

Conservation of Sulaiman Markhor and Afghan Urial by Local Tribesmen in Torghar, Pakistan

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Torghar lies in the district of Killa Saifullah within the province of Balochistan, Pakistan. The Pathan tribe, the largest of the Kakar group, have been living in this area for several generations. Several sub-tribes exist for whom hunting is a tradition. Before the Afghanistan War began in 1979, primitive weapons and the scarcity of ammunition limited the number of animals killed. As the pace of the war increased, automatic weapons and ammunition became readily available. Seasonal migrants and local residents began hunting indiscriminately and population numbers of wild animals dwindled rapidly. Populations of Sulaiman Markhor (*Capra falconeri jerdoni*) and Afghan Urial (*Ovis orientalis cycleros*) – keystone species in the area – became critically low. In 1984, representatives of the United States Fish and Wildlife Service (USFWS) arrived in Balochistan to explore opportunities for wildlife conservation. Tribesmen from Torghar expressed an interest in wildlife conservation and a self-supporting conservation programme was established: The Torghar Conservation Programme (TCP), later the Society for Torghar Environmental Protection (STEP), whose design was based on the principles of sustainable use, local tribe involvement, and conservation biology. Today the numbers of Sulaiman Markhor and Afghan Urial have increased significantly. The capacities of local tribes have also increased and the economic and social infrastructure of the area has developed positively. This paper describes the events that led to the creation of STEP, its achievements, and outlines its future plans. The paper demonstrates that by involving local communities in conservation projects, both wildlife and communities benefit.

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1. Introduction

The wilderness area of northeastern Balochistan has long been famous for its abundant and diverse wildlife. Large populations of Sulaiman Markhor also known as Straight Horned Markhor (*Capra falconeri jerdoni*) and Afghan Urial (*Ovis orientalis cycleros*) were once found here, as were leopards and black bears. For the local people of this area – the Pathans – hunting for sport, meat, and skins is a traditional pastime. Before the Afghanistan War began in 1979 only a small number of animals were hunted as the weapons used were primitive and ammunition was both scarce and expensive. The war led to an increase in the number and type of weapons used (specifically semi- and fully-automatic rifles) and seasonal migrants and local residents began hunting indiscriminately; animals of all ages and both sexes were killed and wildlife populations dwindled throughout northeastern Balochistan.

Torghar lies in the Zhob area of Balochistan and was an important habitat of Sulaiman Markhor and Afghan Urial. Population numbers of these species were also reduced to critical levels through indiscriminate hunting. In an attempt to reverse the rapid decline of population numbers, local tribal leaders and tribesmen agreed on an area-/species-wide hunting ban and in 1984, with technical assistance from the US Fish and Wildlife Service, established the Torghar Conservation Programme (TCP). In April 1994, the Torghar Conservation Programme became a non-governmental organization (NGO): The Society for Torghar Environmental Protection (STEP). STEP was registered in Balochistan as a non-profit conservation programme.

STEP operates as a self-supporting project using the revenues from trophy hunting as operating funds. Despite the difficulties posed by government hunting policies and laws and problems in gaining permission to export trophies, the TCP continues to benefit wildlife and local communities within northeastern Balochistan by incorporating the principles of sustainable use, local tribe involvement, and conservation biology. Although the focus of the programme has been the conservation of Sulaiman Markhor and Afghan Urial – two keystone species in the area – conservation efforts have also led to the restoration of the local habitat.

2. Torghar

2.1. Geography

Torghar lies in the district of Killa Saifullah within the province of Balochistan, Pakistan. It forms the northernmost part of the Toba Kakar Range, a chain of rugged sandstone mountains. Altitude varies between 2,500-3,300m. The climate is characterized by strong seasonality both in temperature and precipitation. Summers are hot and temperatures often rise to 35⁰C. Winters are cold with temperatures falling as low as minus 15⁰C. There is a strong variation between day and night temperatures. The average annual precipitation is about 200-250mm that falls mostly in March and April as snow, with some summer rainfall in July and August.

2.2. Culture and History

Zhob is believed to be the cradle of the Pathan race. Pathans speak Pushtu and call themselves Pushtun. Their Persian, Baluch, and Central Asian neighbors refer to them as Afghans whilst to the peoples of the Indian sub-continent and the west they are Pathans. Pathans are divided into many tribes and sub-tribes. The largest tribe in the area is the Kakar tribe and is distributed throughout Pakistan and Afghanistan. The culture, language, and religion of the people of the Zhob region are the same as those of the people of the neighboring North West Frontier Province (NWFP) and Afghanistan.

