave the desert they always come back.”

We paid a visit to Cerenghorlo, who lives in Undur modu ghacaa (Mongolian village) in Oljii balgas (Mongolian town), Alashan juun hoshuu (Left Banner), near the border between China and Mongolia. It was the evening of September 6. There was nowhere else to sleep for another 100 kilometers.

As we entered the courtyard, we spotted pails, plastic tanks and rubber containers for storing water in a corner – essential for a house in the heart of the Gobi. Over the past few days we had experienced for ourselves how dry the Gobi was. Every household has to fetch its own water, often from a faraway source. It was no wonder then that the old lady in the house was reluctant to give us some hot water when we asked her for some so we could eat our instant noodles. We suddenly realized that our group of around a dozen people could easily exhaust her family’s water supply for two weeks. Water is the key issue for anyone spending a night here. So before we got ready for the



Ridges and hills in the Gobi are called ‘positive landforms’ and lower regions are called ‘negative landforms.’ Sand on ‘positive landforms’ is swept away by the wind, leaving only bare rocks behind. Photo: Chen Yang

night, we sent our driver and photographer to fetch some water from the nearest source which was about a dozen kilometers away.

After dinner, naturally, we interviewed the hostess, who was 59 years old, and her two daughters. Cerenghorlo told us: “We have a well in the front of the house but the water is salty. Only the camels can drink it. Over the past few years the water level has dropped too. In the past, it was no problem for 300 camels to come here and drink but now it can hardly satisfy 300 goats and a dozen camels. We use the water for cooking rice, but not for making noodles or tea. Water has to be fetched by a pickup-truck from a place 10 kilometers away. We fetch it once every two weeks and store it in the rubber containers in the courtyard.”

We all wanted to ask why she hadn’t built her house closer to the well. So I asked her.

“The few wells that there are in the Gobi are shared by several households. If we all lived next to it, there would be too many camels in one place and it might be on someone’s land. Camels can drink any kind of water, even if it’s salty and bitter. In the summer, they get enough water from the plants so they might go for weeks without drinking. In the winter they drink once every few days. A camel can eat up to 50 kilos of fresh vegetation a day but they need to walk a long way to find this amount of food, sometimes 30 to 50 kilometers a day. But you don’t have to worry about them not coming back. A camel always comes back when he is thirsty. If you have a well or a pond then your camels will always return.”

The people here take the camels’ needs into account when they are deciding where to live. So that there won’t be too many camels in one place, they choose to live far from a water source and go and collect it once

every two weeks. This gives the camels some space and means that the land is not over-used.

“How many hectare of rangeland do you use?”

Cerenghorlo wasn’t sure exactly how much land she had. She thought for a while and then said: “Our land is about 15 kilometers from east to west and 23 kilometers north to south.”

At first we couldn’t believe it. Her pasture was about 33,333 hectares!

We got similar answers from other people we interviewed in the Gobi. But this is nothing strange when you consider how vast the Gobi is. Most families use land that is thousands or tens of thousands hectare

in area.

Grazing lands in the Gobi are very different to the grasslands elsewhere in China because in the Gobi there is only scattered vegetation. At first we wondered if the land had been damaged by something. But according to Professor Liu Shurun, who is an ecologist, there had been no degradation, this was the Gobi’s natural state.

We asked Cerenghorlo if this was the case. She replied: “Yes, it is like this all the time. In the Gobi, bushy plants such as the one we call ‘Zhumaocai’ (*Salsola collinal*) only grows when there has been some rain. It is green in the summer and then it turns brown

in the autumn. Camels like to eat their leaves. We once had about 130 camels but we suffered several wolf attacks and droughts. A couple of years ago we sold off most of our camels and now we only have about a dozen left. We can get more money from keeping cashmere goats. We have about 300 goats now. But this year is very dry and we don’t have much to feed the goats, the plants left are only good for the camels. The goats don’t have enough to eat in the winter and spring and so we have to buy fodder for them to eat. So now it’s less profitable to keep the goats than the camels. In the winter and spring, the camels can feed on the bushes and so they are cheaper to keep. So I am

On the windward side of every bush in the Gobi there is a trail of sand, looking like a golden tail stretching out. The sand offers hope to life in this stony terrain. Photo: Zhou Haixiang



starting to think of maybe replacing the cashmere goats and going back to keeping camels.

“Our camels come back by themselves from Minqin [in Gansu Province] but camels from there will stay once they come here. During the bad droughts of the 1960’s, all the livestock that went to Urad hoit hoshuu (Mongolian town) in Bayanuur aimag [League, now Bayanuur City] all survived but those that went to Minqin died in large numbers. Although Minqin has the same kinds of plants as here and they grow taller, they are less nutritious. The plants that grow in our part of the Gobi are more nutritious. In 1985 it was so dry that we had to leave here and we lost a lot of money. We went to Bayan Uul in September where the vegetation was good. Although the camels got enough to eat and their humps all filled out again, the plants were not very nourishing. By the time we returned in the following June, about 60 of our 100 camels had died. My neighbor, Adiya, didn’t go and none of her

camels died.

