United Nations Environment Programme

Evaluation of the Lop Nur nature sanctuary biodiversity conservation project

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Evaluation and Oversight Unit

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Contents

List of acronyms

CEJA	China Environmental Journalists Association
EPB	environmental protection bureau
EPD	environmental protection department
FECO	Foreign Economic Cooperation Office
GEF	Global Environment Facility
LNNR	Lop Nur Nature Reserve
NR	nature reserve
SEPA	State Environmental Protection Administration
UNEP	United Nations Environment Programme
WCPF	Wild Camel Protection Foundation
WEP	West-East Pipeline Project
XEPB	Xinjiang Environmental Protection Bureau

Executive summary

1. The Lop Nur Nature Sanctuary biodiversity conservation project commenced in March 1999 and continued for 43 months. It was carried out by the Chinese State Environmental Protection Administration (SEPA), in close collaboration with the Wild Camel Protection Foundation (WCPF). An evaluation was conducted during March and August, 2003, to measure the implementation of planned project activities, outputs and outcomes against actual results. The evaluator conducted a desk review of the project document, outputs and monitoring reports; carried out a short field trip to the nature reserve, reviewed surveys, publications and materials; and held interviews with stakeholders.

2. The evaluator analysed the threats to the survival of the Bactrian wild camel population from human activities, illegal hunting, the lowering of the groundwater table, grazing and wolves and reached the conclusion that the threats to the survival of wild camels and local biodiversity mainly derive from human activities within the region and unsound water use for development outside the region. Strategies to combat those threats take the form of modification of human activities within the region and water use for development outside the region. The following activities could be conducted to change human activities in the region: first, efforts should be made to raise awareness among persons associated with mining activities (especially miners), explorers, prospectors, employees of road construction companies, tourists and farmers grazing their domestic animals in the region; second, all sites with human activities should be mapped and regular or spot checks conducted; third, cooperation should be developed with local government in the area of mining planning; fourth, a reporting mechanism should be set up for people to report camel sightings and cases of illegal hunting and their suggestions listened to; and, fifth, the wolf population in the North Arjin mountains should be monitored and surveyed . The following activities could be carried out to adjust water use for development outside the region: first, there should be an awareness campaign targeted at such groups as public officials both at provincial and national level, upstream planners and sectors with high water-use; second, salt water springs should be mapped and monitored; and, third, there should be extensive planning of the use of water in development.

3. Using the analysis carried out on problems and strategies the paper evaluated the activities conducted by the project.

4. The national Xinjiang Lop Nur wild camel nature reserve was established and expanded to cover 78,000 sq km. A management system has been established by the Xinjiang environmental protection bureau, which consists of one management centre in Urumqi, three management sub-centres located in Bayingolin, Hami and Turpan, and five checkpoints in Miran, Lapeiquan, Nanhu, Tikar and Aydingkol lake. There are ten staff members and a total of 150 sq m of office space with a fixed fund of 325,000 yuan renminbi each year allocated to the management centre, which covers basic operations. The Hami management sub-centre is the most active of the three. It has three staff members, whose salaries are covered by the Hami environmental protection department. Staff hours and salaries in the other two management sub-centres have not been established and activities are behind schedule. Five checkpoints with buildings have been established. The Nanhu checkpoint is operated by the three staff members from the Hami management centre, who are experienced in public awareness-raising, registration and the issuing of permits to enter the nature reserve. The Tikar checkpoint is well placed for the observation of activities within the nature reserve. Aydingkol lake checkpoint is located on the site of a former military base. Miran checkpoint is located in Ruoqiang county. These three checkpoints are non-operational because of management problems within the Turpan and Bayingolin management centres. Lapeiquan checkpoint is also not in operation, owing to its remote location, extremely harsh conditions and great distance from residential areas.

5. Four Jeeps were bought and are being used by the nature reserve management. Radio equipment has been installed and is functioning well. Several scientific surveys have been conducted, resulting in the incorporation of a scientific and monitoring plan into the management plan. Public awareness programmes have been a great success, producing films, publications, brochures and exhibition displays of a high quality. There has been an improvement in public awareness of wild camel conservation at local, national and international levels.

6. The international conference on the protection and conservation of wild camels in China and Mongolia held in August 2000 strengthened international cooperation in this field, resulting in the adoption of a number of resolutions and the signing of a letter of intent on the protection of wild Bactrian camels between SEPA and the Ministry of Nature and Environment of Mongolia on 29 August 2000. The project is very sustainable, having strong support from the central, provincial and local governments, as it is now a national nature reserve. Compensation for the West-East Pipeline Project (WEP) will also provide funds for the management and conservation of the nature reserve.

7. Based on the above information, the evaluator has awarded the following grading to the project:

Timeliness = 3;
Attainment of outputs = 2;
Completion of activities = 2;
Project executed within budget;
Impact created by the project = 1; and
Sustainability =1.

The overall score was 2.

8. Some of the conclusions drawn are appended. Implementation of the project was made easier by the specific emphasis placed on the promotion of effective management of the sanctuary. Efforts conducted through government channels have secured strong government support at all levels and a high degree of sustainability, although there could be more support from the Turpan and Bayingolin prefectures. The public awareness programme is a good example of the collaboration between local government, the management centre, the provincial environmental protection department, the China Environmental Journalists Association (CEJA) and the Wild Camel Protection Foundation (WCPF), which has successfully educated interest groups at local, national and international levels. The involvement of international organizations in conservation, such as WCPF, has improved international cooperation on wild camel conservation and helped establish an international policy on nature reserves and conservation management. A management structure relying on local government is to be set up, but plans for this and capacity-building should be in place before anything is initiated.

9. In conclusion, the evaluator proposed recommendations for future activities. Efforts should be made at the provincial level to develop a Xinjiang biodiversity strategy and action plan. The relevant bodies should be encouraged to implement the regulation of mining activities and place proper controls on water use. A committee of local, national and international experts should be established to devise a plan of operation for the management of the nature reserve. A revised management plan is needed, giving details of measures to be taken, sources of funding and projected actions. Specific plans for the different areas in the region should be developed, as well as a plan that spells out the appropriate use of WEP compensation. Training and capacity-building should be increased to create a better understanding of environmental principles, survival techniques for living in the wild, monitoring procedures and skills. An assessment should be made of the potential threats posed by potassium mining, with a view to reducing the negative impact of this activity on the survival of wild camels and the range of local biodiversity. Scientific surveys and monitoring should be strengthened. Checkpoints and patrols should be made more effective.

I. Background

A. Lop Nur nature sanctuary biodiversity conservation project

10. The Lop Nur Nature Sanctuary biodiversity conservation project, referred to in this paper simply as “the project”, was launched as a short-term emergency measure for the conservation of highly endangered globally significant biodiversity and for the removal of the root causes of biodiversity loss in the Lop Nur sanctuary. Its objective was to promote effective management of the sanctuary by providing the right conditions for the preservation of its globally significant endangered biodiversity. The duration of the project was 43 months, starting from March 1999.

11. The executing agency, the Chinese State Environmental Protection Administration (SEPA), worked in close collaboration with the Wild Camel Protection Foundation (WCPF) and was responsible for the day-to-day management of the project. The project was implemented using funds from the Global Environment Facility (GEF) Trust Fund ($25,000) and co-financed by SEPA and WCPF with contributions from the private sector and other areas (total co-financing amounted to $700,000).

12. The evaluation of the project was to take place between 12 March and 25 May 2003 , comprising a three-week evaluation carried out over a period of 10 weeks. The first draft of the evaluation was of such poor quality that the entire report had to be redrafted, occasioning a substantial delay in its finalization. The objective of the evaluation was to analyse the impact of the project as well as to compare and contrast projected activities, outputs and outcomes against the actual results.

B. Evaluation methodology

13. This evaluation has been conducted on various levels. Its findings are based on desk reviews of the project document; output; monitoring reports; reviews of specific items, including surveys, publications and material; and interviews with stakeholders.

14. The evaluation began with interviews with the team leader of the self-evaluation conducted by SEPA between September and December of 2002. The team leader was generous enough to supply all his evaluation documents. The UNEP programme officer in charge of GEF medium-sized projects also kindly provided the evaluator with all communications and documents relevant to the project. The evaluator went on a very productive field trip to Xinjiang from 13 to 19 March. Together with the director of the management centre of Xinjiang Lop Nur wild camel nature reserve and three other staff members from the management centre, the evaluator travelled from Urumqi, the capital city of Xinjiang, to Hami, Shanshan and Turpan, which is located north of the nature reserve. A participatory evaluation methodology was applied. The evaluator had the opportunity to consult a great number of people, including the directors of the environmental protection departments of the province and counties, the staff of the Lop Nur wild camel nature reserve, officials and experts from local communities in Urumqi, Hami, Shanshan county, Turpan and the three northern checkpoints (see the itinerary in annex VI for more details). The visits to these checkpoints proved to be a great help in assessing the impact and effectiveness of the project.

15. The evaluation of the project is more than just a comparison of the original plan with the actual results, but is also aimed at combating threats to wild camels and biodiversity in the region. Accordingly, it contains additional sections on the general condition of wild camels, as well as an analysis of the problems faced and the strategy to be adopted in mitigating these threats.

II. Wild camels throughout the world

16. Two-humped wild camels, which were once plentiful in Central Asia, are now only to be found in four areas: the Taklamkan desert; the Lop Nur region; the North Arjin mountains and the Outer Altai Gobi in China and Mongolia. The evaluation paper is based on three major studies on the distribution of wild camels: Sokolov’s 1959 study; the study made by G.U. Jinghe and others during the 1980s (G.U. Jinghe and others, 1991) and the recent study of the Lop Nur region made during 1995–2001 (Yuan Guoying, 2002). The distribution map (figure 1) incorporates the findings from all three studies.