The people of Torghar are Pathans of the Kakar tribe. They are divided into two principal sub-tribes: The Sanzar Khail and the Sanatya. The Sanzar Khail sub-tribe is further divided into the Jalazai, Mardanzai and Abdullazai. The Jalalzai are divided into a number of sub-tribes also, of these the Khudzai, Mirozai, Shabozai, Shahizai, Hakimzai, and Mehmanzai are found in Torghar. All tribes are clearly distinguished by their clothing

and jewelry. Almost every adult male carries a gun and they are excellent marksmen and hunters. From before the outbreak of the British-Afghanistan war in 1878, until the region was conquered by the British in 1884, the Jogezi family of the Zhob Kakars exercised chief authority over the Kakar tribes of the Zhob region and Bori Valley area and the adjoining districts of Kach and Kowas. Between 1878 and 1884, the local Kakars conducted a guerilla war against the British. A military expedition was launched against the Kakars in October 1884 and Zhob became part of the British Indian Empire. By the late 19th Century the British had subjugated the entire sub-continent of Asia.

2.3. Flora and Fauna

Steppe-type vegetation characterizes Torghar and varies with elevation and soil type. Lower slopes (1,000-2,000m) have largely been denuded of trees and the few that remain are widely distributed and are primarily wild pistachio (*Pistacia khinjuk*), juniper (*Junipers excelsa*), and ash (*Fraxinus xanthoxyloides*). Tamarisk (*Tamarix* sp.) grows along streambeds. Overgrazing of the valleys has led to the establishment of xerophytic scrub vegetation dominated by *Acacia*, *Artemisia*, *Haloxydon*, and *Rosa* species. Bunch grasses still remain in rugged mountainous areas where grazing pressure is lower. Sulaiman Markhor (*Capra falconeri jerdoni*), also known as the Straight Horned Markhor, and Afghan Urial (*Ovis orientalis cycloceros*), wolves (*Canis lupus*), Pallas's Cat (*Felis manul*), Steppe Wild Cat (*Felis silvestris ornata*), and many small mammals, especially the Afghan Mole Vole (*Ellobius fuscocapillus*) have been recorded in the area. Over 75 bird species have been recorded, and many of these breed in Torghar.

2.4. Land Tenure

The total population of Torghar is about 4,000 people. The principal settlements are Tanishpa, Kundra, Khaisore, Tor Gh'berg, and Tubli. Individual residences are scattered throughout the area. The largest village is Tanishpa with nearly 25 households. Sub-tribes exercise control over a well-defined area, with mountain ridges usually defining the boundaries. Agricultural land is under family ownership.

2.5. Local Economy

The people of Torghar are semi-nomadic. They are extremely poor and their subsistence depends on herding large flocks of sheep and goats. There are virtually no sources of permanent or seasonal employment in Torghar. Most people have permanent homes within settlements, where some family members live year-round while others move seasonally with the herds.

Sheep and goat flock sizes vary according to the season. Grazing pressure, especially in the lower slopes and valleys, increases during livestock movement. Good range conditions exist at higher elevations. The livestock and wild ungulate populations are currently increasing in number leading to increased competition for resources. This is a matter of concern both for the local people and STEP.

Available agricultural land is limited to the valley floors, mainly in Tanishpa where adequate level ground and water for irrigation exists. Cereal crops and fruits are harvested here, e.g., apples, almonds, apricots, and mulberries. Tribal people supplement their diet and income by eating and selling wild produce, e.g., wild pistachios, resin, and many different herbs and medicinal plants. Before STEP the elected parliamentarians helped local people to develop more land for agriculture by providing them with bulldozers with which they leveled uneven ground for agriculture. In contrast, STEP believes that land development could result in fragmentation of the wildlife habitat. Since its inception STEP has been successful in halting further land development.

Dead wood and tree branches are the main sources of fuel and local communities do not allow any fuelwood or timber to be sold. There is a total ban on cutting pistachio trees due to the importance of wild pistachio in the local economy.

Torghar encompasses one of the traditional migration routes that is used by a number of Pathan tribes who move between the Afghan plains where they spend the summer, and the Indus Valley of Punjab and Sind Provinces where they winter. Nearly 20 tribal groups use this route twice a year. In early spring these tribes travel north to Kakar Khorasan and beyond the Durand Line into Afghanistan where they spend the summer in their own tribal territories. This biannual passage comprising thousands of tribesmen and their livestock has caused severe natural resource degradation along the migration path. Wood is cut for fuel and wildlife of all sizes is hunted. STEP, at the request of Torghar people, gained an agreement from the Pathan tribes that they would not hunt in the area.