“The quality of the grass in the Gobi is exactly what the camels need. Although plants like reumuria and nitraria look very scrappy and they don’t grow in large numbers so, the camels have to keep on the move to eat enough, they are very nutritious. The camels put on weight when they eat them. The Gobi camels can store more fat and have more endurance than other animals. They are tall, strong and broad-shouldered, unlike those growing up in the desert [where there is no vegetation only sand].” Adiya, the neighbor, agreed.

We were surprised. The people here looked at the land in the Gobi very differently from us. Why do they think that the plants that grow here are so good? We posed this question to Zhu Zongyuan, a botanist who had been researching the plants in Alashan for many years.

“Vegetation in the Gobi has a high content of dry matter and protein. For example you need one to two

Vessels for storing and hauling water like these vats and bottles are indispensable items for anyone living in the Gobi and they are the first things to catch a visitor’s eye. Photo: Zhi Feng



Modern amenities have made their way into Mongolian nomads’ homes deep in the Gobi. This is Ceren Haorile’s home where we spent the night. Photo: Xia Shu



kilos, or maybe even 2.5 kilos of grass from grasslands or marshlands to make half a kilo of hay because of their high water content. But you only need 750 grams of plants from the Gobi to make the same amount of dry feed. The protein content of plants from the Gobi is more than 10 per cent higher than even the best grass on the grasslands. That’s why animals living in the Gobi don’t need to eat so much because of the high protein content. Desert animals cannot put on weight outside the desert even though there is lots of grass because it doesn’t have enough protein. Sometimes the grass may give them diarrhea.” Mr. Zhu’s explanation was authoritative. Although the people in the desert don’t know how to explain it in scientific terms they just know the plants in the Gobi are better for the camels.

Cerenghorlo now lives with her two daughters after her husband passed away a few years ago.

We asked her if she felt lonely with no one else around for tens of kilometers.

“My closest neighbor is Adiya, who lives 10 kilometers away but I also have neighbors that live 70 or 80 kilometers away. The town is about 100 kilometers away. We don’t have much contact with the neighbors. Generally, we only visit other people during Spring Festival. We are used to it and so we don’t feel particularly lonely or feel that it’s inconvenient. Even so, we are very happy to see visitors.”

“What’s the hardest thing about living here?”

“The toughest thing for us is transporting fodder back here because our place is so remote. Other families at Sumu (Mongolian town) only pay about US \$128 to get fodder delivered to their house, but we have to pay about US \$256. It’s also difficult when one of us gets sick. But this land was allocated to us so we can’t just leave it. The land is vast and the vegetation is good, and I prefer to live here. Other families have more time and they can do other jobs for extra money but we can’t as we are always looking out for wolves. It takes up a lot of our time just looking after the cashmere goats. If they get lost it’s very hard to find them again. We are busier than other families. They make more money than us and they have to spend less than us: Although we can also make enough money. Other families have grass growing all year round but this is all we have. Everyone’s land allocation here is so large, so we don’t bother with putting up wire fences to separate it. We never have disputes about our animals wandering onto other people’s holdings. But because the Republic of Mongolia’s pastures are better than ours, sometimes if the camels cross that border they won’t come back. We are always losing camels to Mongolia. We started to put up fences and now the border control has also put up barbed wire fences and we are losing fewer camels now.”

When we went to visit Adiya at her home she also



Water is the most precious thing in the Gobi and a single well is normally shared by several households. To stop too many livestock collecting in one place, people usually live far apart and haul water from the well to their homes. Photo: S. Hasbagan

told us about wolf attacks against the camels. “My family has about 120 camels and 60 goats. Although we suffer many dry years our land is large and so we can survive. Over the years only about 10 camels have died. But the wolves from the Sino-Mongolian border kill a lot of our camels. In 2005 and 2006 they killed about 70 camel calves. That’s about one year’s worth of newborns. Wolves are very good at hunting camels and the only way to stop them is to set traps or chase them away on motorbikes. I have one big male who has been castrated and he once kicked and injured a wolf. My neighbor told me they saw five or six wolves attacking a camel herd once.”

The fact that wolves are still a problem shows that this area of the Gobi is very remote. The kinds of difficulties people face here are unimaginable to us. But these people never sounded complaining, they talked about their lives calmly and in an accepting way. Wolf attacks and natural disasters were simply part of life and they just dealt with it.

