Protected Areas: A Resource or Constraint for Local People?

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A Study at Chitral Gol National Park, North-West Frontier Province, Pakistan

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We investigated local people's perceptions, knowledge, and attitudes toward conservation planning and management in Chitral Gol National Park in North West Frontier Province (NWFP) of Pakistan. A literature review was undertaken to unravel the historic drivers behind the formation of this protected area. Key informant interviews and questionnaire surveys were conducted to evaluate the effectiveness of current governance approaches adopted by the park management authorities. Community-based questionnaire surveys and key-informant interviews focused on local communities' knowledge and awareness of the objectives of the park, people's role in decision-making, social characteristics, and resource use structures. The information from these surveys was evaluated within the context of good governance and sustainability of park management. Results show a lack of awareness and a low level of participation in protected area management, but a high degree of willingness in the communities to participate in conservation activities. An analysis of the survey data suggests that the park authorities enforce strict protection measures within the park, but this approach lacks a strong vision of sustainability. The surveys reveal that the local people have a very strong sense of belonging to the place and are willing to contribute to the protection of the PA. A large majority of the respondents rely on electronic media as their main source of information, which could potentially form the best medium for conservation campaigning in the region. With these findings in mind, we propose changes to the current governance model for effective and sustainable management of the park in the future.

Keywords: Biodiversity; indigenous peoples; conservation and communities; protected areas governance; mountain development; Chitral Gol National Park; Pakistan.

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Introduction

Protected areas (PAs) such as national parks and wildlife reserves now cover more than 12% of the Earth's surface and are considered an essential component of conservation strategies globally (Wells and McShane 2004; Bajracharya et al 2005). Although there is still considerable argument among conservationists about the representation and sufficiency of these areas and the occurrence of gaps in the existing networks (Brooks et al 2004; Rodrigues et al 2004; Monkkonen et al 2009), there is now a common consensus that an effective protected area network needs to be maintained. However, the PAs are effective only if they are managed efficiently. Good governance, therefore, is the key factor in strengthening the effectiveness of PAs (Smith et al 2003). The quality of governance is assessed based on various factors, including the involvement of key stakeholders in the process of decision-making (Dearden et al 2005).

Conservation International's Biodiversity Hotspots is one of the most prominent global strategies for conservation (CI 2009). It has been suggested that hot spots of biodiversity also overlap with hot spots of poverty (Fisher and Christopher 2007). While the biodiversity hot spots in developing countries are at the front line of conservation efforts, they are also vulnerable to the pressures arising from persistent poverty and rapid and unchecked increases in local population. It is estimated that more than 1.1 billion people—nearly 20% of the world's population—with a growth rate (1.8% per year) higher than the population growth rate of the world as a whole (1% per year) are living within these hot spots (Cincotta et al 2000). The majority of these people are directly dependent upon protected areas within these hot spots for their basic needs. In some cases the declaration of PAs means that the local communities must not only forgo access to resources such as fuelwood, fodder, and other products such as medicinal plants but also suffer direct losses to crops and livestock-raiding by wild

animals inhabiting PAs (Sekhar 2003). Therefore, researchers have suggested that the identification of priority conservation areas should not be based on biological aspects alone. Instead, integration of both biological and social aspects should be considered within the identification process (Shi et al 2005; Pinto et al 2007). While perceived as difficult to attain, researchers have argued that it is possible to find win–win solutions to resolve or decrease the magnitude of overlap between poverty and conservation in these regions (Adams et al 2004; Cernea and Soltau 2006; Fisher and Christopher 2007).

Many conservationists working in developing countries consider conservation in PAs to be unsustainable unless local communities become an integral part of PA management (Infield and Namara 2001). There are various case studies of successes in addressing biodiversity conservation priorities while simultaneously addressing local inhabitants' livelihood needs (Galvin and Haller 2008). Some researchers even suggest that voluntary conservation is the more economically and socially acceptable approach (Monkkonen et al 2009). For example, a number of conservation nongovernmental organizations (NGOs) in the United Kingdom depend on the contribution that volunteers make to the management and maintenance of various nature reserves (RSPB 2009). It is also apparent that comanagement efforts in the form of community-based conservation projects have made it possible to help reduce the severity of these problems for the local people and management around national parks (Matose 2006). Communities in and around PAs have a long-standing relationship with the land in addition to dependency on its resources—for example, their cultural identity, spirituality, and subsistence practices are known to contribute to conservation of biological diversity on their land (Trakolis 2001). Implementing systems of managing PAs that exclude local communities or their participation has resulted in various conflicts and problems, such as dislocation, violence, poaching, and poverty among indigenous communities (Nepal 2002). These concerns have led to a growing recognition of the role of local people in the sustainable and effective management of PAs (Rao et al 2002). Comanagement, community-based conservation, and other systems of governance that involve local people in decision-making have recently become very popular in protected area management globally (Colfer et al 1999; Granek and Brown 2005).

