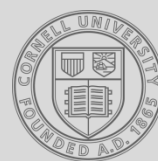


Conservation in Bhutan

Revising the Management Plan of Jigme Dorji National Park in Bhutan



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Part 1: Introduction



Specific Goals

Compile a list of potential donors

First, we researched potential partners for Jigme Dorji National Park (JDNP) projects. These include donors and linkage institutions specifically interested in issues addressing the park and operating or potentially operating in Bhutan. Donors were then packaged and synthesized into a usable list that can be a resource for management.

Conduct a literature review of

- **Climate Change**
- **Adaptive Capacity**
- **Community Based Natural Resource Management**

These three concepts lie at the heart of the issues facing JDNP. A thorough literature review creates the backbone of the report going forward. The findings from the literature are then synthesized into our interpretations of the concepts as they relate to JDNP.

Review and discuss case studies relevant to JDNP

The specific focus of this goal is on community forestry in Nepal. An exhaustive analysis of community forestry programs was completed to generate potential measures for use in JDNP.

Suggestions for integration of ideas into JDNP management plan

Ideas, concepts, and tools from journal articles, textbooks, and other literature are synthesized into a set of recommendations for JDNP. These concepts are narrowed from literature reviews considering the specific constraints and opportunities within JDNP.



About the Park

Overview

The Jigme Dorji National Park (JDNP) is Bhutan's second largest national park measuring 4,316 km². Founded in 1974, the park protects religious sites, historical sites, glaciers, and many endangered species of flora and fauna. It is also noted for the range of altitudes that it covers, covering all three climate zones in Bhutan, stretching between 1,400m to 7,000m. Originally designated as a wildlife sanctuary, the area became a national park following a wave of conservation legislation in 1993. The conversion into a national park meant a significant reduction in the park's size, but came with more stringent controls on conservation. Originally, the park stretched the entirety of Bhutan's northern border. Currently, the park controls the north-western part of the country, sharing a border with China on its northern side (Ministry of Agriculture, 1997).



(Retrieved from Google Maps, 2013)



Biodiversity

The park is considered to be one of, if not the most, essential haven for biodiversity in the country. JDNP contains 36 species of mammals, 328 birds, 5 reptiles, 39 butterflies, and over 1450 species of vascular plants, many of which are endangered, threatened, or vulnerable. The site's notable claims to universal value are so important that it has been designated as a UNESCO World Heritage site for the following criteria (UNESCO, 2012):

- “It is the only park in the world where the Royal Bengal Tiger (*Panthera tigris tigris*) meets the Snow leopard (*Uncia uncia*).
- The park where the Royal Bengal Tiger (*Panthera tigris tigris*) was recorded at 4200 m and the highest recorded among the Tiger Range Countries.
- It is the only park in Bhutan where largest populations of Bhutan Takin (*Budorcas taxicolor whitei*) thrive.
- The only park where all the Bhutan's four National Symbols, tree; Cypress (*Cupressus corneyana*), flower; Blue Poppy (*Meconopsis grandis*), bird; Raven (*Corvus corax*) and animal; Takin (*Budorcas taxicolor whitei*) are found.
- In addition, it is the only park in Bhutan where largest number of international tourists trek through the paradisiacal alpine meadows and snow-capped mountains.
- Furthermore, it is Bhutan's only park with the largest number of hot springs and medicinal baths.”

In addition to the notable presence of tigers and leopards, the park houses Himalyan blue sheep, red panda, dhole, barking deer, and many other animals with cultural significance.



Human Factors

Another element in JDNP is the presence of a local population of both indigenous and non-indigenous peoples and their interaction with local and national governments. There are approximately 6,500 people living in 1,000 households throughout the park. Locals are primarily subsistence farmers; 80% of Bhutan as a whole relies on subsistence farming (Ministry of Agriculture, 1997). In the northern range of the park, the sale of animal products constitutes the highest percentage of livelihoods. In the southern range though, practices stray from pastoral roots into agriculture and contract labor.

Politics have also had a significant impact on human life within national parks. In 1993, conservation policy in the Bhutan made a major shift. The government mandated that 60% of the country is to be covered by forest at all times. This meant that 40% of the country's land area (38,394 km²) was specifically set aside for conservation. These measures of protection of nature were essential to Bhutan's efforts in pursuing Gross National Happiness. JDNP itself was converted into the more protected classification of national park in 1993, although people were still allowed to live there. Restrictions were placed on traditional resource uses in the Bhutan Forest and Nature Conservation Act of 1995, although they provisioned for the allowance of most subsistence activities. All hunting or any other type of trapping or killing of wild animals is expressly prohibited. Grazing on forest produce is also banned. There are provisions for enclave and buffer zones though, that permit some level of resource use, while preserving the forest (Ministry of Agriculture, 1997).