Although Cerenghorlo’s two daughters graduated from high school they chose to tend the family’s goats and camels rather than going to work in the city. All Adiya’s five children came back to

herding after finishing high school or military service. We wondered why these young people preferred to live in the Gobi rather than the city.

“Would you be happy to say ‘yes’ if the government asked you to move to the city?” we asked them.

“In the city we can’t continue herding and besides there are too many people there. We are not as well educated as the people in the city so we couldn’t compete with them. There are a lot of people in the city who don’t have jobs, so what could we do there?” one of the daughters told us. “We know how to look after livestock. In winter and spring it’s harder to take care of the goats but in the summer, we have time to dig ‘desert ginseng’ (*Cistanche deserticola*) and suoyang (*Cynomorium songaricum*) [herbs] and collect curio stones. We can sell them in the Sumu and make a bit of money on top of the income we get from the animals. The herbs grow with the bushes on our land and the price is very stable. The curio stones are fossils seeds of the ‘flowering almond’ (*Amygdalus mongolica*). They are small but a carton of them can sell for tens of dollars. From these kinds of sideline businesses we have made about US \$ 512 -641 this year.” The

girls showed us some of their ‘fossils.’ According to Professor Han Tonglin, a geologist, they are not really fossils but in fact small stones that have been eroded by the wind to look like fossilized seeds. We had spotted lots of odd-shaped stones like this during our journey in the Gobi. These stones have become a popular source of income for local people because they are so pretty.

As we were leaving the next day, Cerenghorlo gave each of us a few of these stones as souvenirs.

Before we started this journey, we all thought that the Gobi was a desolate, remote, poverty-stricken and backward place. However, once we started exploring our opinions and understanding of the Gobi have undergone major changes. We discovered that life here feels natural, free, peaceful and happy. We had escaped the noise and lights of the city. The people here are simple and kindhearted and they live in peace with the wildness of this desert. People here have many of the things that people in the city have such as cars, motorbikes, TVs, telephones, electricity (some of it wind and solar-powered) and daily necessities. Modern life has made its way here too. Local people are not wealthy but they are content. And although the Gobi is

Cerenghorlo and her two daughters live near the Chinese-Mongolian border. Although their home is very remote, she said they do not feel lonely. Her two daughters have chosen to work with animals here rather than live in the city. Photo: Zhou Haixiang





These car tracks have exposed the fine sand underneath the stones and show how a small disturbance can alter the Gobi. Photo: Zhou Haixiang



Erosion has carved these stones into slates and piles creating a unique landscape. Photo: Zhou Haixiang





Black Mazong (Horsehair) Mountain at the western edge of Alashan looks like a crouching dragon from a distance. The flat spaces between the mountain ranges are good grazing grounds. Photo: Han Ying

very remote it is not poor or backward!

“Our biggest problem is the ban on grazing. In the past, we used to eat meat in the mornings and evenings but now we can’t afford to do that. We have to go into town to buy meat and it’s too expensive. Also, because we have to drive a long way to get it we can’t buy it in the summer because it will go off before we get it home. So we have to give up eating meat.”

At that moment, a three-wheeled farm vehicle stopped in front of the house and a man, whose head was wrapped in a headscarf and who was wearing a face mask with only his eyes exposed, dismounted. Our hostess hurriedly put on a scarf and mask and rushed out to help him carry water inside. The man was her husband and he had just traveled 20 kilometers to fetch water. It had taken him two hours.

His name was Jirumtu. He told us that the water near his home was too salty for people to drink or even use to make soup. Even up to two hours after drinking it you would have a bitter taste in your mouth, he said. The animals can drink it and you can cook rice with it, but that’s about all. Even the camels’ tongues turn purple after drinking this bitter water although it doesn’t harm them.

Camels are one of the few animals that can survive the harsh conditions of the desert. They are extraordinarily tolerant to hunger and thirst. Photo: Zhou Haixiang



In the heart of the Gobi you can travel for hundreds of kilometers without coming across another human being. It took us more than half a day to arrive at this herdsman's house. Photo: Zhou Haixiang



"I am 44 years old and I came here with my grandfather when I was eight. At that time, only trusted people were allowed to live near the border. The land here is good. Even in years of drought, the reumuria is able to survive when all other plants -- even nitraria -- die off. As long as there is water, the camels can still put on weight. There is a kind of herb, we call zhenzhu (*Salsola passerina*), that grows in the ravines. It can fatten the animals just like grease. It helps the camels grow fat in the winter. Our camels here are all from the Gobi, they are different from those living in the desert dunes. Our camels stay strong throughout the winter and their humps don't shrink like camels from other places. I only have a primary school education and so I only know how to look after camels. I have about 100 camels now. As long as I can still look after them and

take them to water, I won't leave this place. But I am too old to go out and herd them back home anymore."