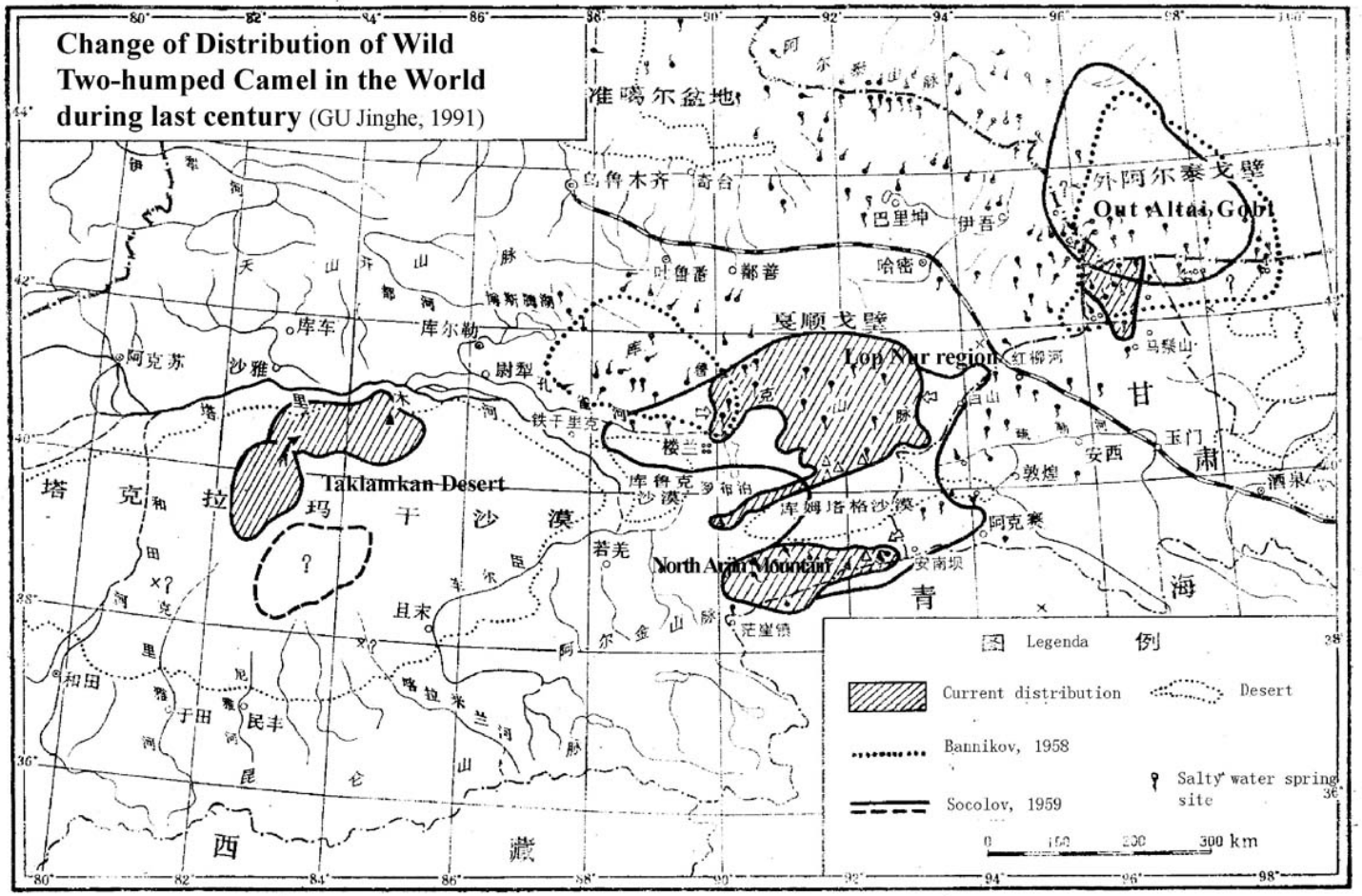


Fig 1: Wild camel distribution in the world (G.U. Jinghe et al. 1991)

Note: Current distribution is restricted to China

A. Taklamkan desert

17. According to surveys conducted by G.U. Jinghe and his colleagues in the 1980s, the northern part of the distribution area along the river has been abandoned since the 1940s, following the draining of the upper Tarimu River. The original distribution area of the wild camel has consequently shifted to the east, north and south and has doubled, as fewer animals are in any one particular region. There are now between 40 and 60 wild camels in this region (Zheng Changlin, 1998).

B. Lop Nur region

18. In this area the original distribution of wild camels has shrunk by more than 40–50%. The aridity of Lop Nur lake has created a very harsh environment with very stiff salt shells where vegetation is unable to grow. Lop Nur lake is therefore no longer suitable for the continued survival of wild camels and the lake basin has fragmented the distribution of wild camels within the Lop Nur region. The original distribution of wild camels in the western part of the area has shrunk dramatically and in the northern part it has also shrunk by over 100 sq km compared to figures for the 1970s. According to the study made in 1980–1981, estimated numbers of wild camels ranged between 1,070 and 1,340, and in 1995 their number was believed to have dropped to a mere 60–80, representing a decrease in the wild camel population to between one fifteenth and one eighteenth of their original level over a 15-year period (Yaun Guoying, 2002).

C. North Arjin mountain

19. The main distribution in this region is located on the northern part of East Arjin mountain. The original eastern distribution has dramatically shrunk north up to the edge of the Kumtag desert, and distributions in the south and at the ridge of the Arjin mountain are no longer in existence. It is estimated that there are 280–340 wild camels in the region.

20. Although there is a large area of fragmented distribution in the Kumtag desert, the two main groupings of wild camels in the Lop Nur region and the North Arjin mountain are believed to migrate along river valleys to the eastern and western ends of the Kumtag desert (Yuan Guoying, 2002).

D. Outer Altai Gobi

21. This area is located along the border between Mongolia, Xinjiang and Gansu in China. The reduction in the distribution of wild camels in the outer Altai Gobi is caused by the development of animal husbandry in the region. It is estimated that there are about 350–400 animals in this region (Zheng Changlin, 1998).

III. Analysis of threats to the survival of wild camels and other forms of biodiversity in the nature reserve

22. In order to evaluate the implementation and impact of the project, the evaluator had to be familiar with the threats posed to wild camels and other forms of biodiversity and the measures designed to control them. To this end, the evaluator conducted research on problem analysis during the evaluation.

23. The evaluator studied the scientific literature and documents produced by the project, consulted with staff members from the nature reserve and the personnel manning the three checkpoints, and held a workshop to which six local experts, the names of whom are listed in annex V, were invited. Discussions with local experts and middle-aged to elderly inhabitants who have lived in the area all their lives proved very successful. The following are the conclusions reached on threats to the survival of wild camels and biodiversity in the nature reserve. The level of gravity of each of these threats is based on the opinions of local experts and endorsed by many reports on the project.

A. Human activities

24. Mining is the major activity in the nature reserve . According to the evaluator’s study of the Tikar checkpoint, mining activities in the nature reserve are much more intensive than suggested by project reports and are continuing to expand. The construction work under way for potassium mining

in Lop Nur lake within the so-called “prohibited military area”, constitutes a grave threat to wild camels and biodiversity in the region (see section E of chapter VIII below for more details). The evaluator is also aware of several mining sites within the core area of the nature reserve or at the western edge of the prohibited military area which are also important distribution areas of wild camels.

25. Roads under construction for the West-East Pipeline Project (see section F of chapter VIII below for more details), as well as those planned for the potassium mining activities, are sure to disturb the activities of wild camels (see figure 3 in chapter V, for wild camel distribution in the nature reserve). The road to the West-East Pipeline Project generally lies outside the wild camel distribution area, whereas that to the potassium mine, although within the prohibited military area, traverses the core habitat of the wild camels. A road will also be constructed across the southern nature reserve, over the Lapeiquan checkpoint, stretching over or even into the Arjin mountain habitat.

26. Other activities, such as exploratory tourism and car racing, only take place sporadically. Tourism occurs to the west of Loulan, which is located in the prohibited military area, and at the western edge of the Goshun Gobi wild camel distribution area. Tourism activities are also concentrated on the edge of the Goshun Gobi habitat to the east of Dunhuang, which reaches into the east of the nature reserve. Explorers and tourists do encroach into the centre of the region several times a year, though this trend is increasing.

B. Illegal hunting

27. Illegal hunting, which was primarily an activity engaged in by local communities to acquire food, was prevalent in the area between the 1950s and 1970s. Confiscation of private guns began in the 1980s, followed by the confiscation of guns from possemen (armed local farmers) and culminating in a total ban in 1998. It is rumoured that a certain amount of illegal hunting is still carried out by law enforcement officers in possession of guns. According to information obtained during interviews with inhabitants, however, the evaluator believes that there is little incentive for local communities or even outsiders to hunt wild camels, since these animals live in harsh terrain and are not of great economic value. There may of course be cases where wild camels are accidentally killed during hunting of other animals in the northern Arjin mountain. . Moreover, there is still the risk that miners will kill wild camels for food when the animals venture too near their mining sites. At the Tikar checkpoint, the evaluator inquired whether there were any accounts of wild camels being killed as a consequence of the heavy truck traffic through the area, but the responses were always negative.

C. Lowering of the groundwater table

28. The evaluator asked local inhabitants living near the checkpoints what they felt were the issues that most threatened their own livelihoods and the wildlife around them. The unanimous answer was: shortage of water. No other issue was considered as even a minor threat. These consultations led the evaluator to conclude that shortage of water is the main cause of biodiversity loss, at least in the northern nature reserve.

29. Approximately ten years ago there were two rivers running through Nanhu town and a lake that provided enough water for grazing, cultivating crops and ensuring a comfortable living environment. Rainfall levels have not changed, but a huge demand for water in agricultural use along the upstream river has caused a drop in the water table. Surface water is drained from the upper streams, resulting in a shortage of water downstream. The downstream area consequently has to use groundwater as the main source of water for urban development and agricultural irrigation.

30. Changes in the hydrology around the nature reserve have caused a loss of local vegetation, making living conditions more difficult. Interviews with local people suggested that there was significant degradation of vegetation in the Gobi. Within the wild camel habitats the groundwater table has undoubtedly lowered. Many salt-water springs marked on maps in the past could not be found during recent surveys. Vegetation within the region relies essentially on groundwater, since surface evaporation is such that little water can be saved for vegetation. According to surveys taken in the 1990s, the wild camel population of Arjin mountain (280–340) is much larger than that in the Gashun Gobi region. A contrary situation emerges from surveys from the 1980s, which indicate that Gashun Gobi had a larger camel population (1,070–1,340) than the Arjin mountain (300) (Yuan

Guoying, 2002). Hunting alone cannot explain why the Gashun Gobi region is so much more at risk; additional factors must be looked at. In the North Arjin mountain region, water from melted snow provides a better supply of water to the underground reservoir. The evaluator is concerned that the lowering of the groundwater table is causing a loss of salt water springs – which provide water resources for wild camels – and also a loss of vegetation in the greater part of the nature reserve. This may necessitate the movement of wild camels closer to the north of the Arjin mountain. Local experts, however, did not place as much importance on this.

D. Grazing

31. From the discussions and consultations that the evaluator had during this trip, she concluded that domestic animal grazing is certainly not a big issue in the north. The scale of grazing has reduced dramatically over the last ten years, owing to the loss of suitable vegetation in these areas. Within the northern boundary of the nature reserve there is no grazing at all.

32. In the southern and southeastern areas of the nature reserve, according to project reports, grazing has the greatest impact in the northern piedmont of the Arjin mountain. About 250–300 domestic camels from Arksai in the Gansu province have been herded deep into an area situated 50–60 km northwestward in the nature reserve , and graze near Lapeiquan which is the central zone of the wild camel distribution area. (see figure 3 in chapter V). It is suggested that grazing may cause degradation of vegetation and that competition for food and domestic camel grazing may lead to hybridization, but the evaluator is not familiar enough with the subject to make an informed judgement.

33. The evaluator made the deduction that the development of animal husbandry was responsible in the past for the decrease in the eastern population of the Goshun Gobi region and the Arjin mountain. Owing, however, to the degradation of the vegetation, the environmental conditions are now too harsh for any domestic animals other than domestic camels. The inhabitants of the northern region confirm that the number of domestic camels was very high in the past, but has dropped to a minimal level, as there is little economic value in raising camels. There is such an extensive habitat for wild camels that grazing activity on such a small scale will not pose too big a threat, although there may be some risk. If the area, extensive though it may be, is unable to provide sufficient food or a suitable environment for wild camels due to environmental degradation, they will have to move further south and southeast for food, water resources or even cooler temperatures.