3. The Torghar Conservation Programme

Hunting for sport, meat, and skins has always been a strong tribal tradition. In the past, hunters were few, the weapons primitive, and ammunition expensive. Hunting never posed a serious threat to wildlife. The outbreak of the Afghanistan war in the late 1970s altered the local arms market: Automatic weapons became easily available and ‘trigger-happy’ hunters and soldiers killed females, young, and even non-game species indiscriminately. The wildlife numbers in Pakistan as a whole and in Torghar in particular declined rapidly. By the early 1980s the population of Markhor and Urial had reached a critical level.

The decrease in wild ungulates resulted in a shift in predator-prey dynamics and domestic livestock became prey for leopards. Tribes responded by extirpating the leopard from the area. Weak institutional capacity and difficulties in law enforcement within tribal areas coupled with a lack of will on the part of enforcers, meant that the government agencies were unable to save the vanishing wildlife.

Although the concerns over rapid losses of wildlife continued to grow during the mid-1980s, no serious effort was made to remedy the situation. It was at this time that one man, the late Taimur Shah Jogazai (Nawab of Kakar Tribe), an ardent nature lover who had traditional authority over the local tribesmen, issued a tribal decree banning hunting in the Kakar tribal areas. Unfortunately Nawab Jogazai had no means with which to enforce the ban and twice petitioned the provincial Government of Balochistan (GoB) for assistance but to no avail.

In early 1984, Naseer Tareen, a tribesman and a professional filmmaker, was commissioned by the GoB to make a film on the wildlife of Balochistan. Unaware of the wildlife situation in Balochistan, and assured by the GoB officials that wildlife was plentiful and that he would have no problems finding subject material, Tareen and his team set out to shoot the film. After spending one week in Torghar, one of the best known areas at that time for Sulaiman Markhor and Afghan Urial, they spotted only one female Markhor and three Urial. The team then went to other mountain areas in Balochistan known to have had good Sulaiman Markhor populations, but in these areas too the Sulaiman Markhor populations had declined to such an extent that Tareen’s team could not shoot the film.

3.1. External Involvement

Taimur Shah Jogazai remained unsuccessful in his attempts to gain assistance from the GoB and asked Naseer Tareen to use his connections to halt the degradation of the wildlife. During this time Steve Landfried, a crane conservationist, was visiting Pakistan and Tareen discussed with him the wildlife conservation issues in Balochistan. Landfried advised Tareen to request United States Fish and Wildlife Service (USFWS) assistance. At that time the USFWS was already supporting a number of wildlife conservation initiatives in Pakistan.

In June 1984, Naseer Tareen met with David Ferguson (then-Head of USFWS International Programmes) in Washington D.C. and solicited USFWS’s help in the conservation of wildlife in Balochistan. In December 1984, a party comprising Dr. Richard Mitchell (USFWS Office of Scientific Authority), Dr. Bart O’Gara, (former Head of the Montana Cooperative Wildlife Research Unit), and Dr. Bruce Bunting (World Wildlife Fund-US) arrived in Pakistan to evaluate various USFWS projects. The party was given a mandate by David Ferguson to explore opportunities for wildlife conservation activities in Balochistan and several discussions

were held with the relevant authorities of the GoB, who showed a keen interest in wildlife conservation. However, due to the weak capacity of the Wildlife Department and the fact that tribal areas were largely governed by tribal laws, the Wildlife Department made clear that an effective conservation programme would not be possible without the cooperation of the tribal chiefs.

A meeting with the tribal chiefs of Torghar followed and led to the formulation of a proposal to initiate a 'game guard' programme to operate under the auspices of a Torghar Conservation Programme. Although the idea was favorably received by the GoB, it was unable to offer any financial or technical assistance. In response the USFWS suggested that the programme could be self-supporting through limited but closely monitored trophy hunting of Afghan Urial. The tribal chiefs adopted this suggestion and the USFWS promised to provide limited technical assistance for wildlife surveys and a sustainable harvest programme.