Issues

Human Wildlife Conflicts

The proximity of human populations and JDNP's level of biodiversity has created conflict between some of the stakeholders. A common scenario is a farmer's cropland or livestock are destroyed by local wildlife. Park regulations prohibit the farmer from killing the offending animal, but in many cases, they are. These predatory animals include many of the critically endangered mammals that the park seeks to protect, including tigers, leopards, and dholes. This puts park management at odds with the interest of the farmers. The issue may be growing as well due to an increase in human populations. It is compounded by the lack of resources available to farmers to protect their livestock and crops.

An estimated 5% of the park is classified as agricultural land. Most of this is within enclave zones, which constitute less than 3% of the total land area of the park (Natural Conservation Division, 2003). There are also fairly significant tracts set up for seasonal grazing zones. The enclave, buffer, and seasonal grazing zones are where human predator interactions occur. Although human injuries from wildlife are rare, livestock are commonly killed. During a course of nine months, a pack of dholes killed 24 mules, six cattle, and two yaks within the park (Anon., 2003). These types of interactions have put pressure on farmers to protect their land, spreading their small resource base even thinner. It is estimated that the average farmer spends two months per year guarding their maize and rice from wildlife (Choden and Namgay, 1996). Pressures from wildlife have been driving many farmers out of agriculture into other areas or forcing them to leave the park in search of employment. The challenge moving forward for JDNP management is how to balance conservation priorities with the rights of the human populations living within the park's boundaries.



Why the Plan Needs To Be Updated

The express goal of the project was, “What new elements should Jigme Dorji National Park insert in the new management plan to adapt to the changing socio-cultural and biophysical settings in Bhutan and in the Himalayan sub-region?” The prompt itself suggests that socio-cultural and biophysical settings are changing. Politically, Bhutan is slowly shifting into democracy. This means a greater focus on involving people in decisions that affect their livelihood. Practices such as Community Based Natural Resource Management and community forestry may fulfill this need. Biophysically, this report will discuss how global climate change is affecting Bhutan and other protected areas. These changes warrant a reaction from park management to mitigate the damages from climate change.





Part 2: Community Based Natural Resource Management



Introduction

Definition of Community Based Natural Resource Management

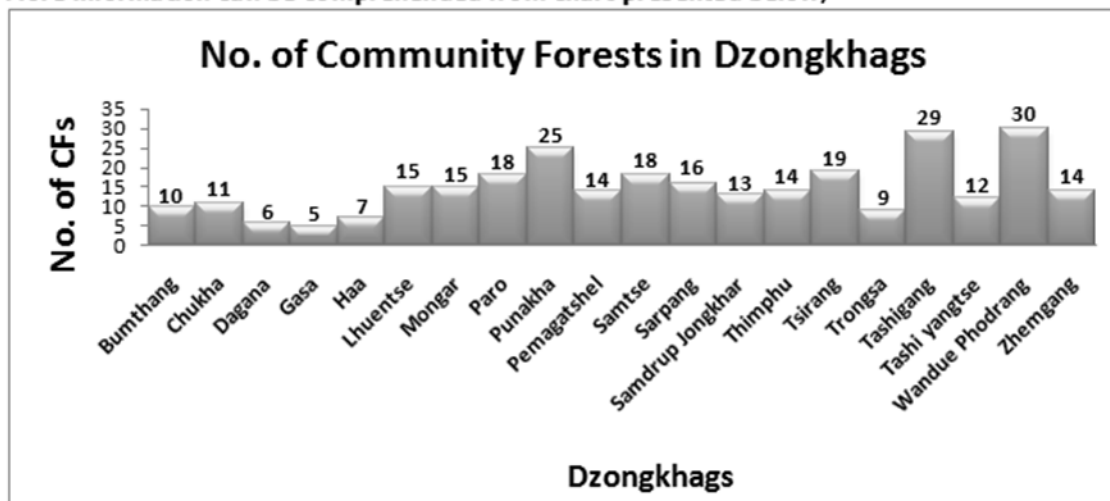
Community based natural resource management (CBNRM) is a viable conservation initiative for Bhutan's new transition to a democracy in which public participation is an evolving aspect. CBNRM is defined as environmental management that involve a wider variety of local stakeholders in all aspects of decision-making including planning, implementation, and regulatory and enforcement processes (Barrett et al. 2001; Borrini-Feverband, 1996; Gruber, 2010; Pomeroy, 1996). Some potential benefits of CBNRM include: local stake and pride in a project's outcome, greater project visibility, more productive resource base, potential support for local livelihoods, political empowerment, new channels of communication with government agencies, and non-governmental organizations, and technical and managerial capacity building (Shackleton et al., 2003). However, there are also potential drawbacks to this type of management including: informal power relationships, assuming locals have lasting stake in the community, assuming sufficient management capacity, assuming homogeneous communities, difficulty integrating indigenous knowledge into practice, poor historical relationships between communities, and opportunity costs to community members (Berkes, 1998; Brosius et al., 1998; McCay & Jentoft, 1998; Kellert et al., 2000; Barrett et al., 2001; Li, 2002). These challenges should be addressed during the planning processes while forming a CBNRM plan in Bhutan.