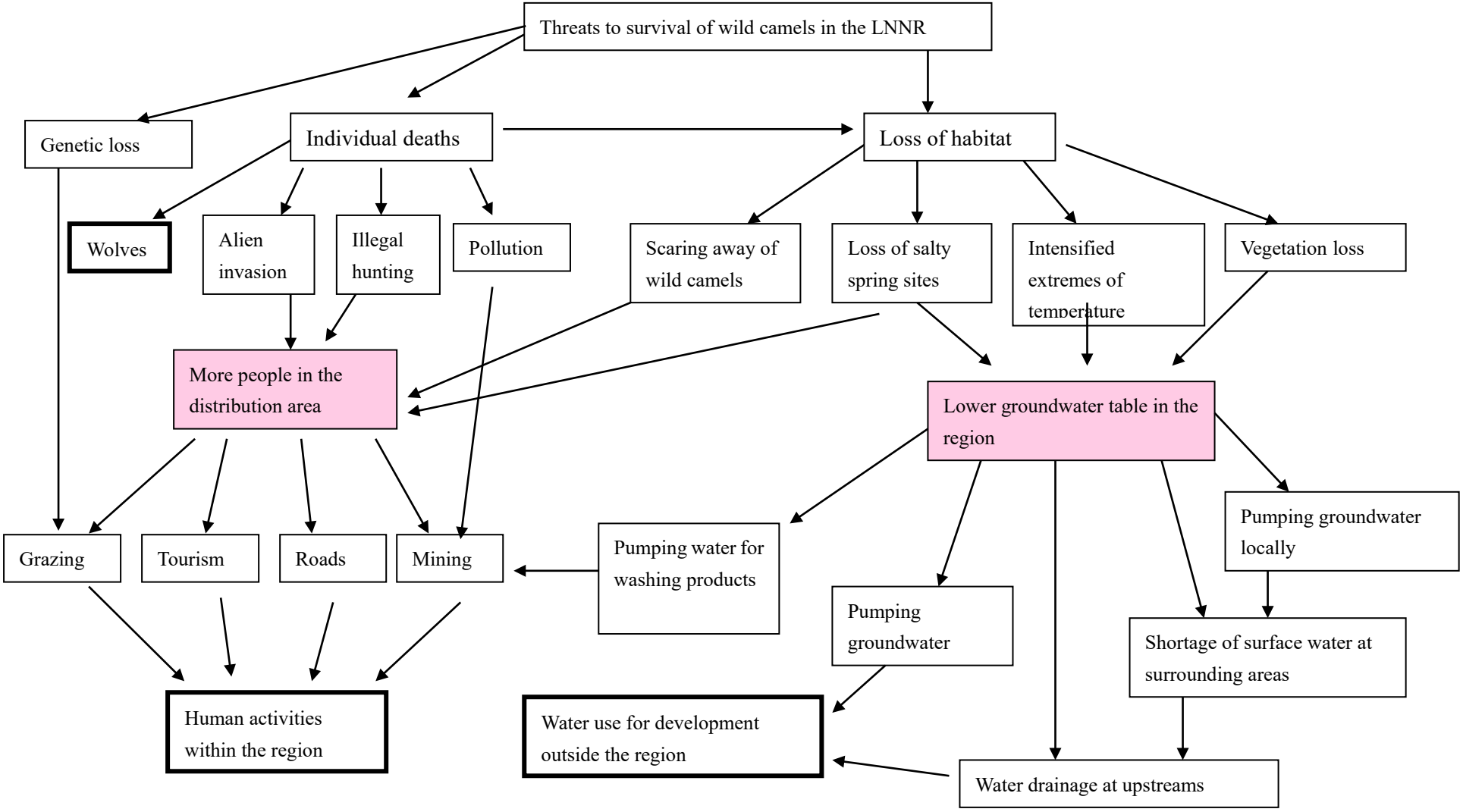
34. The hybridization of wild camels and domestic camels is potentially a great threat. The successful breeding of hybridized domestic camels raises the concern that this may also be possible in the wild. An additional threat to the survival of wild camels is the alien diseases domestic camels can transmit from human residence to wild camels. If this happens, it could spell disaster for wild camel populations.

E. Wolves

35. Local experts have noted that wolves on the Arjin mountain have preyed upon several wild camels. The hunting of wildlife by wolves is, however, part of the natural ecological process. As long as the wolf population does not reach too high a level, and this should be carefully monitored, there is no need for control of the wolf population. It is only in the north of the Arjin mountain region that the distribution of wild camels and wolves overlap in the nature reserve. If, however, wild camel populations concentrate in the Arjin mountain region, then more of them are likely to become the prey of wolves.

36. The above analysis can be presented in the following problem tree.

Figure 2: Problem tree for threats to wild camels and biodiversity in the region



IV. Strategy analysis

37. According to the problem tree and problem analysis provided in chapter III above, threats to the survival of wild camels come primarily from human activities within the region and unsound use of water for development outside the region. These threats have two major consequences, namely an increase in the population and the lowering of the groundwater table in the region. Strategies to combat these threats involve change in human activities within the region and modified use of water for development outside the region.

A. Changing human activities within the region

38. The question of changing human activities within the nature reserve has been thoroughly covered in project reports. The areas at issue include mining, roads, tourism and grazing, all of which involve people residing in or visiting the region. These people may well engage in illegal hunting, thus scaring away wild camels and bringing about the loss of the few remaining salt-water springs. Problems resulting from human activities mainly occur in the areas along roads, including driving paths, mining sites and a few of the springs that are close to these mining sites. Considering the vastness of the area and the low population density, human activities need not necessarily be destructive, if people could just control the kind of behaviour that might pose a threat to the survival of wild camels. The following is a list of measures that could be taken to mitigate this problem:

(a) **Public awareness**: The project has conducted many educational activities to raise public awareness. These have proved very successful, especially those targeting local communities. Given this encouraging start, more educational programmes should be created to target people likely to enter the region, i.e., persons associated with mining activities (especially miners themselves), explorers, prospectors, employees of road construction companies, tourists and farmers who graze their domestic animals in the region. The project implemented excellent educational programmes for local communities including local farmers and officials, and some of the public awareness activities were directed at the miners. In the future, there should be public awareness activities directed at explorers, road construction workers and tourists;

(b) **Mapping of all sites that have human activities and conduct of spot checks**: Experience in the Tikar checkpoint shows that it would not be very difficult to map all (or at least the most important) mining sites with assistance from the land resources and statistics departments. Accounts of wild camel sightings by miners in these sites will be of great help in understanding wild camel activities in these areas. More surveys should be conducted to identify surrounding springs wild camels at the sites and wild camel trails. To protect springs visited by wild camels, the surrounding mining sites should either be closed or put under strict controls in order to protect the wild camels. Similar actions should be taken with regard to the mapping of grazing areas and wild camel activities in these locations. The project has plans to map mining sites, but the evaluator did not see this map;

(c) **Cooperation with local government in mining planning**: It is impossible to shut down all these mining sites since they are one of the main sources of income within the local economy. It is a vast area and the impact of the mining sites is not yet measurable. The evaluator disagrees with the shutting down of mining sites as the sole way to combat threats to the wild camels, seeing this as too negative. As an alternative, the Xinjiang environmental protection bureau or the management centre of the nature reserve should cooperate with local government in mining planning. This would give the management centre a better understanding of the situation on the ground, which will in time produce better management that will be beneficial to the survival of the wild camel. When the full extent of their impact can be seen, it is possible that mines at certain key locations will have to close: the nature reserve is still very new, however, and there is little information as to how wild camels can be affected by mining activities, as far as the evaluator is aware;

(d) **Establish a reporting mechanism for people to report their sightings, illegal hunting cases and their suggestions**: Through public awareness, visitors going into the region should become familiar with the tracks and behaviour of wild camel, and become acquainted with the locations where they can report any information they want to disclose. The visitors should be involved in the surveys and monitoring activities and even in the enforcement of legislation;

(e) **Survey and monitor wolf population in the North Arjin mountain**: More information is needed on wolves and the activities of wild camels within the wolf distribution area, in order to evaluate the impact of wolves on wild camels. It is necessary to identify the situations in which and the reasons why wild camels encounter wolves. It is anticipated that wild camels may enter the wolf distribution area in search for better water resources, food and cooler temperatures. If this is the case, creating water resources (flora growth will come along when there are better water resources) further north where wolves do not reside could be a potential solution. On the whole, all these solutions related to the wolf threat should be based on a better understanding of the situation, rather than controlling the wolf population blindly.

B. Adjusting water use for development outside the region

39. There is some controversy as to whether the survival of wild camels is more threatened by the lowering of the groundwater table or the conduct of illegal hunting and mining activities. The evaluator suggests that decline in wild camel populations in the Goshun Gobi over the past ten years is primarily due to environmental degradation caused by the lowering of the groundwater table. The dramatic drop in the wild camel population would seem to support this theory (see further discussion of this issue in section C of chapter III above). Local experts hold views which differ from that of the evaluator and list human activities and illegal hunting as the predominant threats. Measures to be taken to mitigate the threat posed by the low groundwater table are as follows:

(a) **Public awareness**: The shortage of surface water in downstream areas is caused by upstream drainage of water for agricultural irrigation, city development and use in factories. The pumping of groundwater has caused a lowering of the groundwater table. All these factors result in a lower water table and the disappearance of spring sites in the region, jeopardizing the survival of wild camels, one of the most endangered big mammals in the world. Public awareness activities should target public officials in the province or even at the national level, upstream planners, high water-use sectors, such as agriculture, city construction and industry. Maintaining a necessary groundwater table should be considered. Although the project has identified a shortage of spring sites as a threat to wild camels, it failed to recognize the root cause of lower groundwater table. Consequently, it was not successful in providing public awareness to upstream areas on the proper exploitation of water resources;

(b) **Mapping and monitoring salty water spring sites**: This action is crucial to the Goshun Gobi wild camel population. The activity will not only identify whether wild camel populations in Goshun Gobi have got enough water resources, but also monitor the change in the water table. If proven that the decrease of the water table is severely threatening wild camels, pertinent action must be taken;

(c) **Large-scale planning on water use for development**: Mitigating the reduction of the water table will be extremely difficult as it involves many stakeholders on a much larger scale. The issue is not only related to the survival of an endangered species and biodiversity, but it is also heavily related to survival of downstream communities. The local communities in Nanhu and Tikar expressed the one strong wish that the government solve the problem of water supply. The local government in Nanhu has started to popularize the idea of “drip irrigation” for agriculture due to the shortage of water, but this technique needs to be applied on a much larger scale to upstream areas so as to save water for ecological use. Additional activities should be considered, for example, replacing water-demanding irrigation agriculture or industries with activities that require less water.

V. Evaluation of activities of the project

40. The Lop Nur Nature Sanctuary biodiversity conservation project commenced in March 1999, and ended in October 2002 after a 43-month duration. Under the leadership of SEPA, the project was jointly implemented by the Xinjiang EPB, the Wild Camel Protection Foundation (WCPF) and the China Environmental Journalists’ Association (CEJA) . This section of the report evaluates in detail each of the activities implemented by the project. The evaluation is based on the original plans and takes into account the problem and strategy analysis given above.

A. Establishment of the Xinjiang Lop Nur wild camel nature reserve

41. The establishment of the wild camel nature reserve has been the principal achievement of the project. Recognizing that the living environment of wild camels has been steadily deteriorating and increasingly affected by human activities, in September 1986 the government of the Xinjiang Uygur Autonomous Region approved the establishment of the (provincial level) 15,000 sq km Arjin Mountain nature reserve for the wild twin-humped camel. Under this project, on 19 May 2000, the autonomous region government extended the reserve to an area of 78,000 sq km, with the name "Arjin Mountain – Lop Nur wild camel nature reserve", which was later changed to the "Xinjiang Lop Nur wild camel nature reserve" (see figure 3, in chapter V). In 2002, the government of the autonomous region submitted an application to SEPA for upgrading the nature reserve to national level. The application was approved by the national nature reserve evaluation expert committee on 8 December 2002 and the nature reserve was upgraded to a national nature reserve in June 2003. Through this process the management has been greatly strengthened in the aspects of legislation and finance. In addition, the project significantly contributed to the whole process of enlarging and upgrading the nature reserve.