Effective governance, however, is not only about involvement of stakeholders; it is also about the execution of power, who has how much influence, who makes the decisions, and how decision-makers are held accountable (Graham et al 2003). Although the answers to many of these questions are directly linked to national policies, they also reflect the institutional policies of the organizations working at the grass roots. Researchers have

observed an increasing trend toward greater participation by stakeholders and the use of formal accountability mechanisms to guarantee the legitimacy and effectiveness of grassroots organizations (Paavola 2004; Dearden et al 2005).

The Hindu Kush–Himalayan region is 1 of the 34 biodiversity hot spots in the world. While rich in biodiversity, it is also a densely populated region faced with severe poverty. The efforts to establish a network of protected areas in this region of HKH are relatively recent. For example, the first protected area in the North West Frontier Province (NWFP) of Pakistan was established in the early 1980s (Wildlife of Pakistan 2007). Very little research has been done to assess the strength of current governance of PAs, how these governance regimes change over time, and the main factors that can potentially affect future governance. Although Pakistan has an extensive PA network in regions of high biodiversity, that is, Himalaya and Hindu Kush (WCPA 2003), these PAs were designated without any involvement of local communities and are governed by the forest management laws set out during the British colonial period (Ribbentrop 2004). The main aim of the present study was to evaluate the current PA governance model to determine the levels of awareness, perception, involvement, and participation of local communities. The article reviews the literature on the formation of PAs in NWFP and makes an assessment of the existing model of PA governance based on comprehensive surveys and informal interviews with key stakeholders. The article also makes a number of recommendations for effective management of the PAs. The study was carried out at Chitral Gol National Park (CGNP), and some of the key-informant interviews were conducted at Peshawar, where the administrative offices of the national park are located.

Study location and background

Chitral Gol National Park, established in 1984, is situated in NWFP. The park lies between 71°42′12.60″E longitude and 35°53′30.34″N latitude in a narrow valley 320 km long in the northwestern corner of Pakistan (UNESCO 2009) (Figure 1). The park is currently 7750 hectares in size. In December 1971 the park was given the status of a wildlife sanctuary for 5 years. In 1975 the governor declared all the mountains, forests, rangelands, and hunting reserves in Chitral to be state property without any public consultation. Finally, in October 1984, Chitral Gol was given the status of a national park, with alpine river catchments in the Hindu Kush mountains with an elevation ranging from 1450 to 4979 m (Inam-ur-Rahim 2005).

The average maximum temperature is 29°C, and the average minimum temperature is around 4.2°C, but during the summer it often exceeds 35°C, and in the winter it can fall to −20°C (Wasson 1978; Gov-NWFP 2007). Due to the absence of monsoon rains, the valley

FIGURE 1 Map of Chitral Gol National Park showing settlements and park facilities. (Map redrawn from material provided by Department of Wildlife, NWFP)
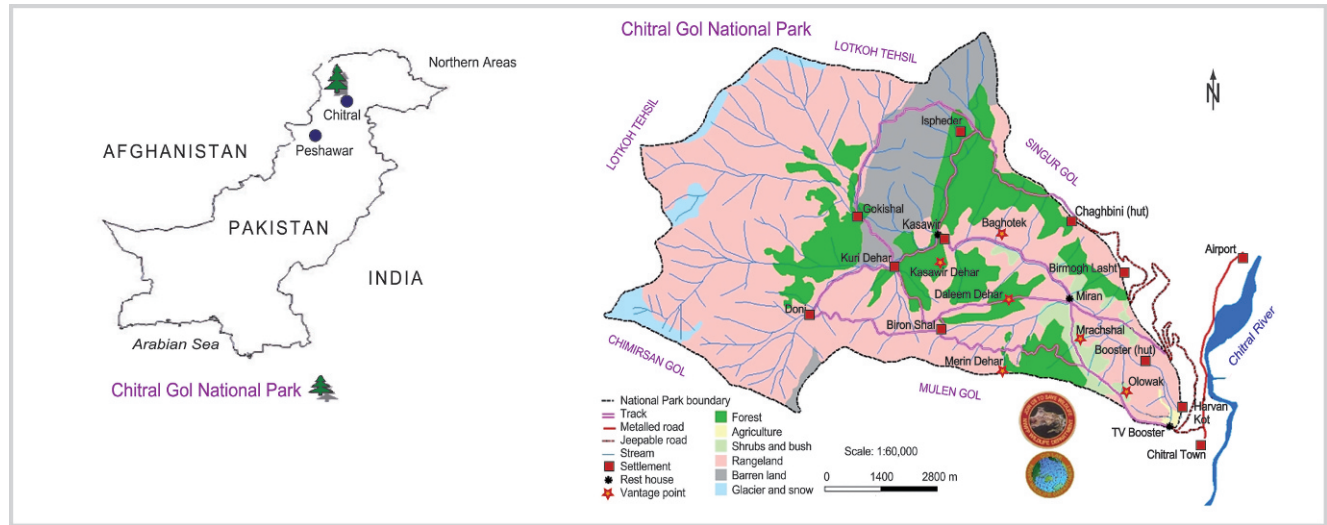
receives 462 mm mean annual precipitation, mostly in winter and spring (Inam-ur-Rahim 2005). Habitats are mostly alpine meadows and dry temperate forests due to low rain and high elevation, although there is an appreciable amount of winter snow and long dry summers leading to the dominance of drought-resistant and cold-tolerance vegetation in and around the park (Wildlife of Pakistan 2007).