3.2. The Game Guard Programme

The Game Guard Programme (GGP), developed by Richard Mitchell and Bart O'Gara as an integral part of STEP, recommended a halt on all poaching activities in Torghar. Tribesmen were to be recruited from the local population as game guards. The GGP recommended that wildlife surveys be undertaken and, based on a census, a limited number of Afghan Urinals to be hunted. The hypothesis was that the development of local livelihoods based on trophy hunting would demonstrate to the local tribesmen that managing the area for wildlife protection could be an economically viable use of land and that this would further act as an incentive for them to conserve the wildlife.

The GGP was launched in 1985 and seven local tribesmen – former hunters – were hired as game guards to control illegal hunting and to assist in wildlife surveys. Initial funding for salaries of the game guards was provided by the then owner of the US-based Pizza Hut food chain. The GGP has developed slowly since 1985 and limited trophy hunting has taken place almost every year to support the project. Additional game guards were hired as the programme progressed and today 44 guards are employed by STEP.

Torghar is an isolated area with a relatively small human population. Most residents know each other and/or are related by birth or marriage. Potential poachers face severe social pressures if they violate the 'no hunting' law. Poachers are quickly identified and face dire consequences. At an early stage of STEP, certain vested interests tried to create problems by spreading misinformation that the programme was a government ploy to take over the area. One such family even went to the extent of killing wild animals. These culprits were quickly identified, apprehended, fined, and jailed. Since then, no such incident of wildlife killing has occurred.

3.3. Government Laws and Policies in Relation to STEP

Wildlife, even when found on private land, comes under the jurisdiction of the provincial wildlife laws that are enforced by the Forest Department in the Balochistan Province. The Sulaiman Markhor and Afghan Urial are listed on the Third Schedule of the 1974 Balochistan Wildlife Protection Act as protected animals *i.e.*, these animals shall not be hunted, killed or captured. However, the government also retains the right to allow the killing or hunting of animals for scientific or public purposes as it sees fit.

The provinces are mandated by the constitution of Pakistan to manage wildlife. The National Council for Conservation of Wildlife (NCCW) acts as the scientific and management authority for the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) in Pakistan. Disregarding the underlying causes for diminishing wildlife numbers in Pakistan – loss of habitat and poaching by local people – the NCCW obtained a decision from the federal cabinet in 1988 to ban hunting of all big game in Pakistan for a period of three years. As expected, the hunting ban had no positive impact on the recovery of wildlife populations and the ban was extended for another three years in 1991. Whereas the public transcript of this ban was to help conservation, the private transcript was to stop the trophy hunting business of a few influential people in Pakistan, including those of STEP. Whilst the ban expired in 1994, the unofficial position of the NCCW is that the ban is still in force because the cabinet has not categorically decided that the ban has been

lifted. However in view of the community-based conservation and sustainable use programmes initiated by IUCN and WWF and the pressure that was put on the government by STEP, the NCCW has not (so far) taken any measure to further extend the ban.

Whilst the federal government's outright ban on hunting was to the complete disadvantage of STEP, the programme did manage to obtain provincial government's approval for hunting. However, NCCW declined to issue export permits, and STEP could only offer trophy hunts without any commitment to assist with export permits. The hunters who came were only able to export the trophies because the customs authorities had very little knowledge of the restrictions on the export of trophies. Thus STEP managed to operate despite the federal government's ban on hunting.

3.4. Sulaiman Markhor CITES Listing

Sulaiman Markhor (*Capra folconeri jerdoni*) was listed initially in Appendix II of CITES, but at the 8th Conference of Parties (COP-8) held in Japan in 1992, it was placed in Appendix I. Some of the conservation areas managed by either the communities alone (e.g., Torghar), or jointly by the provincial wildlife department and the local people (e.g., Tushi game reserve in Chitral), contained good Markhor populations and before this listing transfer were able to harvest a few trophy animals each year. The listing of Markhor in Appendix I prevented exports of trophies, and thus served as a negative incentive for communities. In 1995, IUCN initiated a community-based conservation and sustainable use programme that initially operated as a pilot project in some of the locally-managed conservation areas containing good Markhor populations. The NWFP Wildlife Department, STEP, and IUCN worked together to convince the Government of Pakistan (GoP) that the populations of Markhor in at least three habitats were healthy and community management structures were in place for the conservation of the species. On the recommendation of the GoP at the CITES CoP-10, held in Harare, Zimbabwe in 1997, Pakistan was allowed an export quota of six trophies of Markhor from community conservation areas.