"What is the hardest thing about living here?"

"Nothing is hard as long as you have camels. You can drink their milk and use their hair, and even sell it. It's fetching about US \$ 6 a kilo this year. I can earn about US \$ 2,180 a year from my camels. On top of this, we can also use camel dung as fuel. Gobi camels are really valuable. They are our main source of money. Our biggest problem over the past few years is the grazing ban. My family used to have about 20,000 hectare of land. Because it was so large I never worried about the camels not being able to find enough to eat. When we were in a serious drought, the camels would just split up into smaller groups. When the grass is good, the camels stay in big herds, but when it is bad



Fetching water is one of the most important activities in the daily life of people living in the Gobi. We had to wait for two hours at Jirumtu's home in Eugger usu ghacaa, Right Banner, Alashan, for him to return with water. The people in the desert usually cover up their heads to protect themselves from the sand and the sun. Photo: Zhou Haixiang

While humans find it difficult to live in the desert, the Bactrian camel is ideally suited to life in the Gobi. Photo: Han Ying



We counted the numbers of plants in the re-forestation area and found that less than 1% of the ground was covered in vegetation and the average height of the plants was less than 10 centimeters. Stones covered more than 80% of the land surface. Photo: Zhou Haixiang





This barbed wire is marking out an area that is protected for re-forestation efforts. However, nothing except a few scrappy bushes grow on either side of the fence. There is no sign of a forest. Local people are relocated into towns as part of re-forestation efforts like this. Photo: Zhou Haixiang

they break off on their own. They can always find something to eat even when it is very dry. If it gets really bad we can always buy some food for them. In dry years we would sell off a few camels and buy fodder for the rest with the money. In a good year, we would buy more camels. But now I only have about 1,333 hectare of land because the rest was taken away a few years ago because of the Grazing Ban. Between the juun hoshuu (Left Banner) and baruun hoshuu (Right Banner), they put up barbed wire fences on both sides of the highway. Two camels got caught and died in the fences last year. I used to keep about 300 goats but now I only have 30. Our biggest problem is this Grazing Ban. In the past, we used to eat meat in the mornings and evenings but now we can't afford to do that. We have to go into town to buy meat and it's too expensive. Also, because we have to drive a long way to get it we can't buy it in the summer because it will go off before we get it home. So we have to give up eating meat."

The hostess served us rice and stir-fried vegetables without meat. She told us even the vegetables were bought from the town, dozens of kilometers away.

Over the past few days, we had only been given black tea to drink. The people here could no longer afford to buy meat and milk. In the cities, you can easily buy all kinds of dairy and meat products, so it

These curio stones are one of the family's sources of income. Photo: Zhou Haixiang





These sand dunes are actually mounds of small stones. Photo: Bai Ziqing

is hard to accept that these people can no longer have them. After this we always brought a carton of milk with us as a gift for our hosts and they were always very happy to accept it.

The wire fences which have been put up as part of re-forestation efforts have not only trapped the animals but they have also destroyed the traditional lifestyle of local people that is tens of thousands of years old. It has confused and perplexed the people here.

The barbed-wire fences on the stony desert land are an eyesore. The land within the fences and outside the fences does not look very different. Only when you get close can you spot some scrappy bushes hiding between rocks. We saw an abandoned house with a stack of firewood, a sheep pen and a nearby well. A small irrigation ditch built in the 1980's had also been abandoned. Our guide told us this place was called Huis tal and it belonged to Engger usu ghacaa, in Alashan baruun hoshuu (Right Banner). The land bounded by the wire fence was designated as a re-forestation zone and all the local people who had lived inside it were relocated.

Is it called re-forestation but we couldn't see any trees. To investigate we marked off a plot of 100 square meters and counted all the varieties and numbers of plants growing there. This is what we found: 70-80% was covered by small stones with less than 1% covered by vegetation. We found two plant species -- 34 reumuria and 19 zhenzhu (*Salsola passerina*). Not one plant was over 10 centimeters high and they all had sparse foliage.

Can you call that a forest? Such tiny and scattered vegetation does not look like a forest and so it is hard to understand why they are calling it a re-forestation effort. And all those local people have been moved away because of this.

So we asked Zhu Zongyuan to explain. He said: "A real re-forestation project should first have a 'forest' and secondly it should attempt to protect the area's ecology. When Professor Guan Junwei, from the China Academy of Sciences at Beijing Forestry University, proposed such a re-forestation project, he had good intentions. He was actually referring to trees such as tamarisks and birches. But apart from the sagsaoul [*Haloxylon ammodendron*] it doesn't make sense to include small shrubs like the reumuria and *Nitraria sphaerocarpa* in such re-forestation efforts. Although all the indigenous plants here play some kind of role in the local ecology they cannot play the role of a forest. The government should take this point into account."