The population of Chitral is around 400,000 distributed in 50,000 houses. About 20,000 local people live in the buffer zone surrounding the CGNP (1998 census), most of whom are dependent on park resources. Most of the custodian communities are in a cluster in the southeast portion of the park consisting of nearly 12 small *mohallas* (streets). Each *mohalla* is considered a different village, although there is little distance between them, making it difficult to demarcate boundaries accurately. Chitral was an independent princely state prior to 1896 and under British colonial authority from 1896 to 1947; even after joining Pakistan in 1947, the state of Chitral had its traditional institutions run by local communities to manage existing resources (Ehsan-ul-Haq 2007). The people of Chitral speak the Khowar language, which belongs to the Dardic group of Indo-Aryan languages. Other commonly spoken languages are Pushto, Kalasha, Dameli, Yidgha, Phalura, Gujari, Gawar-Bati, Nuristani, Wakhi, and Kirghiz, but a majority of the people can speak and understand the national language, Urdu (Decker 1992). The means of earning a livelihood are limited; a majority of the people in the valley are subsistence farmers with a small amount of land (0.53 ha on average). In addition to farming they rear animals or are linked to the tourism industry for their livelihood. Because of the soil type and rough terrain, only 22,552

hectares are under cultivation, mostly used to grow a single crop each year (IUCN 2004). Some people engage in handicrafts, such as knitting or embroidery, as well as gardening and poultry rearing as additional minor sources of income. The gender division of labor is obvious; men and women are expected to adhere to gender-specific roles. Researchers suggest that as park resources such as fuelwood, fodder, and medicinal plants are mainly harvested by women, better education of girls could provide them alternate job opportunities and divert people from forest-dependent activities (Gunatilake 1998). But due to socioeconomic changes in the valley, these roles are no longer restricted to a single gender (IUCN 2004; Figure 2).

Because of the top-down management practices of protected areas, access to park resources is limited. Protected areas in Chitral cover a total of 1804 km^2, including Chitral Gol National Park, which is spread over 77.5 km^2. All protected areas in Chitral including Chitral Gol National Park are protected from consumptive use, including grazing, firewood collection, and timber harvesting, which gives rise to conflicts with the wildlife and forest departments on various occasions and quite often leads to court cases (IUCN 2004). Furthermore, the unsettled land was inherited by the former princely state of Chitral and is currently owned by the heirs of the former prince, which leads to conflict over land use (Wildlife of Pakistan 2007).

Research methods

Sampling design and data collection
Research was conducted by means of community-based questionnaire surveys of local people (Figure 3) and key-

FIGURE 2   A young man collecting fuelwood in the vicinity of Chitral Gol National Park. (Photo by Muhammad Siddiq Khan)

informant interviews (people either directly involved in park management or having knowledge and experience of the conservation of biodiversity in NWFP). In Chitral Gol National Park, the majority of the villages are very close to each other, and there is no substantial variation in village setting. Therefore, a complete randomized sampling design was used for the community questionnaire surveys (Gunatilake 1998; Layden et al 2003). Out of 14 villages in the periphery of the park, 7 villages—Jang Bazar, Shah Miranday, Shahladin, Dangrikandi, Rehankot, Singur, and Zargarnadey—were randomly chosen. In each village, 5 individuals were randomly selected and interviewed, giving a sample size of 35. Due to local cultural practices and religious beliefs, it is not common for women to talk to strangers. Therefore, it was not possible to include women in these surveys.

Surveys were conducted during the months of June and July 2007 on weekdays and sometimes weekends between 0800 and 1700 hours. The survey questionnaire was translated into local languages, but a majority of people were able to understand the national language, Urdu. In approaching the village communities, guidance and assistance were taken from the department of wildlife where necessary but not to such an extent that the perceived alliance with a government department made the sampling biased. The survey design and the questions were developed following the technique used by various researchers as effective tools studying communities' perceptions (Trakolis 2001; Pavlikakis and Tsihrintzis 2006; Xu et al 2006).