Definition of Community forestry

One form of CBNRM, community forestry management, could be a practical approach for environmental conservation for Bhutan. This is feasible option due to Bhutan's Forest and Nature Conservation Act that encourages "social forestry" and sets the legal framework for community forests (CF) as "any area of a Government Reserved Forest designated for management by a local community" (The Forest and Nature Conservation Act of Bhutan, 1995). Community forestry transfers ownership of forest produce into the hands of community members bordering the forest (The Forest and Nature Conservation Act of Bhutan, 1995). This type of management can result in social, environmental and economic benefits for those involved by increasing a sense of ownership, improving local governance, developing social cohesion, improving forest quality, and increasing community income through the sale of forest products (Chhetri et al., 2009). Community forestry began in 2000 and as of March 2011, there are 300 approved CFs in Bhutan located across various Dzongkhags (Tempel & Beukeboom, 2007; Tshering, 2011). These CFs include a total of 14,103 households (Tshering, 2011).

More information can be comprehended from chart presented below;



(Tshering, 2011)

Dzongkhags refers to judicial districts of Bhutan



The success of community forestry in Bhutan has not been widely assessed, however, in nearby Nepal, community forestry has been extensively researched.

Community forestry practices began in Nepal as a solution to an increasing human population causing extensive forest degradation (Chhetri et al. 2013; Pandit & Bevilacqua, 2011). Since 1978, community forestry has been utilized as a way to engage the local people in natural resource management, and as of August 2009, 22 percent of total forest area is managed as community forests (Pandit & Bevilacqua, 2011). The lessons learned from community forestry in Nepal can be utilized to inform management decisions in Bhutan based on the social, political and ecological similarities between the two countries.



Application in Nepal

Ecological Success

Community forestry practices have been largely successful at environmental conservation in Nepal. Pandit & Bevilacqua studied eight CFs, with at least five years of community forestry practices within the Dhading district, evaluating their success over a five-year period (2011). They found that the availability of firewood and fodder, and the stocking of saplings, poles and trees increased (Pandit & Bevilacqua, 2011). Furthermore, the number of plant and wildlife species recorded over the five-year period increased, indicating an improvement in biodiversity (Pandit & Bevilacqua, 2011). These findings were in agreement with other various studies from the Dhading district claiming ecological improvement from community forestry practices. For example, Fisher et al. found that community forestry increased water yield and wildlife populations (2002). Additionally, Shrestha et al. found the total degraded forest areas decreased and managed forest areas increased (2010). In other locations across Nepal, studies have consistently found positive environmental impacts of community forestry practices. Church found increased tree growth and regeneration, improved ground cover, increased soil moisture retention, reduced soil erosion, and better wildlife habitat as a result of community forestry practices (1995). Other evidence of successful community forestry practices includes regeneration of degraded forests, slowing down of the deforestation rate, and increased mean tree height and crown density (Adhikari et al, 2004; Branney & Yadav, 1998; Nash, 2000; World Bank, 2001)

The ecological success of community forestry practices is due to wide variety of reasons that should be considered as Bhutan expands their reliance on community based forest management. For one, the active involvement of local communities in forest management created a sense of pride and shared responsibility among community members, which resulted in more sustainable use practices (Pandit & Bevilacqua, 2011). Secondly, environmental education in communities about the impacts of forest degradation in Nepal enhanced community forestry practices (Pandit & Bevilacqua, 2011). Finally, effective enforcement of rules and regulations in the implementation phase



eliminated free riding in the forests and led to forest regeneration (Pandit & Bevilacqua, 2011). These reasons that helped lead to the success of community forestry in Nepal should be considered during the planning processes of community forestry management plans within Bhutan.