It is obvious that re-forestation projects here are inappropriate. After visiting the Gobi and seeing the Grazing Ban in action and meeting relocated families we are not sure that this is the right action. What

is vulnerable about the desert and how can people develop this land?

Zhu Zongyuan said he believes that the Gobi's eco-system really is vulnerable. The plants that live here struggle to grow in this environment. Once it is harmed, it is very hard to recover. However, if the environment is left alone it is relatively stable. The desert has evolved over tens of thousands of years. It is not a problem for families to live here with their camels because the Gobi is so vast. If you fence off parts of the land then they may develop insect pests and plant diseases.

His comments confirmed what we saw in the Gobi, that the land that was still open for grazing was in better condition than that which had been fenced off. Over the centuries, the nomads traveling with their animals had done no damage to the land. Their way of life was sustainable and actually the Grazing Ban and relocation had created many problems.

Uulenbayar is 35 years old and he lives in one of several households that we visited in the Hoyar hudug Migrants Village. He told us: "Some families from my Ghacaa (village) moved here but most have lost money and can't pay back their loans because none of us know how to do this kind of farming. About half of the people who moved here went back after a couple of years. The situation is worse for us Mongolians. I am the only Mongolian remaining here and I stayed because I married a Han Chinese woman from Minqin [Gansu Province]. When we first came, we knew nothing about this kind of farming. We just copied what others were doing. I have only just begun to know how to do it properly. But farming here is so hard. In my whole life I have never worked so hard, digging ditches and irrigating the land. It is much harder than grazing livestock.

"Many people moved back to the desert because they couldn't adapt to this life. But when they went back they didn't have any rangeland or any livestock so the only way they can make a living was by digging up stones, picking herbs or running small businesses like restaurants. For those of us who have stayed here, we can only just about make enough money to live."

Back in the Gobi in Alashan baruun hoshuu (Right Banner) we had actually met a family that moved back from Hoyar hudug. They made their living by selling stones. Because they were stranded between the herding areas and the city, they didn't have residence permits or identity cards so their children couldn't go to school or get married.

As we were leaving the Gobi, we tried to answer a question that was in all our minds. How did a policy that was meant to both improve the environment and people's living standards create such a mess?