42. The setting up of a nature reserve in an area of military sensitivity cannot be compared to the establishment of a normal reserve. The problems encountered were complex and extremely sensitive. Despite protracted and persistent negotiations, the prohibited military area remains excluded from the nature reserve, as well as a large area of Lop Nur lake and its surroundings. Access to and activities within this part of the reserve without permission from the military authorities are prohibited although it seems that the prohibited military area is becoming increasingly accessible to the public (e.g., for tourism and potassium mining – as detailed in section E of chapter VIII). This area does enjoy a measure of protection, however, notwithstanding its exclusion from the nature reserve. Given that the area is an important part of the Lop Nur distribution of wild camels, the nature reserve and the prohibited military area are collectively represented as "the region" in this report, in order to consider the distribution of wild camels in the region as a whole (see figure 3, in chapter V). Many of the suggested conservation measures, for example public awareness, should be taken for the region as a whole, and not merely focused on the nature reserve.

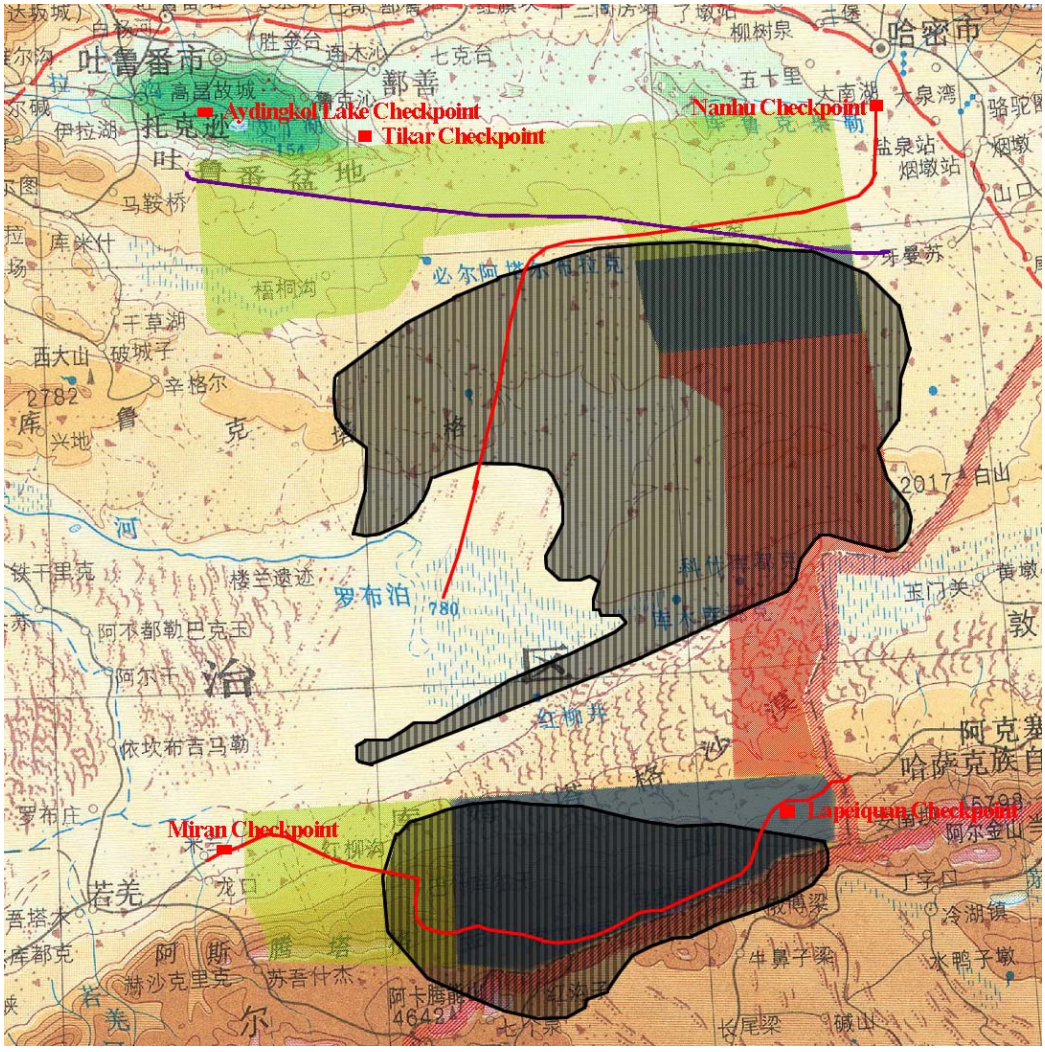


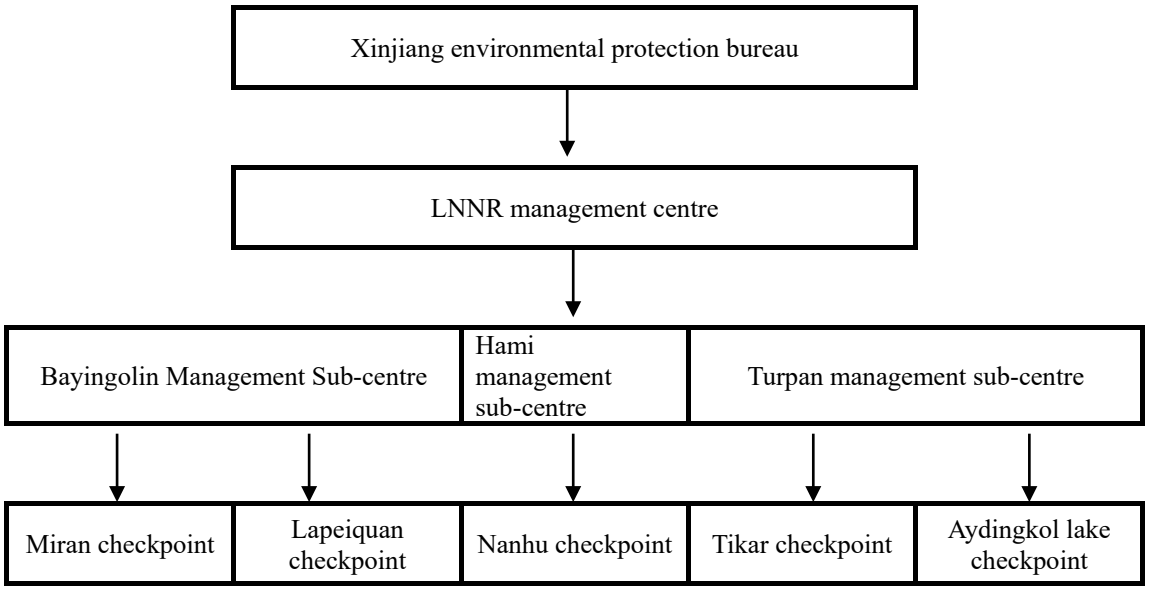
Fig 3: Xinjiang Lop Nur wild camel nature reserve and wild camel distribution in the region

Note: The green transparent color represents the experimental zones of the nature reserve, the black shading signifies the buffer zones, the red transparent is the core zone and the black stripes indicate the distribution of wild camels. The distribution of wild camels in figure 3 adheres to the findings of G.U. Jinhe et al. 1991. More recent surveys show some changes in the distribution of wild camels. For example, Lapeiquan checkpoint is now a part of the distribution area. In addition, following environmental deterioration in central Lop Nur, the distribution of wild camels has shifted to the East into Gansu province, which has better water resources. The pipeline company road (purple) at the eastern end has been redesigned and is now outside of the buffer zone. It has been suggested that the road to the potassium deposits (red in the north) will, as far as possible, be built parallel to the pipeline company road.

B. Establishment of a management system

43. A general management structure for the nature reserve has been established, under the supervision of the Xinjiang environmental protection bureau.

Fig 4: Management structure of the Xinjiang Lop Nur wild camel nature reserve



1. Establishment of the management centre

44. The management centre of Lop Nur nature reserve was established in 2000 by the government of the autonomous region. There is now a fixed fund of 325,000 yuan each year from the provincial government budget to cover staff salaries in the management centre. There are also additional operational funds from the provincial government, which vary from year to year (see the list of local matching funding in annex II for details). Staff at the management centre have a good education level. At present there are ten staff members, one graduate student, three with bachelor degrees, four with junior college degrees, one graduate from technical secondary school and one driver from high school, who are working full-time on management of the nature reserve (see annex III for more details). There are five permanent offices with a total area of 150 sq m in Urumqi, which belong to the management centre.

2. Establishment of management sub-centres

45. Under the management centre, there are three management sub-centres, which are managed by the Environmental Protection Departments in Hami city, Turpan city and Bayingolin prefecture located at the north-east, north-west and south-west corners of the nature reserve. Staffing and management resources vary greatly and mainly depend on how much support is obtained from the local environmental protection department. Hami management sub-centre has the best support from local government (Hami environmental protection department and the Nanhu local government). The local government has provided three staff who work at the sub-centre and its Nanhu checkpoint. These staff members are originally from the environment monitoring station of the Hami environmental protection department and their salaries are covered by that department. We had a meeting with all these staff-members and spent some time together during my visit in Nanhu. They came across as being highly motivated, efficient in their management of the nature reserve and fully aware of their responsibilities.

46. The Turpan management sub-centre is in poor shape. There is only one staff-member to supervise its work, but neither the staff time nor the funds are sufficient to enable him to carry out any activities. He needs more support from the Turpan environmental protection department. The situation in Bayingolin prefecture is not clear since the evaluator was unable to visit that location. From the description of the management centre, however, it does not seem to be very active at the present time.

3. Construction of checkpoints

47. Five checkpoints have been established with buildings at each site (see figure4, in chapter V). These checkpoints cover a total of 4,944 sq m, while 647.9 sq m are occupied by buildings. The staffing and management resources available vary greatly at different sites. There are three sites in the north and two in the south. The evaluator visited the three northern checkpoints.

48. The Nanhu checkpoint received the best support from local government (Hami environmental protection department and Nanhu government). It is located in Nanhu town, where living conditions are good. Trucks driving into the nature reserve for mining use another road. Three staff-members are in charge of day-to-day running of the Hami management sub-centre, and are fully funded by the government. Information and guidelines on entering the nature reserve have been distributed and a few drivers come to the checkpoint to register. Checkpoint staff believe that there are not many mining activities in the north-east part of the nature reserve closer to the checkpoint. There are about five copper-mining sites, three gold-mining sites and some iron-mining sites, employing a total of about 1,200 people. Patrols have not yet begun; the staff are mainly involved in public awareness activities, registration functions and the issuing of permits to enter the nature reserve.

49. The **Tikar checkpoint** is a good vantage point for the observation of activities within the nature reserve. It is located in Shanshan county, Turpan city, and is currently under the auspices of the Turpan environmental protection department. The director of the Shanshan environmental protection department accompanied the evaluator on his visit to the checkpoint. Members of staff from the Turpan environmental protection department have been appointed to the checkpoint. It would seem, however, from the evaluator's visit and discussions with the director of the Turpan management sub-centre and people from the Department of Statistics that they only make occasional visits and that a routine has not yet been established. The building has been rented to the Department of Statistics, several of whose officers monitor every truck carrying mining products that comes through the checkpoint day and night. This work has been going on for some time and the act of recording the output of the mining sites has led to a doubling of the tax received by Shanshan county. The staff of the Department of Statistics has estimated that there may be more than 80 active mining sites using the road in front of the checkpoint for transportation.