3.5. Sustainable Use

STEP is based on the principles of 'sustainable harvest' alone, but takes a more holistic approach based on the principles of 'sustainable use'. 'Sustainable use' is often confused with 'sustainable harvest'. The latter refers to a scientific tool that ensures periodic harvesting without causing a negative impact on the population whilst the term 'sustainable use' refers to a 'concept' which produces multiple ecological, social, cultural and economic benefits and requires conservation awareness and attitudinal and behavioral change. In the case of Torghar, a 'sustainable harvest' based on surveys is between 4 and 18 Sulaiman Markhor and between 4 and 17 Afghan Urial annually. However, STEP has allowed hunting of only 1-2 Markhor and 1-4 Urial per year as it committed more to conservation than trophy hunting.

4. Major Management and Conservation Issues in Torghar

4.1. Government Authority

According to the Balochistan Wildlife Protection Act, 1974, all authority for the conservation and management of wildlife rests with the government. Although STEP was initiated on the suggestion of the then Chief Conservator of Forests, a formal memorandum of understanding (MoU) was never signed between the government and the management board of STEP. The laws and policies of the government are not supportive of private or communal initiatives for the management of wildlife. Consequently, STEP has encountered an almost constant stream of problems and obstacles since its inception, as the Government, being a regulatory agency, has always questioned the legitimacy of the project as a conservation program and has always been reluctant to issue hunting and export permits for trophies. STEP continues to operate and overcome problems because of personal influence. Although the government authorities acknowledge the contributions of STEP, no serious effort has been made to provide the programme with the necessary legal support. Consequently, in spite of the success of

STEP, similar conservation programmes have not been initiated in other areas despite the interest of local communities.

4.2. Institutional Capacity

STEP was established purely as a family initiative of a few tribal chiefs. Technical support came from the US Fish and Wildlife Service and other wildlife professionals in the United States, rather than via formal bilateral relationships between the governments of Pakistan and the United States. Only two self-employed tribal leaders are currently responsible for the day-to-day management of STEP. One of them is a university graduate with no training in biology or ecology, and the other is a professional filmmaker. The game guards, through hands-on training, have now gained enough experience to independently undertake surveys of Markhor and Urial populations.

The wildlife surveys conducted by expatriate professionals have been the cornerstone of STEP's national and international credibility. STEP cannot entirely rely on this technical support forever, and therefore needs to seriously examine its own technical capacity. The focus of STEP has so far been on the conservation of two key species – an objective that has been achieved successfully. However, other resource management issues, such as development of agriculture, livestock, water resources, and range management have begun to emerge as priority issues both to alleviate poverty as well as to conserve biodiversity at the ecosystem level. The economic development and social welfare interventions made so far have been *ad hoc* in nature. STEP lacks the capacity and resources to undertake a systematic planning venture for development and fund raising.

4.3. Community Development

STEP operates with the active support of the Kakar sub-tribes of Torghar who are aware of the benefits of wildlife conservation. STEP has not yet felt any need to undertake community development aimed at fostering local institutions at the grassroots level and building their capacity to become active partners in sustainable development. Recently the sub-tribes have started to take local-level decisions on the hiring of game guards for STEP whereas before hiring was at the sole discretion of STEP.

The local people are extremely poor, and government extension and development support is almost non-existent. Primary health care and education facilities are lacking; the worst affected are women and children. Basic necessities are either not available or are available at exorbitant prices. There is no telecommunication link with the rest of the country and locals have no access to credit or banking services. The time has now come for TCP to broaden its mandate and start paying attention to sustainable development at the grassroots level.

4.4. Advocacy and Outreach

Whilst the work of STEP is known globally, nationally the contributions of STEP to conservation of biodiversity are relatively unknown. Most professionals and government officials have heard of Torghar but only a few have visited the area. Many view STEP as a 'commercial hunting' programme and consider the management as outfitters for trophy hunts. STEP needs to reach out and dispel doubts among professionals and government agencies, and become part of mainstream community-based conservation programmes. It also needs to be more active in influencing changes in policy and laws for creating a favorable environment that allows greater participation of communities in conservation.

4.5. Livestock-wildlife Interaction

The total number of livestock owned by the local people is not known and an assessment of the range condition and grazing capacity has not been undertaken. Both STEP and the locals are aware of the excess livestock numbers. The local tribes are aware of the potential problems of having excess livestock and are seriously interested in being involved in the formulation and implementation of range management plans. One of the main causes of the increase in livestock numbers is that there is no local cash economy and consequently people

invest their savings in livestock. The overstocking problem could, to some extent, be solved by introducing a community-managed savings and micro-credit programme.