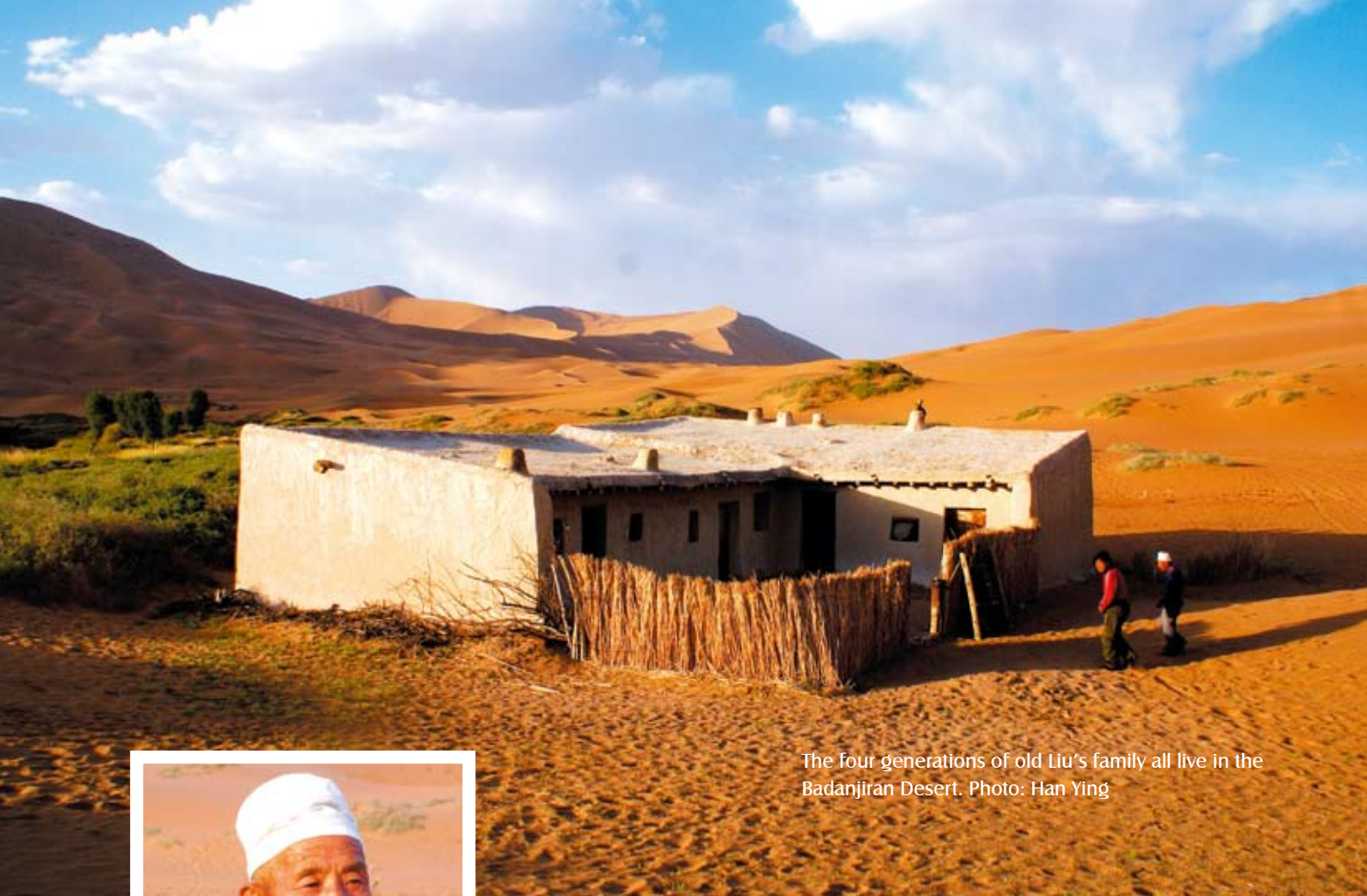


On the top of the highest sand dune of the world one can see seven emerald lakes around it. This is one of the lakes. Photo: Zhou Haixiang

Life in the Shadow of the Dunes

Mulang





The four generations of old Liu's family all live in the Badanjiran Desert. Photo: Han Ying

The Badanjiran is the world's fourth largest, China's third largest and Alashan's biggest desert. It stretches across 50,510 square kilometers, that's about half the size of Iceland. The Badanjiran has 114 lakes; 74 have water year-round, and 12 of these are fresh water lakes. It also boasts the highest sand dunes in the world. Nearly 70 per cent of the desert is covered by dunes over 100 meters high. The tallest, nicknamed "Everest," is 400 meters high.

Alongside "Everest" lives an old man called Liu Fuzhuo. Before our arrival in the Gobi, when we had heard about families living deep in the desert, our initial reaction was that it must be very hard to live under those conditions, with no modern amenities such as highways, electricity, running water, gas, TV, Internet and hospitals. As city dwellers, we couldn't imagine such a life. But there we were, sitting in front of his house sipping black 'brick' tea he had made for us, and listening to him tell us stories about his life. We

were deep in the desert but the sky was blue, the lake looked pristine and the sand dunes were golden –really picturesque.

Mr. Liu, who is 70 years old, is an experienced herder in Badain Jaran Ghacaa (Mongolian village). His family has lived in the desert for four generations (he is from the second.) He migrated with his parents from Minqin in Gansu Province when he was 13 years old. The first thing he did was to look after camels. He has two daughters and a son and quite a number of grandchildren. All his children have moved away to live in apartment buildings in the city where he also stayed for a while. Although his children wish he could stay with them and enjoy his retirement in the city, the old man says he just can't get used to the modern style of living. First of all, he doesn't like the taste of the sterilized tap water and food cooked on a gas stove. He said they either tasted weird or just too bland. But for us city dwellers, purified water and gas-cooked

food are something very normal and we take both for granted.

Then the old man began unhurriedly describing his simple life in the desert. He is a widower and lives here by himself, apart from the sheep and camels he looks after. At peak times he takes care of about 60 camels and 400 sheep.

The old man says the best thing about living in the desert is the environment. He said he can get whatever he wants and he feels self sufficient here. "Look at my house," he said. "I built it without spending any money. All the materials can be found in the desert. I got the timber from some poplar trees I planted; the mud and water from the lake; and of course there is sand all around. I planted 100 trees and they all grew up. I used the three-year-old trees to make rafters, the five-year-old trees for horizontal roof beams, and the 10-year-old trees for other beams. There are only a few trees left now as I gave most of the rest away to other people in the ghacaa and to the monastery for building.

"Mutton from sheep reared in the desert is so tasty. Sheep are better able to survive here than cashmere goats because they are better at climbing dunes. Good grass grows on some of the sandy slopes and those animals that can't climb well don't fatten well because

they can't get enough to eat.