50. Upwards of 2,000 people live in the area of the nature reserve during summer and over 1,000 during winter. This estimate is much higher than that given by the staff of the nature reserve. The evaluator was unable to judge which of the figures was correct, but it was suggested that accurate figures could be obtained from the local Land Resources Department and the Department of Statistics. It is mainly iron, granite and gold that is mined, and the major source of labour is local, mostly from Shanshan county.

51. The **Aydingkol lake checkpoint** is located at a disused military base. This checkpoint is being built up and two members of staff from the Turpan environmental protection department have been appointed to it, although, again, a routine has not yet been established. There are few people or buildings around, although it used to be a route for mining trucks. At present, there might only be one small group of prospectors every 10 days. It is said , however, that an oil field has been found, so the road may well come back into use.

52. The **Lapeiquan checkpoint** in the south-east of the nature reserve is currently unstaffed due to the harsh conditions prevailing and its distance from residential areas. Many wild camel sightings have been made here.

53. The **Miran checkpoint** in the south-west is also unstaffed and its supervising body, the Bayingolin prefecture environmental protection department, is a long way from the checkpoint. The management centre is currently negotiating with the prefecture environmental protection department and the Ruoqiang county environmental protection department to enable the latter to take over the management of the checkpoint.

C. Purchase of vehicles

54. Four jeeps were bought using additional funds supplied by the local government. Each management centre and all three management sub-centres are now in possession of a jeep.

D. Purchase and installation of radio equipment

55. Thirteen radios have now been installed. Two were reported broken and have since been fixed, while others are working well. The annual fee for the use of a radio channel is 8,000 yuan, and staff have found that communications are poor in bad weather. The evaluator was told that, as there is at present not much field work in the nature reserve, the equipment is not being used to its full potential. When monitoring and enforcement activities increase, the equipment will be used more often. Field work for this year will focus more on the WEP road-construction programme for the region.

E. Establishment of a scientific research programme for the assessment and monitoring of endangered biodiversity

56. Scientific surveys made in 1995–2001 have gathered information on the distribution, population, migration routes, habits, diet and physiological features of wild camels in the region. The *Biodiversity Assessment Report of Xinjiang Lop Nur Wild Camel Nature Reserve* was published in 2002.

57. A management action plan for the Arjin–Lop Nur wild camel nature reserve was prepared in 2001. The action plan contains the following general list of scientific and monitoring plans, which have been assigned as the responsibility of the nature reserve:

(a) Study of the structure and function of the Lop Nur arid desert ecosystems;

(b) Assessment of biodiversity and endangered flora and fauna;

(c) Study of the impact of environmental factors on the habitat of endangered species;

(d) Study of large scale eco-environmental management;

(e) Compilation maps of the topography, physiognomy, hydrology, geology and meteorology of the nature reserve;

(f) Ecological locality monitoring of common environmental factors in the Lop Nur area;

(g) Cooperation and communication on international wildlife conservation;

(h) Study of the distribution and migration of primary protected animals;

(i) Study of the biology and propagation ecology of primary protected animals;

(j) Chemical analysis of surface water and out-flowing ground water;

(k) Study of the type and distribution of vegetation in the nature reserve NR and the primary productivity of grassland;

(l) Study of measures that would be effective in protecting and rehabilitating flora and fauna resources;

(m) Study of genetic exchanges between wild animals in the nature reserve and those in Taklamkan and the Outer Altai Gobi.

58. As the Lop Nur nature reserve is now a national nature reserve it is eligible to apply for funds from the Ministry of Finance, although this funding might not cover research costs (see section I of chapter V for details). There is as yet no specific plan for how to use the WPD funding available, but staff from the nature reserve seem to think that some of the money will be spent on surveys, monitoring and a search for salt-water springs, whereas the bulk of it will go to the construction of the WEP road. The evaluator feels that there will not be enough money to cover the above research programmes, so additional funds are requested.

59. At present these research programmes are seen as purely scientific studies; their relevance to the management of the nature reserve has not been made clear.. In order to attract funding they should be revised and offered as tools to help management in the urgent fight against the threats to biodiversity.

60. During the course of the visit the staff at the nature reserve expressed a wish for a research centre to be established. Both the evaluator and the local experts were united, however, in thinking that the nature reserve was not yet ready to invest in this kind of construction, and that it might cause problems at a future date. Many kinds of research can be carried out independently of an actual research centre, or it can be located temporarily at the management centre.

F. Preparation of public awareness programmes

61. Public awareness programmes have proved very successful. Films, publications, brochures and exhibition boards are of good quality. WCPF has played an important role in preparing materials and developing the conservation concept, and drawing international attention to wild camel conservation. Cooperation with CEJA has proved very productive in raising awareness about the importance, threats and the reasons for establishing the nature reserve in Xinjiang and, in general, for their need in China as a whole. The management centre and management sub-centres are vital connections to Xinjiang provincial and local governments and local communities. They have run several big public awareness programmes in the towns near the nature reserve. Their composition is the key to the success of the public awareness programmes. Discussions between the evaluator and local people reflected that local people have raised their understanding of protecting wild camels through these public awareness programmes. The evaluator also saw several reports about establishment of the nature reserve and protection of wild camels in newspapers or magazines published in Beijing.

62. The following public awareness materials have been produced:

Regulation of Nature Reserve Management in the People's Republic of China;
Regulation of Xinjiang Nature Reserve Management (in Uygur and Chinese);
Species List of Flora and Fauna in Xinjiang (in Uygur and Chinese);
Call of Life – the Arjin-Lop Nur Nature Reserve (film and VCD) (in Uygur and Chinese);
Notice and Guide to Entering Xinjiang Lop Nur Wild Camel Nature Reserve;
The King of the Gobi (in Uygur, Kazakh, English and Chinese);
The Fight Against Desertification (in English);
Brochure of Arjin-Lop Nur Wild Camel Nature Reserve;
20 exhibition boards;
Posters;
Programmes or news on TV, radio broadcasts, newspapers and magazines.

G. Preparation of the agenda for the international conference on trans-border issues

63. An international conference – entitled the China-Mongolia International Wild Camel Protection Conference – and workshop were held in Beijing in August 2000 and WCPF and the management centre were heavily involved in their preparation. A number of resolutions were adopted at the conference and lists of priority actions that should be taken by the Government in aspects of scientific research, management and education and awareness-raising. All these recommended actions are based on a requirement that there be an exchange of information between the two countries, China and Mongolia.

64. A letter of intent on wild Bactrian camel protection between the State Environmental Protection Administration of the People's Republic of China and the Ministry of Nature and Environment of Mongolia was signed on 29 August 2000, to initiate cooperation between China and

Mongolia at all levels on wild Bactrian camel protection and where possible to promote opportunities for a regular exchange of information between China and Mongolia, which would enable the wild Bactrian camel to be fully protected in both countries.

65. The conference has promoted joint cooperation between the Ministry of Nature and Environment of Mongolia and SEPA in China, in protection of the wild camel and its habitat. Environmental authorities from Gansu province were also invited to attend the conference, which marks the start of strengthening protection across the regions of Xinjiang and Gansu provinces.

H. Preparation of a report on the pilot scheme for environmental awareness programme

66. The report on the pilot scheme by WCPF for an environmental awareness programme is well prepared and clearly reflects the activities conducted on public awareness during the project and the impacts of these activities.

I. Sustainability of the project

67. The project has a high level of sustainability with strong support from the central, provincial and local government.

68. The Lop Nur nature reserve has been upgraded to a national nature reserve, which means that the central Government may increase its funding support for the reserve. There are a total of 226 national nature reserves in China. The Ministry of Finance provides a maximum of 30 million yuan per year for all these reserves. Each year, national nature reserves submit their proposals to the ministry and about 30–40 of them receive support of an average of 1 million yuan. Success in obtaining getting funds depends largely on the quality of the proposal and the potential of attracting international cooperation is one of the criteria applied. Usually the funds will only be provided, however, for management infrastructure development, to develop such activities as patrolling and so forth, and it does not therefore cover the routine running costs of such patrolling, or monitoring and necessary research activities. The Lop Nur nature reserve may still have to seek additional funds for its operation and research. Almost all nature reserves in China face similar problems, owing to the inappropriate funding mechanism of the nature reserve system. There is a protected areas task force under the Chinese Council for International Cooperation on Environment and Development (the evaluator is the coordinator for the task force), which is currently preparing policy recommendations, including on the financial mechanism, on a PA system for the Chinese Government. It will take time, however, to change the situation.

69. The management centre, the Hami management sub-centre and the Nanhu checkpoint all receive full support from the Xinjiang environmental protection bureau, the Hami environmental protection department and the Nanhu government (see subsections 1, 2 and 3 of chapter V, section B, for more details).

70. The establishment of other management sub-centres and checkpoints is delayed (see subsections 2 and 3 of chapter V, section B, for more details). Requests or applications for full support on staffing have been submitted, however. Since the Lop Nur nature reserve is now a national reserve, soon or later these or similar targets will be reached, as work in the reserve gathers pace.

71. The evaluator was told by the reserve staff that compensation for the WEP project is also likely to be used to support scientific studies and management activities in the nature reserve over coming years, although as yet there is no detailed budget plan.

VI. Quantitative ranking of the project

72. The success of the project implementation is rated on a scale of 1 to 5 with 1 being the highest rating and 5 the lowest. The following items are considered for rating purposes:

- Timeliness
- Attainment of outputs
- Completion of activities
- Project executed within budget
- Impact created by the project
- Sustainability

Each of the items is rated separately and then an overall rating given. The following rating system is to be applied:

1 = Excellent	(90 % – 100 % achievement)
2 = Very good	(75 % – 89 %)
3 = Good	(60 % – 74 %)
4 = Satisfactory	(50 % – 59 %)
5 = Unsatisfactory	(49 % and below)

73. Using above rating system, the evaluator rated the implementation of the project, assessed against with its logical framework/project matrix.