4.6. Habitat Improvement

The 700km² Torghar conservation area has a ‘core’ zone and an outside ‘buffer’ zone. The vegetation in the core zone is in good condition as grazing pressure is light. There is heavy grazing pressure on the buffer zone and the vegetation condition is poor. The western limit of the core area at Tor Gh’berg, Shin Naraiy forms the eastern limit. The buffer zone extends another 15km beyond the core area.

Some areas of Markhor and Urial habitat in Torghar – especially in the valley floors and along caravan routes in the buffer zone – have been and continue to be degraded by heavy grazing of domestic livestock and fuel wood collection. The core zone is predominantly in rugged terrain and not easily accessible and therefore natural factors have helped to preserve it in a relatively better condition.

4.7. Conservation Fund

Conservation requires a long-term commitment and this is not possible without a viable financial base. STEP must seriously consider the establishment of an endowment fund to meet the recurring cost of conservation. A certain amount of the income from trophy hunts may be used to provide initial capital for the fund. Other sources, such as the Global Environment Facility (GEF) medium-scale grants, may be explored to provide (or supplement) annual operating capital.

4.8. Legal Basis for STEP

STEP has no legal authority for managing wildlife. It has managed to survive in the unfavorable policy and legal environment purely through the clout of the tribal leaders managing the programme. Many government officials consider STEP to be an illegal operation, but are unable to bring it under their control or stop it operating. STEP has now earned a reputation for itself, and therefore it would be prudent for it to consider entering into an understanding with both the provincial government and the federal government, and signing a memorandum of understanding to this effect. This will enable STEP to obtain legal status as a community-managed conservation area under the wildlife legislation.

5. Achievements of STEP

5.1. Population Dynamics of Key Species in Torghar

In 1985, Dr. Richard Mitchell of the USFWS spent a week in Torghar assessing Markhor and Urial population dynamics. Based on observations and interviews with the local people, he estimated that the Markhor population was less than 100 and that the Urial population stood at 200+. On the basis of the survey, the hunting of 1-2 Urial was considered feasible. In the late summer of 1992 and again in the spring of 1994, Dr. Kurt Johnson of the USFWS visited Torghar and estimated the Markhor and Urial populations to be at 200 and 600+ animals respectively. In November 1994, he conducted a scientific census, which indicated that the area within STEP contained a population of around 700+ Markhor and 1200+ Urial. He concluded that although most mountain ranges in Balochistan had not yet been formally surveyed, these results suggested that Torghar was one of the last remaining strongholds for both species.

Michael R. Frisina, Charles Woods, and Michael Woodford conducted another population survey in 1997. According to the survey report, the populations of both Markhor and Urial were definitely increasing. The data indicated a 118 percent increase between 1994 and 1997 for Urial. The estimated 1997 population of Markhor was 1,296+ and Urial, 1,543+. Estimates of the 1999 survey by Mike Frisina show 1884+ Markhor and 1752+

Urial. The surveys carried out in 1994, 1997 and 1999 followed similar methods and therefore the results are comparable.

5.2. Ecosystem Conservation

In addition to species conservation, there has been a phenomenal recovery of the degraded ecosystem. This is apparent from some recent discoveries; several species have been re-recorded in the area, with at least one being discovered for the first time. Whilst this change in the areas' species composition is not economically significant, it represents positive changes in the local ecology and the indirect benefits of a trophy hunting operation which seeks to regenerate an ecosystem as a whole and not just populations numbers of selected species.

5.3. Conservation Building and Raising Awareness

Initially, the local people were suspicious that STEP was simply a method by which the government would assert its authority over Torghar. Some of the tribesmen, being fiercely independent and always reluctant to involve the government in their affairs, opposed STEP. Later, as the community saw no government interference and began benefiting from the project, their suspicions faded. At present, there is no opposition to the project from local people, in fact, many communities from other areas are approaching STEP for help to initiate similar programmes.

The focus of STEP is not only on the conservation of Markhor and Urial, but of the entire ecosystem. This has been achieved by raising awareness of the local people by explaining to them the importance of cause-and-effect relationships in natural ecosystems using easily understood local examples, the best example being the predator-prey relationship of the leopard and porcupine. The population of porcupines has increased severalfold due to the local extirpation of the leopard. The porcupines forage on the bark of wild pistachio trees, thereby girdling and killing them. Wild pistachios are an important part of the diet and economy of tribal people. Thus, the people have come to realize that killing leopards has had negative consequences for their livelihoods.