Social, Economic, and Technical Challenges

While community forestry practices in Nepal have led to environmental improvement, there are also challenges that should be addressed before implementation within Bhutan. Community forestry practices have had limited success at improving rural livelihoods in Nepal. The local elite often takes control of community forestry user groups leaving the poor and women left out of decision-making (Thoms, 2008). Government foresters target the elite during implementation because the wealthy tend to have higher education and can afford the opportunity costs of meeting with foresters (Thoms, 2008). The poor and women are left out of decision-making and end up incurring the costs of community forestry due to the restrictions on collecting forest resources, in which they do not have substitutes for (Thoms, 2008). Furthermore, community forestry often does not provide adequate revenue for the surrounding community due to the limited amount of forestry products (Gurung et al. 2012). This limited opportunity for community development is exacerbated because local users are unaware of market opportunities so non-traditional forest products (NTFPs) are sold cheaply in a local market or consumed at the local level (Gurung et al. 2012; Thoms, 2008). The potential profit from NTFPs could be utilized for community development and livelihood improvement (Thoms, 2008). Another challenge of community forestry in Nepal is a lack of technical capacity of community forestry management, including government agencies and local villagers (Gurung et al. 2012; Thoms, 2008). Many villagers are illiterate and do not have specialized training to conduct proper forest management (Thoms, 2008). These challenges also exist in Bhutan.





Part 3: Climate Change and Adaptive Capacity



Climate Change in Bhutan and JDNP

Introduction

Like its counterparts around the globe, JDNP is looking into a future where the effects of climate change will determine the direction of and success of its management. An article by the National Environment Commission released estimates gathered from 21 different global models that Bhutan will see a 3.3° Celsius degree median increase by 2100, with the largest warming range taking place in higher altitudes as snow and ice melt (NEC, 2009). This article also predicts that there will be a 5% decrease in precipitation during Bhutan's dry season and an 11% increase in the wet season (NEC, 2009). Although these estimates are based on models with an unpredictable accuracy, there is no doubt that Bhutan and JDNP will feel the effects of climate change in the future.

Climate change- People

Climate change negatively impacts humans in many ways, including decreased access to water for consumption and agriculture, increased natural disasters, and increasingly unpredictable agricultural seasons. These negative impacts are especially harsh for the subsistence farmers that live in and around JDNP as they are remote, low income, and have little awareness or capacity to deal with the effects of a changing climate. The people and communities in this area of Bhutan already face many challenges and adding climate change into the mix will exacerbate those existing economic, political, and humanitarian stresses.

Climate Change- Animals and Plants

The effects that climate change have begun and will continue to impact plants and animals in many ways. One of the most important impacts climate change has on plants and animals is the range shift that temperature increase drives. As the median



temperature increases, the ranges of plants and animals species shift ‘polewards’, mountain based species shift their range higher in elevation, migratory patterns change, and spring migration occurs earlier (Welch, 2005). Plants and animals will also face increased threats from invasive pests, pathogens, weeds, and vector borne disease as their ecosystems experience climate change. Changes in physiology, phenology, interspecific interactions, and disturbance regimes in animal and plant species have already been linked to climate change and will continue to occur as the impacts of climate change increase (Lawler, 2009).

Climate Change- Landscapes and Ecosystems

Global climate change affects all levels of an ecosystem. Mountainous forest landscapes, such as JDNP’s, are threatened particularly by floods, landslides, forest fires caused by increased lightning strikes, loss of glaciers, and permafrost melt. (NEC, 2009; Welch, 2005). Once an area feels the effects of climate change, it is unlikely that the entire ecological organization will migrate in step, meaning that there will be many novel biomes and increased dominance of pioneer species in the future (Welch, 2005).

Climate Change- Protected Areas

Protected area management is already riddled with unknown variables and complex systems but climate change makes management even more unknown, complex, and unpredictable. When looking into a future that includes the effects of climate change, managers of protected areas have to make decisions based on limited and uncertain projections of the future impacts. Because protected areas are geographically fixed, they are often poorly suited to protect the species and environments they were created to (Peters and Myers, 1991 as cited in Hannah et al., 2007). As Welch suggests in the article “What should Protected Area Managers do in the Face of Climate Change?”, protected area managers should seek ways to adapt their management practices to help maintain biodiversity and natural processes and to assist nature through its inevitable transitions (Welch, 2005).