Table 1: Quantitative rating of the project

Project strategy	Objectively verifiable indicators	Explanation	Rating
Goal			
To conserve highly endangered globally significant biodiversity and remove root causes in the Lop Nur Sanctuary.	• A unique arid ecosystem conserved and the species that have adapted to it saved from extinction.	Establishment and upgrading of the NR, its management system and relevant legislation system, raised awareness of government and public, have certainly prevented the species from extinction. However, some major threats have still not been mitigated.	2
Objectives			
To Promote effective establishment and management of the sanctuary by providing the enabling conditions for preserving its globally significant endangered biodiversity.	• Participation in the sanctuary management and commitment of all stakeholders towards conservation of biodiversity of global significance.	Management system has been established, management measures will gradually be put in place. Involvement of local EPD and Nanhu government is successful. However, involvement of other provincial and local government departments needs to be strengthened.	3
Results (i.e., outcomes)			
(a) Establishment of a sanctuary for the preservation of the Lop Nur arid ecosystem and the species that have adapted to this ecosystem, in particular the highly endangered endemic wild Bactrian camel.	(a) Prevention of degradation of the ecosystem due to human encroachment.	Theoretically human activities have been restricted within the NR. However, coordination with other relevant government departments needs to be strengthened and larger scale planning is required to mitigate the two major threats of mining and lower groundwater table impacts.	3
(b) Implementation of the management plan of the sanctuary developed in close collaboration with local, provincial and national authorities.	(b) Increased commitment by local, provincial and national government to implement the management plan for the sanctuary.	The management plan was prepared with participation of other relevant departments however adequate coordination on the two major threats of mining and lower groundwater table has not be achieved. Implementation of the management plan is not satisfactory. The management plan needs revision	3
(c) Development of replicable models of community awareness-raising programmes in biodiversity conservation and sanctuary management.	(c) Increased cooperation between local communities and sanctuary wardens in enforcing protection measures for the wild camel.	Public awareness products and activities are very successful. Combination of efforts from Management Centre and Sub-centres, WCPF, CEJA can be served as a model to raise public awareness at local, national and international levels.	1

Activities			
(a) Sanctuary establishment components: (i) Headquarters Establishment	(a) (i) Nature Sanctuary HQ set up in Urumqi city.	The management centre has been established, with good quality staff and basic operating funds.	1
(ii) Checkpoint construction	(a) (ii) Unauthorized entry into the sanctuary effectively controlled.	Five checkpoints have been constructed. One of them has assigned full time staff with basic operational fund. However, unauthorised entry has not been effectively controlled.	3
(iii) Vehicles purchase	(a) (iii) Effective patrolling of the sanctuary.	Four jeeps suitable for Gobi's tough environment are in place. There is not much field work in the form of patrolling and monitoring yet. The Vehicles are mainly used for public awareness programmes. They will be more useful when patrolling and field monitoring start.	2
(iv) Radio communication equipment	(a) (iv) Communication between check-points and headquarters made possible.	Communication through the radio is available. Although existing ways of communication are more often used since there is little field work yet.	2
(v) Scientific research	(a).(v) Establishment of scientific research programme to monitor endangered biodiversity of the sanctuary.	Scientific research programme has been included in the management plan, although without detail specific planning. Fund for the programme has not been secured.	3
(b) Public awareness-raising component	(b) Public awareness on conservation of unique biodiversity enhanced.	Public awareness has been enhanced. More programmes should be developed targeting people who have chances to get into the region and also target people upstream at a much larger scale	1
(c) Miscellaneous project support services		UNEP has played a very good role of supervision on quality and progress of the project. FECO is the connection between international organizations (UNEP and WCPF) and the local management agencies. As a centre coordinator, it has played an important role in making sure that Environmental Department channel is straightforward. More efforts should be made to coordinate with other government departments at center government.	1
(d) Monitoring and evaluation		Monitoring and evaluations from UNEP and FECO to The Project is quite satisfactory in supervising the project progress and make adaptive management of the project.	2

Overall project rating

Evaluation parameters	Score
Timeliness	3
Attainment of outputs	2
Completion of activities	2
Project executed within cost-effectiveness of project	2
Impact created by the project	1
Sustainability	1
Overall score	2

VII. Lessons learned

74. Over three years of hard work, the project has achieved the main goals set before it. Some of the project's experiences and the lessons learned from it will be useful to other similar projects and further conservation efforts in the region.

A. Setting of a very specific objective

75. A very specific objective was set – namely, to promote the effective establishment and management of the sanctuary – and this made the project easier to operate. A considerable achievement gained with the support of the project has been the upgrading of the nature reserve from provincial to national level and its expansion from 15,000 sq km to 780,000 sq km. Although it will take some time before it is fully operational, a sound management system has been established with strong government support. Some aspects of this work have, however, been delayed (see section B of chapter V for further details).

B. Work through government channels

76. One lesson learned from the project is that it worked through government channels at national, provincial and local levels. Through the project, the management skills of a number of officers in environment departments have been enhanced. The project has secured strong government support at all these levels, although support from the Turpan and Bayingolin prefecture authorities needs to be strengthened. Without this support, it would not have been possible for the nature reserve to be upgraded to national reserve status with most staff-member on a full-time basis and local government co-funding secured. This is one of the main factors enabling the project to achieve a high degree of sustainability.

C. Public awareness practice is a good model

77. This project has carried out a great deal of work in the area of raising public awareness and attracting publicity. By yoking together local governments, the management centres, provincial environmental protection departments, CEJA and WCPF, it has been possible to raise the understanding of interest groups at international, national and local levels, and promoted awareness of the conservation of wild camels. This experience should be seen as a good model for other biodiversity conservation efforts (see section F of chapter V for more details).

D. International conservation organization involvement

78. WCPF has been heavily involved in the implementation of the project, the preparation of public awareness materials and pamphlets, the application of some counterpart funding, assisting with the establishment of checkpoints, organizing international conferences and so on. Its involvement has improved international cooperation in wild camel conservation, brought in international perspectives on nature reserves and conservation management, and made a substantial contribution to the success of the project. Its involvement can be also considered as a part of the capacity-building benefit of the project.

E. Building of a management structure underpinned by local government

79. The project has a sound management structure, under which the nature reserve's management is largely dependent on local government. The staffing and management resources available at the management centre and Nanhu checkpoint bear out this conclusion. The less than optimal situation at Turpan and Bayingolin sub-centres and their checkpoints is also a good lesson that local government support is essential for effective management of the nature reserve. The four checkpoints under the two sub-centres are far from the Turpan and Bayingolin environmental protection departments. Staff assigned by these environmental protection departments have to travel long distances to these checkpoints. The management centre has considered putting environmental protection departments which are more closely situated in charge of some checkpoints, such as the Tikar checkpoint (Shanshan environmental protection department), Miran checkpoint (Ruoqiang environmental protection department) and Lapeiquan checkpoint (Gansu environmental protection department). This should be conducive to the improved effectiveness of the three checkpoints.

F. Need for capacity-building and plans ahead of construction work

80. Buildings were put up in the five checkpoints before staff capacity and plans were ready. Local farmers have to be hired to look after buildings at these checkpoints, otherwise facilities or even windows and doors will be stolen. Aydingkol lake checkpoint was built without careful assessment and has now become an unnecessary burden. In the past, the Turpan management sub-centre hired local farmers to look after the buildings since its checkpoint is too far from the Turpan environmental protection department. Recently, they have started to instruct their own staff to call at and even stay in the checkpoint, although there is not really sufficient work to warrant this, simply because they do not have the budget to pay for a watchman. The evaluator presumes that a similar situation obtains in the Miran and Lapeiquan checkpoints, since no budget has yet been allocated for staffing and operational costs and they are in a very remote area. The nature reserve staff should learn from this experience when planning more checkpoints or a research centre.

VIII. Findings and recommendations

A. Need to develop a provincial biodiversity strategy and action plan

81. The project has tried very hard to communicate with other sectors in the province, such as the Land Resources Bureau, the Minerals Bureau and the military authorities. Their efforts have boosted the understanding by other sectors of conservation in the region. It should, however, seek more intensified inter-sectoral coordination in order to combat the major threats posed by mining activities and the lowering of the groundwater table (see sections A and C of chapter III for more details). As is the case anywhere in the world, large-scale planning is complicated by competing goals and benefits and lack of coordination. It is therefore very difficult to achieve good coordination if efforts only target the region and consideration should be given to initiatives on a broader scale such as at that of the province.

82. The evaluator recommends that work is carried out at the provincial level, while continued efforts are made to improve management in the nature reserve and to help the Xinjiang governments develop a Xinjiang biodiversity strategy and action plan. A biodiversity strategy and action plan would facilitate the development of proper regulations covering mining operations and promote the proper use of water as the obligations of the relevant sectors.

83. Since 2001, the author has been in charge of a project for the development a biodiversity of strategy and action plan for Dujiangyuan county. This project, which is funded by the United Nations Foundation, is China's first model biodiversity and strategy and action plan at the county level and it is concerned with threats to biodiversity in the entire county and the formulation of actions to combat these threats. Key to its success has been the involvement of the local government in the production of the strategy and action plan and the fact that the actions which it incorporates are related to all sectors in the county. The biodiversity strategy and action plan is at its final stage of printing and the Dujiangyuan government will adopt it as an official local government strategy and action plan. Once approved, the biodiversity strategy and action than will be integrated into the national economic and social development plans and specific plans in various government departments, such as the city plan, the environmental protection and the land use plan. It will also be implemented as part of the Dujiangyuan environmental management system, DJY ISO14000, and its actions and objectives will be incorporated into the DJY ISO14000 process as its environmental strategy, operational control and management assessment components. The relevant departments in the Dujiangyuan government have also been requested to list implementation of the biodiversity strategy and action plan in their agendas and to include it in their annual plans.

84. This experience could be taken by the Xinjiang provincial government as a model for the development of its own biodiversity strategy and action plan.

B. Need to establish an expert committee to guide nature reserve management

85. During the preparation and initial stages of the project, provincial experts in biodiversity conservation were involved in surveying and planning. During the important project implementation stage, however, it has relied on only a very limited number of such experts. This has resulted in some major disagreements among the experts, particularly those with expertise in wild camels and

biodiversity conservation, regarding certain issues such as the division of the nature reserve. Accordingly, it would be very useful to establish an expert committee comprising international, national and local experts and to make it a condition of the nature reserve's management mechanism, that the expert committee should be consulted before any major decisions are taken.

C. Need to revise the management plan

86. The management action plan for the Arjin-Lop Nur twin-humped wild camel reserve was prepared in May 2001. The following activities were listed in the management plan for 2002:

- Eradication of illegal mines;
- Placing of boundary signs and the conduct of public awareness activities among communities;
- Primary investigation of ecosystems in the nature reserve;
- Staff training for checkpoints and the management centres;
- Establishment of a scientific database for the nature reserve;
- Conduct of patrols in the nature reserve;
- Editing and printing of educational materials for public awareness.

A number of these have either not been implemented at all or have failed to obtain their expected goals. The management plan is defective in that its text does not clearly delineate any supporting actions. Furthermore, the problem analysis in the management plan is over-simplified. It fails to address such problems as the lack of coordination among different departments or to identify the limited information as one of the problems that need to be tackled.

87. The activities are listed without any indication how these are to be accomplished and what funding is available, or even whether their goals are long-term or short-term. Mining is listed as a problem, but a mere statement of undertaking to eradicate illegal mines is an inadequate response to the problem. While research on ecosystems and biodiversity is included, there is no indication how such research is to be conducted in such a large area and such difficult conditions.

88. The region covers an enormous area, straddling several ecosystems which, depending on the location, are under different threats (further details are provided in the section xxxx). Accordingly, if the management plan is to be rendered more operational, different objectives, tasks and activities should be identified for the different checkpoints.

89. In addition, the management plan does not include funds derived from compensation payments by WEP, since these were agreed on after the management plan was prepared. It is essential to ensure that these funds are properly used for their designated purpose – namely, for conservation (for further details, see chapter VIII, section E).

90. The evaluator suggests that the management plan should be revised as soon as possible, instead of in 2006, when the existing plan expires.