A film depicting ecosystem recovery in Torghar is in preparation. This film will be an important educational tool to raise awareness at local, national, and international levels as to how a programme initiated to conserve key species has contributed to the rehabilitation of an entire ecosystem.

5.4. Development of Local Livelihoods

STEP began by hiring seven tribesmen as game guards in the spring of 1985 to patrol specific areas of Torghar. Currently there are 44 game guards protecting approximately 1,800km². However, this number is inadequate, as the populations of the keystone species have significantly increased and it has become necessary to extend the patrol area. The game guard program is the only source of employment in Torghar, and the salary earned by the guards is an important monetary supplement. The local people now see a direct link between employment and social well being and are fully aware that hunting can take place only if there are healthy populations of keystone species.

5.4.1. *Economic Development*

STEP has financed development of the infrastructure in the area through a grant from the United Nations Development Programme (UNDP)/GEF Small Grants Programme, and income from trophy hunting. The main development activities include:

- Construction of water storage tanks.
- Construction of irrigation canals.
- Building of terraced field for orchids.

- Supply and plantation of fruit trees.
- Expansion and clearing of springs.
- Repairing of old link-roads.
- Construction of new link-roads.
- Construction of water storage dams.

These activities were planned with the active participation of local tribesmen and implemented by them. The underlying reason for carrying out these tasks was to increase agricultural productivity through optimal use of natural resources and to reduce dependence of local people on wild living natural resources. The construction of new roads has allowed the people of Torghar to travel to surrounding towns to fulfill their essential needs.

5.4.2. Social Welfare

In contrast to the limited economic development activities, STEP has focussed heavily on provision of social services to the local people. The social services provided include:

- Medical aid and medicines.
- Incidental funds for the poor and needy.
- Supplies of tents, clothing, *etc.*

6. Future Plans of STEP

Torghar is a very poor agro-pastoral society based primarily on subsistence agriculture and livestock. There are few permanent, salaried jobs in the area. Thus, there is tremendous need for both additional sources of income and permanent jobs for valley residents. Both these needs provide strong incentives for people to participate in and support the project. The conservation activities planned for the future are focussed on improving the local habitat and helping maintain and improve the overall biodiversity of the area. Natural resource management and research activities will be supported from STEP's own resources and with the help of international as well as national research institutions. Brief descriptions of proposed activities follow.

6.1. Game Guards

The program began by hiring seven tribesmen as game guards. Currently 44 game guards are employed which is not sufficient for protecting the entire area of Torghar. The recruitment of six more tribesmen is planned which will put the total number at 50. Anti-poaching patrolling requirements as well as tribal equity will be considered during hiring.

Due to the complicated tribal setup, the hiring of game guards is a very complex and difficult affair. There are about eight major sub-tribal groups, each having a committee of elders which nominates their fellow tribesmen for induction as game guards. The sub-tribes take full responsibility for the game guard's duties and conduct.

6.2. Biodiversity Surveys

The annual population surveys of Markhor and Urial will continue as a regular activity. Surveys will be undertaken every year during fall and spring seasons and will follow standard survey methodology. There are also plans to facilitate detailed surveys of the flora and fauna through national and international research institutions.

6.3. Natural Resource Management Operations

A detailed natural resource management plan will be prepared, encompassing conservation and sustainable use. The program objectives will be to conserve biodiversity, soil, and water resources, and to regenerate rural livelihoods and the socio-economic welfare of the people based on judicious use of the local resources. STEP plans to promote and initiate the planting of woodlots of indigenous trees near habitations so as to meet the fuelwood and timber requirements of the local people. In addition, to evenly distribute the grazing pressure, there are plans to build a series of water-storing dams throughout Torghar.

6.4. Research Facilitation and Conservation Support

STEP will continue to facilitate the research activities of national and international organizations. Because of the publicity that STEP has generated, tribal groups from at least seven other mountain ranges in Balochistan have expressed an interest in establishing similar programmes. STEP will assist these local communities in their plans to initiate similar conservation programmes in their areas.

6.5. Development of Water Resources, Agriculture and Livestock

Torghar is rich in water resources in comparison to most other montane areas in Balochistan. Springs, both permanent and seasonal, are the main source of drinking water, although most of it is wasted due to the lack of storage facilities and improper irrigation channels. STEP plans to build a number of additional concrete storage tanks and water supply channels to increase agricultural production, improve the drinking water supply, and provide a steady flow of water for livestock. Hand-pumps will be installed where surface water is unavailable. The building of a network of storage dams in Khaisore and Kundra (where there is no source of permanent water) is also planned. This will help in reducing the competition for water between livestock and wildlife.