Helping protected areas survive and thrive through climate change is a huge challenge that managers face, especially in Bhutan. In Bhutan, there is a lack of technical knowledge of climate change, limited research and little capacity to increase it, and many of the national policies do not include climate change planning or long-term goals (NEC, 2009). To reap the rewards of innovative adaptation programs, institutional capacity, data collection capacity, and coordination between institutions are needed, yet all of which are missing in Bhutan (Meenawat & Sovacool, 2010). Although JDNP faces barriers when it comes to adapting to climate change due to Bhutan's lack of capacities, there is the opportunity with the creation of a new management plan to include strategies that will improve the park's ability to adapt to climate change in the future. Increasing JDNP's ability to cope with climate change includes reducing the park's vulnerability and increasing the resilience and resistance capacity.



Adaptive Capacity

Introduction

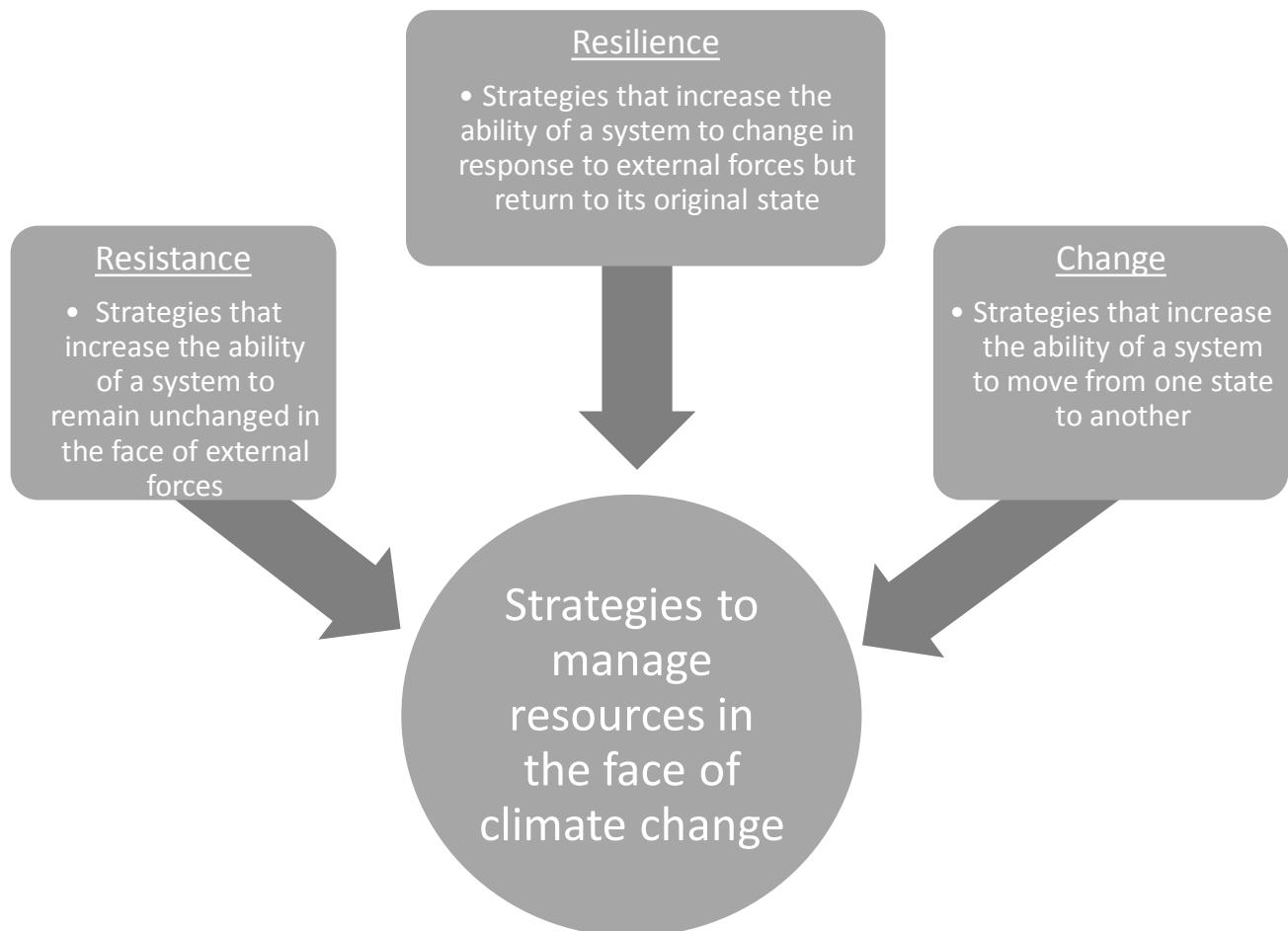
The idea of adaptive capacity is key when discussing a protected area's adaption to climate change. Adaptive capacity is built by creating a flexible framework to adjust for changes in the political, social, and ecological spheres in the face of wicked problems, such as climate change. There are a huge number of strategies used to increase adaptive capacity, some of which will be discussed below.