D. Need for more staff training

91. A few staff-members have taken training courses but, because of the short term of their recruitment, it is quite clear that staff training remains inadequate. Consideration should be given to the following training activities:

- Training in planning and environmental principles, in order to foster an environmental perception in the thinking of nature reserve staff. By incorporating environmental considerations into their thought processes, it will be easier for them to plan in accordance with environmental principles;
- Survival techniques for living in the wild. From the evaluator's conversations with staff-members, it appeared that they were afraid of travelling in the region. There have been cases where people have died because they got lost or their cars broke down. Without the necessary survival training, staff should not be allowed to conduct patrols in the nature reserve;

- Monitoring procedures and skills. The inability to identify wild animals and plants is indispensable. A simple identification booklet on the flora and fauna of the region should be prepared and staff should be trained in their identification. In comparison to the situation in forest reserves, which have thousands of species, such a booklet will not be difficult to prepare for this reserve, since it has only a few hundred different species. Monitoring is not viable if it can only be carried out by experts;
- Training courses for nature reserves currently being conducted by SEPA and the State Forestry Administration mainly target small-scale nature reserves with a much lower level of biodiversity and pressures from the surrounding population. Staff-members need to visit other nature reserves which are more comparable to the Lop Nur reserve and to gain more experience in the management of such large reserves. For example, they should visit the Great Gobi reserve in Mongolia, to draw on its experience of the management of wild camels. WCPF is working on this idea;
- Field training should be arranged for all staff members. To the best of the evaluator's knowledge, only one staff member has actually travelled into the nature reserve during a survey exercise; none of the others have had the opportunity to enter the reserve or to gain familiarity with the field environment in the reserve.

E. Need to assess potential threats from potassium mining

92. The potassium deposits in Lop Nur lake within the prohibited military area, which are estimated at 299 million tons, are believed to be the largest in Asia. The expected economic output from these deposits is 50 billion yuan. Development work on the deposits started in 2000 (see the Gazette of the People's Political Consultation, 2002). A new road will run west from Hami, crossing the northern experimental reserve and then turning south and running as far as the centre of the lake (see figure 3 in chapter V, section A). It is planned that the operation will yield 200,000 tons of potassium sulphate in 2004, 1.2 million tons in 2007 and 2.2 million tons in 2010. After five years, there will be a group of potassium pools stretching over 100 square kilometres in Lop Nur lake (Gazette of the People's Political Consultation, 2002). A freshwater well has been sunk in the Archik valley, to a depth of 465 metres and capable of providing 452.5 cubic metres of drinking quality freshwater daily. It is considered that this, together with another freshwater well, will be able to meet the demands posed by the potassium operation. A new township in Lop Nur was officially established in January 2002 and its first inhabitants arrived in 2001 – over 200 workers. It is plan to develop the township into an industrialized small modern town, combining the functions of industry, mining and tourism (Xinhua.net, 15 January 2003).

93. A canal has been developed, 12 kilometres long, 40 metres wide at the top and 20 metres wide at the bottom. Saltwater with a saline concentration of 35 per cent is pumped from underground and transported to the potassium pools via a canal. Potassium sulphate is produced from the saltwater in these pools through the process of evaporation (People.net, 18 February 2002).

A canal, 12 kilometres long, 40 metres wide at the top and 20 metres wide at the bottom, has recently been dug (People.net, 18 February 2002)

94. Although the mining site lies outside the nature reserve and is not in an area where there is a high population density of wild camels, the routing of roads across their distribution areas and the diversion of groundwater will without any doubt pose a seriou threats to the survival of the wild camels. The assessment of such threats and work to monitor changes brought about by the potassium mining operation should form part of the nature reserve management strategy.

95. It is difficult for the nature reserve to do anything to combat this threat, since the operation is situated in the prohibited military area. This is another reason why it is so important for Xinjiang to have a biodiversity in strategy and action plan. While it may be impossible to stop the mining operation, the nature reserve staff must find ways of getting involved in its planning and to reduce its impact on the survival of wild camels and local biodiversity.

F. Need to ensure that proper use is made of the compensation from the West-East pipeline project

96. The West-East pipeline project (WEP) is an integrated upstream, midstream and downstream project for the transport of gas from the west to the east of China. The gas will be transported via 3,100 kilometre pipeline from the Tarim basin in Xinjiang to Shanghai and will cross right through the northern experimental zone of the nature reserve (see figure 2 in chapter V, section A). The pipeline has a 40 inch diameter and is flanked by a permanent 30-metre wide company road, which will give access to the habitats of wild camels. Construction work started on 15 March in Hami, while the evaluator was on his visit to Xinjiang. The section within the nature reserve is to be completed by August 2003.

97. A large sum in compensation for this work is being provided by WEP. According to the relevant agreement, this compensation may only be used for conservation work within the nature reserve. The evaluator was not shown any plan of how these funds are to be used. It is important that the budget for this purpose is included in the management plan and that this is done immediately, to ensure that proper use is made of these funds (for more details, see section C of chapter VIII).

G. Need to strengthen scientific surveying and monitoring

98. Some surveys have been conducted by the survey team but this team only included one staff-member from the nature reserve itself. More detailed scientific plans should be prepared (see chapter V, section E, above for further details), and preparations and training should be conducted before any real survey can be carried out (see section D of chapter VIII for more details).

99. Although funding to the nature reserve is increasing, this does not include funds securely earmarked for research and monitoring. Funding resources for research and monitoring should be clearly indicated in the revised management plan (see chapters V, section E, and VII, section C, for more details). During the evaluation trip, the evaluator felt that the importance of conducting scientific surveys was not fully recognized. Owing to lack of information, there was no clear perception of threats: scientific surveys and monitoring are needed to identify threats and to take the necessary action to mitigate their impacts.

100. Access to the nature reserve is very difficult and scientific survey work should therefore be closely combined with patrols to saltwater spring sites. Project staff should also take advantage of any opportunity that might arise to travel into the nature reserve, for example, by travelling with mining trucks, exploration teams or tourist groups.

101. In order to gain and overall understanding of the biodiversity situation, teams have to penetrate deep into the nature reserve. Cooperation with the military authorities in the use of their aircraft and other military equipment should be seriously pursued – this possibility has already been mentioned by the director of the management centre. Hiring aircraft, pilots and equipment is an expensive procedure but it is still cheaper, safer and likely to be more productive than trying to drive to the centre of the nature reserve. The use of military aircraft will also make it possible to obtain aerial photos. The evaluator made a short visit to the GIS lab of the Xinjiang environmental monitoring centre. It has basic capacity in GIS technology and methods, but more training is needed

in this area. Aircraft could also drop a team in a locality and then come back a few days later to pick them up. The team could conduct detailed surveys of flora and fauna in their natural surroundings.

H. Need to improve checkpoints and patrolling

102. Compared to the management centre and at the Nanhu checkpoint, which are both reasonably active, none of the other four checkpoints can be considered fully operational (for further details on this, see subsection 3, of chapter V, section B).

103. As yet, there is still no effective control of unauthorized access. In fact, there are only three full-time staff-members in place at any of these checkpoints – and they are all deployed at the Nanhu checkpoint. This checkpoint is not located along the route taken by mining operations and checkpoint staff only make sporadic checks along the tracks leading to mining areas. Tikar checkpoint would be the best checkpoint to control access to mining areas and to gather operation on such movements; owing, however, to the lack of support from the Turpan environmental protection department, management at that checkpoint has been very weak (for more details on this, see subsection 3 of chapter V, section B, and section E of chapter chapter VII). If the capacity of local government is strengthened, the evaluator believes, on the basis of his visit to the checkpoint and discussions with the director of Shanshan county environmental protection bureau and local inhabitants, that this checkpoint will undoubtedly become the most effective control point. Miran could also serve a similar function, as indicated to the evaluator by nature reserve staff-members (see subsection 3 of chapter V, section B, and section E of chapter VII, for more details).

104. As yet, there is no patrolling at any of these checkpoints. The main reason for this is that the nature reserve has not obtained permission from the law enforcement authorities for the conduct of patrols, added to which the environment is too harsh and the distances too great for any effective patrolling. Currently, the management centre is completing the formalities necessary to obtain the permission of the law enforcement authorities. In addition, staff-members lack the necessary field experience to conduct patrols in these difficult conditions (see chapter VIII, section D, for more details).

105. The WEP company road and the road to the potassium mines (see figure 3, in chapter V) are posing further challenges to the effectiveness of the three northern checkpoints.

106. There is a need to develop a comprehensive plan as an indispensable component of the management plan, so as to enhance the effectiveness of existing checkpoints and patrols (see section C of chapter VIII for more details). It would be helpful to assign different priorities and tasks to different checkpoints, to cater for the different conditions and needs.

Annex I

Terms of reference of the evaluation

The evaluator shall:

(a) Assess the overall appropriateness of the objectives of the project to the pertinent UNEP, mission, mandate and subprogramme objective;

(b) Establish to what extent the project's objectives were met and planned results obtained, taking into accounts the indicators listed in the project document (see Annex) and whether it has been a cost-effective way of obtaining these results, particularly focusing on:
- The actual process of establishing the reserve and the utility of the established checkpoints, headquarters, staffing, use of vehicles, and radio equipment;
- The manner in which the management plan for the reserve was developed and its subsequent usefulness;
- The relationship between the original project site for the reserve and the contiguous 15,125 sq km of Arjin reserve to the west, which was established in 1986;
- The approaches developed and utilised to address threats to biodiversity in the reserve including poaching, grazing of domestic animals, current and/or planned economic development in the province, which may affect the reserve such as resettlement, gold, copper, leopoldite and salt mining, new roads, the gas pipeline, decreasing water flow, and the usefulness of approaches;

(c) Determine the quality and usefulness of the project's outputs and activities, in particular:
- The scientific research programme in the conservation of biodiversity in the sanctuary;
- The training programme conducted for the management of the reserve. In answering this question, the selection of participants who benefited from the training should be looked into;
- The communication and awareness raising strategy and activities, and their impact on the conservation of biodiversity in the sanctuary;

(d) Review the effectiveness of the institutional structure, management and financial systems, and assess the staffing, administrative arrangements and operational mechanisms;

(e) Assess the effectiveness of technical, administrative and financial support provided by UNEP and GEF;

(f) Determine the sustainability of the planned financial strategy and approach put in place by the government to handle recurrent financing for the sanctuary;

(g) Identify problems encountered, good practices and lessons learned during project implementation, in particular with regards to the establishment of the sanctuary and awareness-raising;

(h) Provide recommendations on how to improve future delivery at policy and project levels.