The questionnaire was divided into 4 main categories as follows:

1. **Basic infrastructure in the area and geographical location:** Seven questions were asked of community respondents in order to assess the know-how of the interviewees about the park, infrastructure, and geography of the area. Details of the questions asked and a summary of the statistics of responses are presented in the *Supplemental data* (Appendix S1; http://dx.doi.org/10.1659/mrd.00024.S1). These questions were asked with the intention of collecting information about infrastructure and meeting basic needs in the area, as this could affect the dependency on park resources, for example, "Do you have electricity in your house?" or "What mode of transport do you use for travel?"

2. **Social characteristics and resource use structure:** In this category questions were designed to gain understanding of the level of resource use and dependency on resources and the feelings/perceptions of local people about the park. The purpose of these questions was to make an assessment of whether the feelings of the respondents about their national park were affected by their dependency on park resources. Questions about sense of place were asked to assess the feeling and affection of the locals for the place where they live. Also, attitudes of local people toward management were investigated by asking other questions.

3. **Awareness and knowledge of the local people about the park:** To understand the community's knowledge and awareness about fauna and flora and the importance of protected areas, certain questions were designed (*Supplemental data*, Appendix S1; http://dx.doi.org/10.1659/mrd.00024.S1), for example "Do you think the park is very important for the protection of wildlife?"

4. **Perception about park management and role of local people in decision-making:** The purpose of these questions was to gain knowledge about the effectiveness of the current governance model, management efficiency, and level of participation of local communities in park management.

Key informant interviews were conducted in such a way that even representation of all various interest groups concerning park management was achieved. Selections of key informant interviewees were made on the basis of previous experience of working in the region and also in direct consultation with the people active in conservation spheres in the area. All the interviewees were contacted in advance by email and telephone. After confirmation of willingness to participate in the survey, a face-to-face or telephone interview was carried out. In the majority of interviews the language was English or Urdu, but Pushto was used when necessary.

Interviews were recorded only if permitted by the interviewees. Some interviewees preferred to send their comments by email rather than do a face-to-face or

FIGURE 3 Interview with a local elder during the surveys. (Photo by Muhammad Siddiq Khan)

telephone interview. Twenty key informant interviews were conducted in 4 participant categories:

1. Management of national park
2. Community representative
3. Academia
4. NGOs

A detailed format was designed for interviews in each category, keeping in mind the main purpose of gathering in-depth knowledge in the following areas:

- Historic background of, importance of, and drivers behind the formation of PAs
- Current governance structure and its efficiency
- Role and level of stakeholders in various management decisions
- Effectiveness of current participatory approaches/ initiatives, such as community-based snow leopard conservation in Chitral.

- Threats and opportunities to paradigm shifts in governance, both top-down and bottom-up in the context of the NWFP
- Accountability and legitimacy
- Future vision for PA management in the region

Each interview took 45 to 50 minutes on average, depending on the explanations provided by the interviewee.

Data processing and analysis

For qualitative data, a strengths, weaknesses, opportunities, and threats (SWOT) chart was developed based on information gathered from a diverse range of participants through key-informant interviews and survey questionnaires from locals (Figure 4). This was adapted from 5 governance principles for protected areas in the 21st century, including legitimacy and voice, direction, performance, accountability, and fairness (Graham et al

FIGURE 4 SWOT analysis concerning the governance of protected areas in NWFP with regard to Chitral Gol National Park.

SWOT

	Strengths	Weaknesses	Opportunities	Threats
Legitimacy	+ Global importance and recognition + Designated by the government and constitutional status as part of customary law and under the supervision of a government department (Department of Wildlife) + Designated by the government, part of customary law, and under the supervision of a government department	+ Top-down management through government departments + Lack of stakeholder involvement. + Unsettled ownership rights + Lack of awareness among the stakeholders + Government as sole decision-making body	+ Multi-stakeholder involvement in the management + Direct benefits to communities + Consultative, cooperative and stakeholder decision making structure + Direct share for community development from the income-generating activities in the areas	+ Conflicts among the stakeholders + Misuse of resources + Conflicts due to unsettled ownership rights
Accountability Transparency	+ Audited by the Auditor General of Pakistan + Monitoring by international funding bodies + Government command and control system through a hierarchical management structure already in place	+ Lack of stakeholder identification and ambiguity about stakeholders' role + Lack of independent monitoring both of audit and governance + Lack of provision of information through electronic and print media to all the stakeholders (online web-based information).	+ Involvement of stakeholders + Stakeholder analysis for identification of their respective roles and responsibilities + Joint advisory committee or board for each national park with even representation of all stakeholders (including community, academia, media, NGOs, and government departments) + Provision of relevant information easily accessible to all stakeholders + Co-management necessary for enhancing transparency + Independent monitoring	+ Can affect the trust of stakeholders and even of donor organizations + Overlap of jurisdiction and power with other departments, eg the Department of Forests