Overview of adaptive capacity strategies/recommendations

Management plans that do a good job of increasing an area's adaptive capacity will, 1. be customized to the area, 2. integrate different disciplines (social, political, economic, environmental, infrastructure), 3. work to build human, institutional, research, and environmental capacity, and 4. focus on and prepare for the future. An example of a climate change adaptation program that was successful in Bhutan is the glacial flood control project that was started in 2008. This program worked on physically lowering the level of the glacial lakes using infrastructure but also worked to create an early warning system, educate in local communities, and train government planners on local and national levels on district disaster committees (Sovacool et al., 2012). This project is a successful example of increasing adaptive capacity in the face of climate change because it was acting on many levels to diversify the impacts it had on stakeholders.

Specific strategies can fit into three broader categories of theoretical approaches to increasing adaptive capacity of an area: resilience, resistance, and change (Miller et al., 2007 as cited in Lawler, 2009). The graphic on the next page defines the goals of strategies under each category.



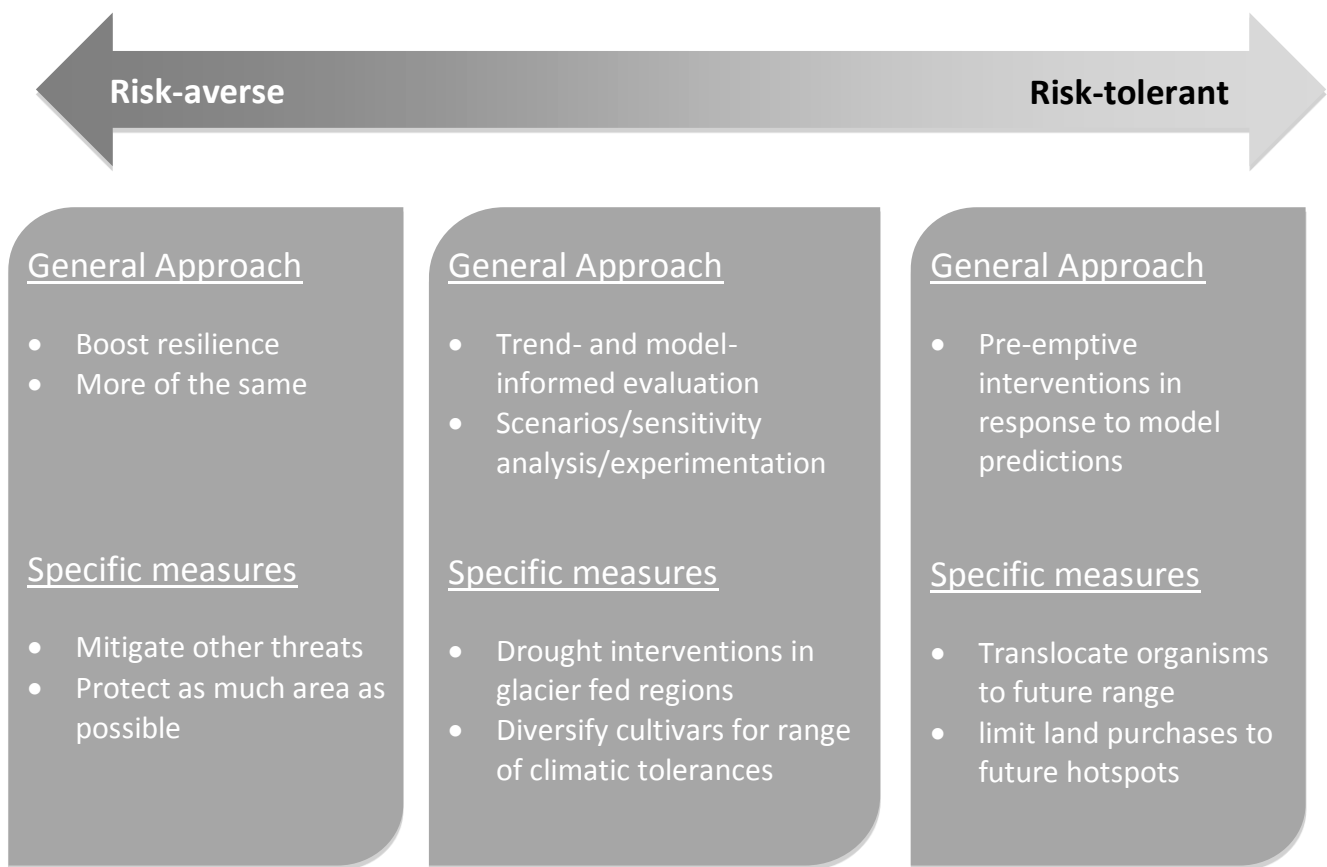


(Lawler, 2009)

A first step for managers when attempting to write adaptive capacity strategies into management plans will be to wrestle with the question of when they will attempt to resist biotic change, or rather, will they choose strategies to increase resistance or resilience. An example of a management strategy that promotes resistance would be adding irrigation if precipitation declines. On the other hand, introducing a wider range of genotypes is a strategy that promotes resilience in the system. As evidenced by the recommended strategies listed in the next section of this paper, resilience strategies are much more common than resistance or change strategies. Strategies that promote change are not very common at all but deserve to be mentioned as the counterpoint to resilience and resistance strategies. (Heller and Zavaleta, 2009)



Not only do strategies to increase adaptive capacity in the face of climate change fit into three theoretical categories, resilience, resistance, and change, they also fit along a spectrum of 'Risk-averse' to 'risk tolerant'.



(Heller and Zavaleta, 2009 page 27)

Depending on the level of impacts already being seen in the protected area, the category of threat being faced, and other factors, managers will choose strategies along this spectrum of risk-averse to risk-tolerant.



Literature Review of Adaptive Capacity Strategies

Introduction

This section focuses on 4 papers that included literature review compilations of recommendations for protected area management adaptation in the face of climate change. It is important to note that these four papers mentioned that most recommendations collected from previous literature were classified as general and not actionable, meaning that climate change adaptation seems to still be in the ‘idea stage’.

Heller and Zavaleta, 2009