"The desert is also good for raising sheep because you don't get any cold rain. On the grasslands many lambs fall sick or are even killed by cold rain and there is no good way to stop that happening because their enclosures don't have roofs. When it rains in the desert I have a good method to protect the flock. I dig holes and put the lambs inside and cover their bodies with sand without covering their heads. Sand keeps the heat but does not hold water. When the rain stops I just dig them out again. So during rainfalls all you can see are the lambs' heads just sticking out of the ground. Few lambs now die from exposure to rain. In the summer I also catch brine shrimps [Artemia salina]. Sometimes I can catch hundreds of kilos in just one season. I sell them for about US\$ 10 a kilo. In 1999 the price rose to about US \$ 36 per kilo."

And there are lots more benefits to living in the desert according, to Mr. Liu. He uses clean sand to rub off oil stains on his clothes and he likes to walk barefoot on the sand because it is clean and free of sharp objects. He even likes to sleep on the dunes – just find a downwind spot in the summer, or take a quilt with you in the winter and dig a pit in the sand. The sand retains its heat for a long time and it's like sleeping on a



Mr. Liu has lived in the desert all his life and he prefers to squat on the sand when talking with us out of habit. The old man's earthen house is behind us. His kang (earthen bed) in the house is made of sandy earth and the floor is spread with a thick layer of clean sand. The locals say they use bags of sand as diapers for babies – it's both environmentally-friendly and saves money. Photo: Zhi Feng



kang (a stone or clay bed-platform common in northern China with a stove underneath that keeps it warm.)

As I listened to him, I couldn't help thinking what would happen to this place if more people started coming here. It would no longer be comfortable walking barefoot in the sand or sleeping in the dunes if everyone started littering in the desert. As we drove back to Beijing, some of our team members said it was a pity we hadn't tried sleeping in the desert "with the sky as our roof and the ground as our bed." In that way we could have got closer to the desert. I couldn't agree with them more.

Mr. Liu said that food, water and bathing were all convenient in the desert. In the rainy season, he said, lots of edible plants grew, for example "desert rice" a wild grass [*Agriophyllum arenarium*] was quite common. The seeds of the desert rice can last for 30 years – they don't rot or suffer from insect damage. They taste delicious when they are ground up and baked. In the desert, it is easy to make pancakes. First make a little pit in the sand and heat it up. Put in the dough and then cover it up with the heated sand. In less than 20 minutes the pancake will be ready. The sand is easily brushed off with a towel. In the summer,

the lake is full of drinking water and in the winter you can simply melt the snow for drinking water. It's too cold to bathe in the winter but in the summer you can just leave a bucket of water in the courtyard in the sun and leave it there to heat up. "Everything is free here. Not like in the city." Mr. Liu kept saying.

Mr. Liu said the reason people from outside believe that life in the desert is hard and the desert is just a windy and sandy place is because they have never experienced it for themselves. He is totally at home in the desert. He said it is not always windy, the strong winds usually only hit the tops of the dunes. Down

Photo:Zhou Haixiang



here where he lives they aren't really affected. And after a while life is really very comfortable. The only problem is that the wind is very erratic which makes it impossible to generate power with a turbine. Instead solar panels are used.

In the middle of our conversation, he took us into his house. Compared to city homes, Mr. Liu's house was very simple. The only belongings he had inside were an earthen bed, a quilt, a small table and three stools. The solar panels on the roof feed a light bulb and that's the only electrical equipment we could see. As I wondered if the old man ever got bored here, our guide, who was a good friend of Mr. Liu, reminded us that most of his belongings were in the city. This was only his temporary home as he couldn't settle properly in the city.

The Mr. Liu talked to us about how life in the desert compares with life in the city. "Of course city life is more convenient than living in the desert. But people grow spoilt if they live like that for a long time. Also the water and air quality in the city is not as good as it is here. It is also true that living in the desert requires a lot of hard work. I need to tend the sheep, camels, grow vegetables and fish for shrimps. But with all this to do I am never bored and it keeps me fit. I have a healthy appetite and I sleep soundly. The most important thing is that I am used to life here and I find life in the city too complicated. When I have nothing to do and feel bored then I can always cheer myself up by going to the dunes and chatting with my camels."

A model for living in an arid world

Xiang Xia



To fight droughts, the fleshy leaves of the nitraria have evolved small in size. Photo: Zhi Feng



Z. fabago (or opuntia) can store water with its fleshy leaves and stalks. It stays alive in dry soil as it absorbs enough water when it rains in preparation for the drought spell. Photo: Zhi Feng



The root system of the long-leaved reumuria is capable of seizing water from the soil rapidly for speedy greening, blooming and fruiting by making full use of the short and limited precipitation in a dry region. Photo: Zhou Haixiang

With one third of Alashan covered by the Gobi, a journey across it becomes an adventure in the sand.