Annex II

Matching funds for the project

List of local matching funds (Unit: 10,000 yuan)

Serial No.	Name of item	Amount	Unit price	Sum	Source	Note
I.	**Purchasing facilities and equipment**			**63.45**		
1	Jeeps for monitoring, research and patrolling	4	12	48.0	government and environment	80000/car, additional fee 40000/car
2	PC	3	1	3.0	SEPA	
3	Notebook PC	1	2.2	2.2	SEPA	
4	Office equipment	14 sets	0.75	8.25	SEPA	Desks, chairs and etc.
5	Printer	1	0.5	0.5	SEPA	
6	Deed box	5	0.3	1.5	SEPA	
II.	**Necessary capital for infrastructure**			**30.0**		
1	Expense on the construction of Checkpoints	5	4	20.0	Government	Return the debt for the construction of Checkpoints
2	Land use cost of Checkpoints	5000 ㎡	2	10.0	Government	Land use fee is exempted
III.	**Expenses on public education and training**			**8.0**		
1	Fund for printing of materials of public education	5.0	Enterprises	Printing 160000 pieces of paper		
2	Training fee	3.0	SEPA	3 times of training		
IV.	**Others**			**78.5**		
1	Fund for special use	20.0	Government	Fund for printing, preparation of upgrading materials for nature reserves, employing experts		
2	Personnel wages	32.5	Government			
3	Outlay for launching	26.0	SEPA			
	Sum			**1,799,500yuan ($217,857)**		

Counterpart funding

Serial No.	Name of item	Amount	Unit price	Sum	Source
1	Four-wheel drive Toyota vehicle	1	($20,000)	$20,000	Kadoorie Foundation of Hong Kong
2	Construction of Tikar and Aydingkol Lake checkpoints	2	$20,000	$40,000	Robert Schad Foundation of Canada
3	Contribution of radio and communications equipment		$85,000	$85,000	a subsidiary company of the British company Cable and Wireless
4	Radio and communications equipment installation		$20,000	$20,000	WCPF raised
	Total			**$165,000**	

Annex III

Staff of the Xinjiang Lop Nur wild camel nature reserve

Working unit	Name	Sex	Nationality	Post	Age	Years of work	Educational background	Graduation university	Specialty	Time of graduation
Management Centre of the Nature Reserve	1. Zhang Yongshan	Male	Han	Director	48	29	Junior college	Xinjiang Training Centre of Finance and Accounting	Finance and accounting	1997.01
	2. Zhang Yu	Male	Han	Deputy Director	38	16	University	Lanzhou University	Zoology	1987.07
	3. Zhang Chao	Male	Han	Engineer	42	22	Junior college	Qinhuangdao Environment College	Environmental information	1988.07
	4. Yuan Lei	Male	Han	Engineer	33	13	Graduate student	Xinjiang University	Natural geology	2000.07
	5. Gao Lijun	Female	Han	Assistant	36	16	Junior college	Qinhuangdao Environment College	Environmental information	1997.07
	6. Sagen Guli	Female	Kazak	Assistant	28	4	University	Chongqing University	Environmental engineering	1999.06
	7. Xie Zhengjun	Male	Han		27	2	Junior college	Xinjiang School of Public Relation	Public Relation	1996.07
	8. Su Lidan	Male	Kazak		28	6	Technical secondary school	Wushi Finance and Trade School	Business Administration	1996.7
	9. Gui Shengjun	Male	Han	Driver	33	14	Senior high school			
	10. Shala	Female	Kazak	Engineer	37	16	University	Beijing Business Administration College	Business Administration	1987.07
Hami Management Sub-centre	11. Gao Yunxiao	Male	Han	Director	42	20	University	Xinjiang University	Aquatic geology	1983.7
	12. Xie Zhihao	Male	Han	Section member	39	20	Senior high school			
	13. Yu Fachang	Male	Han	Section member	26	8	Technical secondary school	Shanghai TV and Broadcasting School	Marketing	1995.7

Bayingolin Management Sub-centre	14. Tasimu	Male	Uygur	Section member	33	15	Junior college	Xinjiang University	Biology	
Turpan Management Sub-centre	15. Wu Xinjian	Male	Han	Director	46	28	Senior high school			

Annex IV

Bibliography

GU Jinghe, GAO Xingyi and ZHOU Jiadi, 1991. Status and distribution of wild two-humped camel in Xinjiang. *Studies on the animals in Xinjiang*. Beijing: Science Press. 1-9.

YUAN Guoying (ed.) 2002. *Comprehensive survey report of Arjin-Lop Nur Wild Two-humped Camel Nature Reserve*. Unpublished.

GU Jinghe and GAO Xingyi. 1987. Wild Two-humped Camels in Lop Nur Region. In: *Scientific Survey and Research of Lop Nur*. Beijing, Science Press. 218–225.

ZHENG Changlin, 1998. *Camelus bactrianus*. In: Red Data Book of Chinese Endangered Animals (WANG S. ed.). Beijing, Science Press. 225–228.

ALLEN, G.M. 1940. Mammals of China and Mongolia. American Museum of Natural History, New York. pp.

WANG, S. 1964. *Camelus bactrianus*. In: Birds and Mammals of Southern Xinjiang (QIAN Y-W. ed. Science Press, Beijing.

Record of people's political consultation. 10 September 2002. Introduction to Bayingolin Prefecture, Xinjiang.

Xinhua Net, 2002/01/15. http://news.163.com/editor/020115/020115_334093.html

People Net, 2002/02/18. http://news.163.com/editor/020218/020218_355013.html

Annex V

List of people visited during the evaluation

Name	Organization/unit	Title
Zhang Yongshan	Management Centre of LNNR	Director, all trips and meetings in Shanshan, Hami, and Nanhu
Zhang Yu	Management Centre of LNNR	Deputy Director, during the meeting with Xinjiang EPB meeting and expert meeting in Urumqi
Sha La	Management Centre of LNNR	Staff, all trips and meetings in Xinjiang
Shagen Guli	Management Centre of LNNR	Staff, all trips and meetings in Shanshan, Hami, and Nanhu
Su Lidan	Management Centre of LNNR	Staff, all trips and meetings in Shanshan, Hami, and Nanhu
Yuan Lei	Management Centre of LNNR	Deputy Director, in the expert meeting in Urumqi
Gu Jinghe	Xinjiang Institute of Biology, Soil and Desert, CAS	Mammalogist, in the expert meeting in Urumqi, and telephone review
Gao Xingyi	Institute of Xinjiang Geography, CAS	Mammalogist and Ornithologist, in the expert meeting in Urumqi
Yuan Guoying	Xinjiang Institute of Environmental Protection	Mammalogist, in the expert meeting in Urumqi
Li Weidong	Xinjiang Institute of Environmental Protection	Mammalogist, in the expert meeting in Urumqi and telephone review
Ma Ming	Xinjiang Institute of Biology, Soil and Desert, CAS	Ornithologist, in the expert meeting in Urumqi
Mr. Wei	Xinjiang EPB	Director, in the meeting with Xinjiang EPB
Anonymous	Xinjiang EPB	Director of Communist Party, in the meeting with Xinjiang EPB
LI Xinhua and other two staff	Division of Natural Ecology, XEPB	Director and staff, in the meeting with Xinjiang EPB
Zhang Xintang	Hami EPB	Director, two dinners together
Gao Yunxiao	Hami Check-Point	Director, during trip in Hami and Nanhu Checkpoint
Xie Zhihao	Hami Check-Point	Staff, during trip in Hami and Nanhu Checkpoint
Yu Fachang	Hami Check-Point	Staff, during trip in Hami and Nanhu Checkpoint
Mr. Sai	Nanhu Town	Director, in the meeting with Nanhu Officers
Mr. Huang	Nanhu Town	Deputy Director of the Communist Party, in the meeting with Nanhu Officers
Mr. Chen	Nanhu Town	Deputy Director, in the meeting with Nanhu Officers
Mr. Wang	Nanhu Town	Director of Police Station, in the meeting with Nanhu Officers
Five senior local farmers (41, 60, 64, 50, 82 years old)	Three different places in Nanhu Town	Local farmers, during meetings with local communities
Yang Zhenchuan	Shanshan County EPD	Director, in the meeting with Shanshan EPD and trip to Tikar Checkpoint
Wu Xinjian	Turpan Management Sub-centre	Director, trip to Tikar and Aydingkol Lake Checkpoint
4 Anonymous	Tikar Checkpoint	Two staff and one officer of Statistics Department, and one old local farm
Anonymous	Aydingkol Lake Checkpoint	Local farmer, trip in Aydingkol Lake
Zhu Jiang	Institute of Zoology, CAS	Team leader of the Self-evaluation, in the interview in IOZ, and provide relevant documents and materials he has from his evaluation.
Anonymous	Xinjiang Environmental Monitoring Centre Station	In the short visit to GIS lab in the Xinjiang Environmental Monitoring Centre Station
John Hare	WCPF	Director, review on draft evaluation paper
Sheila Aggarwal-kwal	UNEP	Task Manager, sending all relevant documents and email communication
Sheila Aggarwal-kwal	UNEP	Task Manager, sending all relevant documents and email communication, and draft review.
Zhu Guangqing	Ecological Protection Division, SEPA	Officer of SEPA, telephone interview
Tao Siming	Ecological Protection Division, SEPA	Officer of SEPA, telephone interview
Wang Yexu	FECO, SEPA	Project Officer, draft review and telephone interview
Sheng Guijun	Management Centre	Driver, trips to Shanshan, Hami and Nanhu
Mr. Zhang	Xinjiang EPB	Driver, all field trips

Annex VI

Evaluation itinerary and activities

	Dates	Activities summary
1	12 March	Talk with Zhu Jiang, team leader of last project evaluation team, and get documents he got from his review. Read relevant papers. Prepare for trip to Urumqi.
2	13 March	Morning: Arrive Urumqi. Meet with Zhang Yongshan, Director of the NR at the airport. Visit office of the NR centre and drive to Shanshan county of Turpan in the afternoon together with Zhang Yongshan, 3 other staff-members from headquarter and two drivers. Meet with Director and Secretary of Shanshan County Environment Bureau. Stay in the county overnight
3	14 March	Morning drive to Hami and arrive at 13:30. Afternoon proceed to Nanhu Township and meet Director, Deputy Director, and Secretary of the township government, the Director of Police for the township and all staff-members (three) of the management sub-centre. Meeting is over at 18:30; then drive south for 40 minutes and see the north of the NR (still about 20 minutes away from the NR). Stay in Hami overnight.
4	15 March	Morning drive to Nanhu township together with 2 staff-members from headquarters, 1 from sub-centre, Deputy Director of Nanhu township government, and visit two village families. Discuss with 2 senior villagers over 80, 6 over 60 and 1 over 50 about environmental changes in Nanhu and NR region. Afternoon, visit ostrich breeding farm. Stay in Hami overnight.
5	16 March	Morning drive back to Shanshan county with Sara (staff-member from headquarters). Rest of the team conduct public awareness in Nanhu township. Meet Director and Deputy Director of Environment Protection Bureau of Shanshan county and Director of the Turpan management sub-centre. In the afternoon, visit Tikar checkpoint together with the Director of Shanshan EPB and the Director of the Turpan management sub-centre. Interview with staff-members from Statistics Department who are logging mining products passing through the checkpoint, and local people about mining activities and other relevant issues. Stay in Turpan overnight.
6	17 March	Morning drive to Aydingkol lake checkpoint together with Director of Turpan management sub-centre. Nobody found in the building. Talk with military about transportation through the checkpoint, wildlife found around and land degradation. Visit Kan'erjin, one of the three biggest water resource projects in the history of China. Afternoon drive back to Urumqi and stay in Urumqi overnight
7	18 March	Morning meet with Deputy Director of headquarters and discuss project issues. Meet Director, Secretary and three other staff-members of Xinjiang EPB. The director explains the whole process of the project, problems, and future of the project. Afternoon, short visit to the Environmental Monitoring entre Station of Xinjiang EPB and check its GIS capability. Meet 5 experts (Gu Jinghe, Gao Xingyi, Yuan Guoying, Li Weidong and Ma Ming) from Environment Protection Institute and Xinjiang Geography Institute, CAS and three staff-members of headquarters. Main discussion topics are threats to the NR, strategies to combat these threats, and effectiveness of activities conducted under the project to address these threats.
8	19 March	Leave Urumqi and fly to Chengdu, Sichuan Province. Read documents collected during the trip.
9	23 April	Read materials
10	24 April	Prepare draft paper
11	29 April	Prepare draft paper
12	30 April	Prepare draft paper
13	1 May	Prepare draft paper
14	2 May	Prepare draft paper
15	3 May	Prepare draft paper
16	4 May	Prepare draft paper
17	5 May	Prepare draft paper
18	6 May	Prepare draft paper
19	7 May	Prepare draft paper
20	28 July	Review paper following comments
21	29 July	Review paper following comments
22	1 August	Review paper following comments
23	2 July	Review paper following comments
24	3 July	Review paper following comments
25	12 Oct.	Finalize paper