The first paper, authored by Nicole Heller and Erika Zavaleta, recorded 524 recommendations from 113 papers. The recommendations were ranked by the number of articles that mention the particular strategy as an adaptation recommendation. Based on this ranking system, the top five strategies are:

1. Increase connectivity (design corridors, remove barriers for dispersal, locate reserves close to each other, reforestation)
2. Integrate climate change into planning exercises (reserve, pest outbreaks, harvest schedules, grazing limits, incentive programs)
3. Mitigate other threats (invasive species, fragmentation, pollution)
4. Study repose of species to climate change/ practice intensive management to secure populations/translocate species
5. Increase number of reserves.

The conclusion of this article is that the majority of recommendations lack sufficient specificity to direct immediate action to adapt management plans. Another important conclusion from this paper is that recommendations to date have neglected social science which is concerning considering the obvious importance of humans in



protect area management and increasing popularity of multi-use public and private lands (Heller and Zavaleta, 2009).

Mawdsley et al., 2009

The second article, authored by Mawdsley, O'Malley, and Ojima, describes 16 possible adaptation strategies that have been proposed in the scientific literature and in public policy documents. Those strategies were grouped into four broad categories as follows:

1. Strategies related to land and water Protection
 - Increase extent of protected areas
 - Improve representation and Replication within protected area networks
 - Improve management and restoration of existing protected areas to facilitate resilience
 - Design new natural areas and restoration sites to maximize resilience
 - Protect movement corridors, stepping stones, and refugia
 - Manage and restore ecosystem function rather than focusing on specific components
 - Improve the matrix by increasing landscape permeability to species movement
2. Strategies related to direct species management
 - Focus conservation resources on species that might become extinct
 - Translocate species at risk of extinction
 - Establish captive populations of species that would otherwise go extinct
 - Reduce pressures on species from sources other than climate change
3. Strategies related to monitoring and planning
 - Evaluate and enhance monitoring programs for wildlife and ecosystems
 - Incorporate predicted climate change impacts into species and land management plans, programs, and activities



- Develop dynamic landscape conservation plans
 - Ensure wildlife and biodiversity needs are considered as part of the broader societal adaptation process
4. Strategies related to law and policy
- Review and modify existing laws, regulations, and policies regarding wildlife and natural resource management

The conclusion of this paper is that the strategies mentioned above will most likely look like 'business as usual' to most managers, and even the new activities are based on existing approaches. This is encouraging because it means that we already have the tools to deal with these problems but discouraging because in reality, climate change will force rapid and innovative action, not re-hashing of old approaches and ideas.