Traditionally, the local economy has been based on raising small numbers of domestic livestock, mainly sheep and goats. The increasing numbers of livestock pose a constant threat to the vegetation and increase livestock-wildlife competition. Agriculture is seen as an alternative to raising livestock and a means by which grazing pressure and livestock-wildlife interactions can be reduced. Agricultural activities in Torghar are presently limited to fruit harvesting from orchards in the Tanshipa Valley where the climate is most suitable for growing quality apples, almonds, and cherries.

Orchards and crops are grown on terraced fields in the valley because the area is mountainous and uneven. Land leveling and terracing requires the use of bulldozers and tractors, but the cost of hiring such machinery is beyond the means of any tribesman. A STEP plan for the development of agriculture calls for the moderate development of orchards and croplands through leveling and terracing of fields, distribution of fruit trees and seeds, and training local tribesmen in agricultural practices. 'Model' orchards and fields will be developed with the assistance of agricultural experts to help teach locals. Tractors will be supplied during this time to help with ongoing agricultural activities (*e.g.*, clearing and tilling fields). Precaution will be taken to prevent habitat fragmentation.

Improved livestock management practices may also help reduce the number of sheep and goats. Veterinary and animal husbandry experts from Quetta will be consulted for ways to improve the productivity and survival of domestic livestock in Torghar (*e.g.*, by vaccination against disease). STEP also plans to train a small number of game guards as 'grassroots' extension workers for prevention of livestock and poultry losses, improvement of agriculture, *etc.*

6.6. Development of Physical Infrastructure

Using revenues from trophy hunting a 20-mile dirt road was constructed connecting the Tor Gh'Berg area with Kundra village and other areas. There are still a few isolated areas in need of roads and existing roads are dirt-based and require maintenance after snowfalls and rains.

6.7. Social Welfare

In the past, STEP has provided medicines and medical aid to the people of Torghar by using limited funds generated through trophy hunting and by distributing medical supplies donated by Houbara Foundation International. A grant from the UNDP Small Grants Programme has also allowed for the distribution and acquisition of medical supplies. This social welfare assistance is of great benefit to the people of Torghar. Poverty, cultural traditions, and a lack of communication infrastructure prevent many tribal people, especially women and children, from visiting doctors. On-site primary care continues to be a priority of this plan.

In the future, the provision of medical aid and assistance will be undertaken on a more regular basis. Medical camps staffed by female doctors will be set up in different parts of Torghar two or three times per year.

6.8. Finances

STEP does not consider it appropriate to harvest the total allowable number of animals for trophies as a means to finance the socio-economic development of Torghar. Whilst objectives relating to conservation have been almost fully met, social and economic development have been slow in comparison, and the basic needs of the people remain mostly unfulfilled.

STEP depends entirely on the income generated from trophy hunts of Markhor and Urial by international hunters. In the past it has also received small donations and grants that have played a vital role in raising awareness and creating incentive for people's involvement in conservation. A recent grant of US\$50,000 from the UNDP/GEF small grants programme enabled STEP to assist local people with some of their development needs. In addition to income relating to trophy hunting (figures not readily available), STEP has received US\$10,000 from the Houbara Foundation of Pakistan and 150,000 Pakistan Rupees (PKR) from WWF Pakistan (approximately US\$2,500).

STEP has overhead and management costs that must be covered by the income from trophy hunting. Once operating costs have been deducted the government takes 25% of the income from trophy hunting fees whilst 75% is forwarded to community organizations

There are few, if any, opportunity costs associated with STEP because the project does not utilize any resources that might be better-used for other conservation activities and the project does not preclude any other viable management options that might contribute to maintaining the Markhor and Urial populations. There are no other viable consumptive uses of Markhor and Urial that provide the same economic return per animal harvested.

The only potentially viable non-consumptive use of these species is ecotourism, specifically for photography. Unfortunately, Torghar is a remote area and access is difficult and tourism opportunities are rather limited. A controlled harvest of Markhor and Urial would not significantly affect opportunities to use these populations as a tourism feature as harvesting would not reduce the number of animals available for viewing. Harvesting would not interfere with the esthetics of viewing, since harvesting takes place at a time of year (November) when tourists are not likely to be present because of poor weather.

7. References

Rosser, A. and Haywood, M. (eds). 1996. *CITES: A Conservation Tool*. IUCN, Cambridge, UK.