The first question many Gobi first timers ask is what exactly is the Gobi? A dictionary definition would give you: "The Gobi is desert land covered by a layer of coarse sand and gravel making it difficult for plants to grow." So when we set off for Alashan we had this image in our minds. However, at the end of the journey our understanding of the Gobi had gone way beyond the simple dictionary definition.

When we first arrived, the Gobi appeared to be just a world of rock. It was like we had landed on a lifeless planet. The rocks, apart from the fact that they were all different sizes, looked identical. We couldn't imagine that any form of life could survive here. Although we saw hopeful signs, in the end they turned out to be vaporous mirages on the horizon, always unreachable. But as we spent more time in the Gobi and traveled around, we began to understand much more about this place.

We realized that signs of life could be found in even the harshest of environments. On the vast expanses of the desert, scrubby low bushes could be seen at several meter intervals, some almost hidden by the dunes, others with exposed root systems, and all bent and twisted by sandstorms and hard and tough like rocks. In such a stony environment, the bushes have clung to an ecological niche and there they stuck fast. Because of their versatility and extraordinary ability to find any little drop of water they have managed to survive. What is the Gobi? Well, we now believe that it is a place where the toughest life forms on this planet exist. You have to respect every little tiny bush in this desert.

The Gobi's harshness comes from its aridity, its gusty winds that blow everything away except the rocks, and its high altitude. While the neighboring lowlands can retain some soil to sustain basic life, the Gobi is incapable of holding onto anything. It is desolate while it throws its sand to the outside. Because there is so little water and so little soil in the Gobi, plants that grow there grow sparsely. It is the only way to survive.

The most thrilling sight in the Gobi is a herd of camels, even when they are few in number. In such an austere environment, any sighting of a living thing can cause a wave of excitement. We quickly realized that the locals were right, camels survive by staying on the move, feeding on plants along the way. Their long neck is adapted to reaching bush leaves and their long legs are capable of carrying them long distances to seek for food. Desert plants and camels are wonders in the desert and they live side by side in the Gobi. The locals often say that the Gobi belongs to the



Potaninia mongolica is capable of reproducing by splitting its roots and getting through a drought by "faking death". Photo: Zhi Feng



Potaninia mongolica in a "faked death". Photo: Han Ying

camels because other animals like the cow, horse and sheep, cannot survive here. It is surprising to see such a large animal survive in such an inhospitable environment. It is nothing short of a miracle that this desert can provide a home for plants that in turn can feed such a big animal. If you look at it in this way, the Gobi is actually a highly efficient system.

Unlike much of the rest of China, there are hardly any people in the Gobi. Sometimes you can travel for more than 100 kilometers before you come across a house. At Del uul (Horse Hair Mountain), in the westernmost part of Alashan, we traveled a round trip of 450 kilometers just to interview one household. Many households operate vast amounts of land for grazing, up to hundreds of square kilometers. Such an area of grassland is unimaginable in many other regions. To stock up on grain and drinking water, many residents go into town which may be hundreds of kilometers away. They will buy supplies to last them anything from six months to a year. Camels will drink any kind of water but people need clean drinking water so to carry this they may have to travel up to tens of kilometers to the nearest clean water source. The water hauled home each time can last for about two weeks. The locals told us that they are used to living so far apart from other people. This kind of lifestyle is simply an adaptation to the Gobi. When we first arrived we would often ask why they chose such an isolated life. Didn't they think it was backward to live like this? But after a while our ideas changed when we were in the heart of the Gobi. The Gobi is a place of rocks, sparse vegetation, camels, little water and homes separated by distances of tens or hundreds of kilometers from each other. It is a place where everything -- living or non-living -- complements and coexists with each other. Such isolated existences are not backward at all. It is simply a choice which best suits the environment.

On the road we came across a sight which puzzled us: Endless wire fences had been erected in the desert. We were told it was a government project to protect the Public-benefit Forests. Not one of us could understand why. What is more incomprehensible to the local is the pointless project is just the reason they are asked to move away to live in settlements, despite their long experiences in the desert that living apart from each other is the only sensible choice in a waterless environment.

When it was time to bid farewell to the Gobi, our initial impression of barrenness and monotony was replaced by a vivid scene of a range of colors -- gray, black, yellow, red and green. It was a beauty that we had never seen anywhere else. It wasn't just rocks, there were shrubs and camels and people. It was only by exploring and spending time in the desert that we discovered the Gobi is a model of how people can live in arid environments.

Sacsaoul is one of the drought-resistant plants and diet forage for the camels. It also serves as a wind/sand-breaker. Photo: Zhou Haixiang





The strange-looking *Populus euphratica* Oliv tree
against the setting sun. Photo: Zhou Haixiang





Photo: Li Dajian