PA Governance — Performance	+ Effective management of endangered species by enforcement of governance system
	+ International funding for some PAs
	+ Fully-funded PAs are achieving operational objectives
	+ Willingness of communities to participate
	+ Improved funding: three major internationally-funded projects
	  › Palas Conservation and Development Project Rs 285,557 million (funded by EU and Birdlife International)
	  › Mountain Area Conservation Project US$10 million (funded by Global Environmental Facility, GEF)
	  › Protected Areas Management Project US$ 10 million (funded by GEF through World Bank)
	+ Majority (100% in our surveys) of the community knows about the importance of the Park; 68% are friendly with the Park management and 97.1% would like to participate in the management and protection of wildlife
		+ Weak interorganizational linkages and stakeholder participation
		+ Lack of alternative funding sources
		+ Lack of a governing body consisting of academia, government, NGOs and communities
		+ Lack of alternative resources for fodder and fuel-wood for the communities around the protected area (PA)
		+ Increased dependence on policing rather than community support
		+ Lake of skilled manpower trained in biodiversity issues
		+ Lack of a future plan and vision
		+ Staff allocation based on projects and short-term contracts
			+ Comanagement approaches to include all the stakeholders and increase governance sustainability and stability
			+ Exploring sources of alternative sustainable funding
			+ Exploring alternative sources for basic needs in order to avoid total dependency on PAs
			+ Capacity building of staff by providing in-service training and equipping them with up-to-date information (particularly new research)
			+ Exploit the willingness of communities to participate in protection and management by directly giving them some responsibilities
			+ Development of a plan with a vision for 10-20 years
			+ Coordination with academia and research universities for monitoring species population dynamics and development of species action plans
			+ Interprovincial coordination and a centralized body at least for transboundary species and the Protected Area
				+ Lack of sustainability
				+ Lake of adequate funding
				+ Immediate threats of:
				  ✓ Habitat degradation
				  ✓ Rapid human population growth
				  ✓ Poaching
				  ✓ Unsustainable forest harvesting
				  ✓ Lack of community participation
				  ✓ Lack of interdepartmental coordination
				  ✓ Weak capacity and lack of financial resources
				  ✓ Climate change
				  ✓ Invasive species
				+ Low levels of staff interest due to temporary or contract-based recruitment and comparatively low pay scales
				+ No mechanism to accommodate/compensate local people's property losses due to wild animals
				+ Underpaid Park staff

Direction	+ Rich biodiversity + Global recognition and importance + Established structure and resources + Recognition and strong will of the local people to be involved in management	+ No management plan or visionary document with long-term goals as current targets of the PA + Adequate funding uncertain + Need for institutional strengthening + Need for enforcing PA rules and mandates + Lack of a strong vision for the future	+ Sustainable funding streams + Increase in training opportunities and access to latest knowledge at all levels of of PA management + Collaborative efforts for PA management with all concerned agencies, including relevant government departments and public structures + Enhancing of ecotourism + Establishment of performance indicators in light of the objectives of each PA + Establishment of a Park committee, comprising major stakeholders, with clear terms of reference + Specific funds for management-based research and direct involvement of academia on the advisory board + National-level changes in the policy for environmental education at all levels + Mass Awareness Programs in PAs and all the adjacent districts of NWFP regarding the conservation of biodiversity	+ Negative perception of commonalities regarding park management and decisions, as 17.1% strongly disagree and 14.3 % are not happy with Park management decisions + Majority of them (42%) never had a chance to meet Park management + Direct threats to locals and their properties by wild animal raiding and no compensation by the concerned departments + In surveys, 57.1% of respondents had frequent damages to their properties

2003). In the present study, the first 4 principles were the main focus in order to evaluate the current governance structure and highlight possible opportunities for a future effective governance model for protected areas in NWFP (Masozera et al 2006).

The community questionnaire survey data were entered into Microsoft Excel spreadsheets and analyzed by using the statistical package for the social sciences SPSS (SPSS 2007). Each question was treated as a separate variable, and percentages and frequencies of community responses were determined for each variable.

Results and discussion

The findings from our research were based on the SWOT analysis conducted through community questionnaires and key-informant interviews (Figure 4); the following sections reflect this structure.

Strengths

Chitral Gol National Park has attained global importance and recognition because of its rich biodiversity and historical significance. It plays a key role in ensuring the

effective management of endangered species by forced governance systems. This PA is designated by the Pakistan government as part of customary law and is managed by a government department through a hierarchical management system. People in this area have a very strong sense of belonging, and as the study reveals, most of the locals (85.7%) prefer their present life compared to life in the city. Local communities (100% in our surveys) know about the importance of the park; 68% are friendly with the park management, and the willingness of communities to participate in the management and protection of wildlife is high (97.1% of respondents). Chitral Gol National Park is funded by the government of Pakistan, receives some international funding, and is partially achieving its goals. The PA is audited by the auditor general of Pakistan and monitored by international funding bodies.

Weaknesses

Chitral Gol National Park is managed through top-down management by government departments with enhanced dependence on policing via a "fences and fines" policy of management. The study highlights how the majority of locals use park resources without being informed about the potential impacts of their actions on local biodiversity. In this context their behavior could be considered detrimental to the sustainability of the park. Our findings highlight the need for their inclusion in the land management decision-making process. The majority of the local people used the park for animal grazing and fuelwood collection. Development of alternative sources or education in more sustainable practices could minimize dependence on park resources.

Lack of a future plan or vision to enforce PA rules and mandates is a problem, as quantified representation of the data suggests that national parks have a very high protection status but experience a lack of strong vision for sustainable management. Chitral Gol National Park, declared in 1984, still has no management plan today, although "One was in progress during the time of the surveys" (Ashiq Ahmad Khan WWF-P, personal communication).

Government is the sole decision-making body and as such affects the transparency and sustainability of the system; hence, decentralization and participation in decision-making is suggested through a park management board. This necessitates stakeholders' identification with specified terms of reference needed to avoid ambiguity about their role as well as jurisdiction of power. There are also no strong interorganizational linkages or stakeholder participation consisting of academia, government, NGOs, and communities to make people aware of management of PAs. As neither academia nor NGOs are directly involved, PAs are faced with a lack of skilled manpower trained explicitly in biodiversity issues.

Lack of availability of information through print and electronic media makes it hard for other stakeholders and interest groups to keep up to date with management decisions.

Lack of independent monitoring, both of auditing and of governance, was revealed, which can affect the legitimacy and sustainability of the PA. There are some lands within the PA with unsettled ownership rights, which makes uniform management of the PA difficult. The PA is funded partially by government and international funding bodies, but uncertainty about adequate funding necessitates exploring alternative funding sources for sustainable maintenance of the PA.

Opportunities

Multistakeholder involvement in management with a consultative, cooperative decision-making structure is necessary to enhance transparency and sustainability. Our study suggests a joint advisory committee or board for each national park comprising major stakeholders (including community, academia, NGOs, and government departments) with clear terms of reference. Therefore, independent stakeholder analysis is suggested to streamline the key stakeholders and their limitations regarding obligations and responsibilities.

Our research suggests 100% of the respondents would like to be informed about the management and protection of the park, and 97.1% would like to participate in activities to protect park wildlife. Hence, we suggest incorporating locals into mainstream decision-making processes and formation of volunteer groups of local people, guided by the wildlife department, for constructive roles in various aspects of management and protection of the park. Exploiting the willingness of communities to participate in protection and management by directly giving them some responsibilities can increase the sustainability of the PA.

Coordination with academia and researchers to monitor species population dynamics and develop species action plans is very important. Capacity building of staff by providing in-service training and equipping them with up-to-date information (particularly new research) is also necessary. Training opportunities and access to the latest knowledge at all levels of PA management must also be provided. Our research suggests provision of information easily available and accessible to all the stakeholders. It is important for conservation organizations to run their campaign by adopting the most effective media. As this research suggests, television is the most suitable medium of communication. Awareness plays a vital role, and it has been suggested that better-informed people will be more helpful in adopting and becoming integrated into the awareness campaign (Pavlikakis and Tsihrintzis 2006).

We also suggest encouragement of direct share/benefits for community development from income-generating activities and a mechanism to compensate the losses that occur from wild animals. Provision of better living standards may in turn minimize the dependency of

local people on the park resources. Overall infrastructure in the area is improving through the efforts of various organizations, but much still needs to be done, as 17% of the households do not have a supply of drinking water. A high percentage of the people (34.3%) are linked to the tourism industry as their primary source of employment. Enhanced ecotourism could become an important source of alternative sustainable funding streams.

There is an influx of tourism in the area but a distinct lack of ways to heighten awareness of the importance of biodiversity. Our research suggests the establishment of a tourist information and resource center with trained local people. In addition to enhancing awareness, this will help build capacity and be a source of income for the local people. This finding also verifies the assumption that community involvement is vital for any effective conservation effort. The results from interviews suggest that the village communities consider local institutions such as Hujras, Betak, Jirga, religious institutions, and women's gatherings, which are centuries old and deeply rooted, as an influential medium of conveying management messages at the grassroots level. Researchers have suggested that religious and traditional institutions and leaders are influential within their local communities (Sheikh 2006), making it inevitable to ensure positive and constructive participation of these institutions. It is also important to include an awareness-raising program as a component in all conservation and development projects, with due consideration to community-established institutions, faith groups, and other local organizations by identifying ways of collaboration (Dudley et al 2005). Currently in Chitral Gol National Park, village conservation committees play a vital role, but these committees still do not have any direct access to management decisions. The general perception in the community is that village committees are simply forced to follow the decisions made for them by the government. These committees need to be strengthened and kept better informed about management decisions.

Independent monitoring of the PA, both of auditing and of governance, is crucial for the legitimacy and transparency of the PA. The PA management board and the park account committee consist of members from all key stakeholder groups and can increase the transparency, legitimacy, and hence, sustainability of the PA.

There is no evidence of long-term planning by the department of wildlife for the future direction of the park. Our research also suggests development of a visionary plan with both measurable short-term and long-term goals for the PA. Performance indicators should be established in light of the objectives of each PA.

Threats

The role of local communities is very important in the sustainability of these protected areas. As the study shows,

31.4% of the respondents do not consider the park management to be friendly; however, this perception could be due to lack of involvement in management activities, which leaves local people unaware of management decisions and why certain decisions are made. In addition, it is unclear to the local people what the benefits and relevance of these decisions are for the community. Our study also reveals a lack of awareness among villagers regarding national park boundaries and the location of their household with regard to these boundaries (*Supplemental data*, Appendix S1; http://dx.doi.org/10.1659/mrd.00024.S1). This necessitates active involvement of communities in the process of management planning and implementation (Bolland et al 2006).

A majority of the local people used the park for animal grazing, and incidences of attacks by leopards are reported to be common. Surveys show that 57.1% of the respondents reported frequent damage to their family or property by wild animals (*Supplemental data*, Appendix S1; http://dx.doi.org/10.1659/mrd.00024.S1). There is no meaningful compensation by the wildlife department for the loss of cattle. So in some cases locals adopt extreme measures such as poisoning the leopards. During the interviews, most of the local people demanded some compensation for loss of property. Other threats faced by the PA as investigated are:

- Conflicts among the stakeholders
- Conflicts due to unsettled ownership rights
- Overlap of jurisdiction of power with other departments
- Lack of sustainability
- Lake of adequate funding
- Habitat degradation
- Increasing human population
- Poaching
- Unsustainable forest harvesting
- Lack of community participation
- Lack of interdepartmental coordination
- Weak capacity and lack of financial resources
- Climate change
- Invasive species

Conclusions and recommendations

This research, conducted using community questionnaires and key-informant interviews, suggests that the future model for the governance of these areas should be based on a multipronged approach to involve the majority of stakeholders (identified after a key stakeholder analysis for the park) in the decision-making process of park management, as explained in Figure 5.

In short, the main recommendations for sustainable governance of the PAs in NWFP are the following:

FIGURE 5 Proposed PA management structure resulting from the lessons learned during the study.
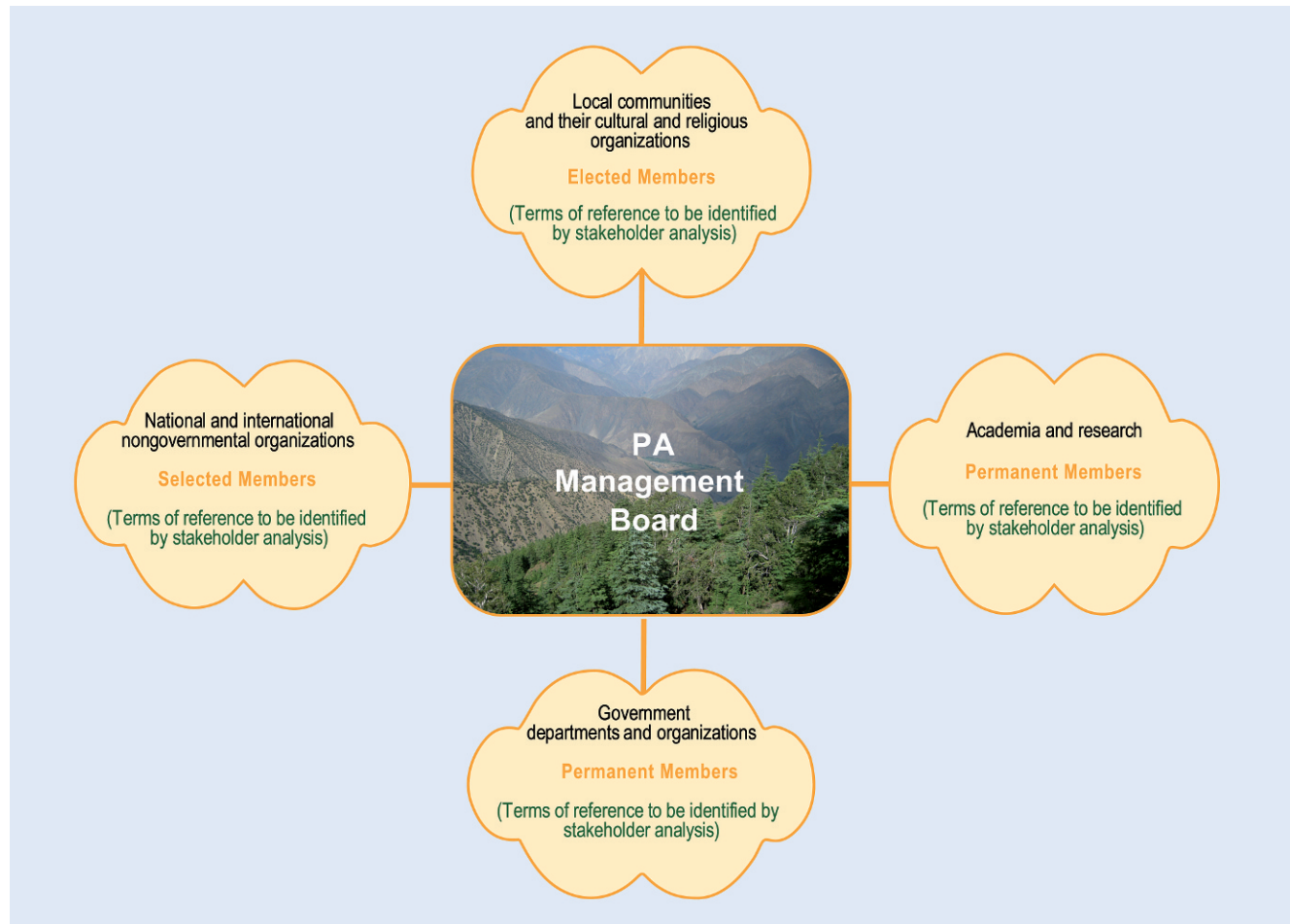
1. Mass awareness programs regarding the importance and conservation of biodiversity in the periphery of PAs and its extension to the adjacent districts using effective media (mainly electronic media) in various languages. This is necessary for closer involvement by the local communities in protected area governance.

2. National- and provincial-level policy advocacy for inclusion of environmental subjects and themes in academic curricula and the introduction of multidisciplinary courses on contemporary issues in conservation in the adjacent universities (Peshawar University, Malakand University, Hazara University, etc). Such involvement of local universities in research will be essential to generate a broad knowledge base (natural and social sciences) for effective planning and management of protected areas.

3. Establishment of a park management committee (Figure 5) involving equal representation of community organizations, academia, NGOs, and other relevant departments for decision-making regarding park

management. This may also include a park account committee to take care of the finances. Such a heterogeneous structure for decision-making will ensure fair representation of all stakeholders in protected area management and governance.

4. Recognition of the importance of stakeholder analysis for each national park to streamline the role and responsibilities of individual stakeholders. This is particularly important given the regional variation and diversity of stakeholder communities in the protected areas of NWFP.

5. Understanding of the past dynamics of landscapes in order to make the protected areas resilient in the face of global environmental change and to account for future threats in protected area management. This also necessitates baseline information on past landscapes and models for future predictions.

6. Involvement of local students and researchers in research initiatives in the parks gained by offering small-scale internship opportunities for research

projects integrated within the curriculum. This in turn will help capacity building in the region and ensure the long-term sustainability of research in these remote and otherwise inaccessible areas.

7. Initiation and encouragement of local volunteers in various organized group activities such as bird-watchers, awarding prizes for productive participation. This in turn will create strong community involvement and effective ways of communicating conservation messages.

8. Establishment of a small fund with community contributions as insurance to compensate for partial losses of livestock due to depredation by large carnivores within protected areas. This will ensure that the victims are compensated quickly for any such losses.

9. An up-to-date, web-based source (website) for each park in the region where the relevant documents/literature are easily accessible to all stakeholders (currently there is a lack of online literature regarding these protected areas). This is particularly important for transparency in protected area management.

In conclusion, we suggest that protected areas are essential for the conservation of biological diversity in this region. We also suggest that the protected areas will only be effective if the management of land around them is also taken into consideration. Therefore, for effective management of these areas, local people need to be better informed about the objectives of protected area management. The success of management will depend on accountability, legitimacy, transparency, and vision in protected area governance.

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Supplemental Data

APPENDIX S1   Survey questions and percentages of community responses.

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