(Mawdsley et al., 2009)

Lawler, 2009

The third paper, authored by Jashua Lawler, serves as an introduction to the overall recommendations of adaptation strategies but also lists some specific actions that can be used for terrestrial systems in the face of climate change:

- Broaden the genetic variability and species diversity of managed sites
- Aggressive forest-management: for example, widely spaced thinning and shelterwood cuts may allow forest stands to withstand increased insect outbreaks and fires
- Manipulative management strategies, such as, moderate grazing to increase the hydro period in vernal pools threatened by increasing temperatures and decreasing precipitation
- Placement of snow fences to increase snow pack in areas where sensitive alpine plant communities are threatened by reduced snowpack
- Invasions by nonnative species may be minimized through vigilance, early detection, and aggressive removal



This paper's recommendation list includes much more specific recommendations than those from the first two, yet none of these approaches are new, most action strategies are the basic, accepted strategies for protecting biodiversity in a protected area. (Lawler, 2009)

Welch, 2005

The final paper that was used as a literature review compilation of recommendations was authored by David Welch. Most of the recommendations that were directly listed in this paper are included below:

- Regional modeling of biodiversity response to climate change.
- Incorporation of climate change as a factor in the selection of protected areas.
- Regional management of biodiversity, including core protected areas and landscape connectivity.
- Local to international coordination of protected area management.
- Represent vegetation types and diverse gene pools across environmental gradients in reserves.
- Protect climatic refugia at all scales.
- Avoid fragmentation and provide connectivity.
- Provide buffer zones for the adjustment of reserve boundaries.
- Maintain natural processes and successional regimes.
- Conduct research to identify sensitive biomes.
- Conduct long-term monitoring to seek causality between climate and biodiversity responses at several levels of organization
- International exchanges of ideas between researchers and managers.
- Strengthen the research capacity of parks personnel.
- Involve local communities.
- Use parks as benchmarks for long-term monitoring.
- Determine the necessity to transplant species, or to control rapidly increasing species.



- Locate parks with climate change in mind, develop contingency plans to expand conservation areas, and protect or establish connecting corridors.
- Use active adaptive management and strategy testing.
- Integrate climate change threats into conservation plans.
- Plan protected areas with disaster mitigation in mind.

This paper is extra valuable because it includes the author's opinion on what not to do:

- Do not move the parks to anticipated biomes
- Do not use parks to buffer or mitigate other impacts
- Do not modify natural region boundaries to fit future biomes

The conclusion of this paper is that a good network of protected areas free of other stresses is the best adaptation to climate change, and protected areas should play a leadership role to ensure that nature survives climate change.

(Welch, 2005)

Conclusions

Climate change will impact every aspect of JDNP in the near future and it is in the best interest of all stakeholders to include strategies to prepare the park for these changes in the new management plan. The way that we recommend JDNP change its management in the face of climate change is to introduce strategies to increase the adaptive capacity of players and elements of the park. After conducting a literature review of compiled strategies to increase adaptive capacity, it is obvious that there are too many strategies out there to all be feasible for a particular park. Due to this large number of listed recommendations, a truncated list appears in the Recommendations section.



Part 4: Recommendation for Bhutan



Recommendations for CBNRM

Community Forestry in Bhutan

Bhutan must address the challenges represented in community forestry practices in Nepal to ensure this type of management is successful, not only at conservation but development goals too. In Bhutan's current 10th Five Year Plan, poverty reduction is the primary goal and community forestry represents an important tool to achieve this goal, while ensuring conservation (RGoB, 2009). Thoms recommends organizing CFUGs into tols, or neighborhoods, in which every hamlet would have a representative in meetings, including a certain number of women representatives (2008). This would ensure lower income households and women are represented in decision-making. Government foresters should ensure the local poor and women participate during formation and implementation of community forestry projects to determine their forest needs and encourage their participation in future decisions (Thoms, 2008). Better allocation of funds to the poor and communal benefits through infrastructure should also be considered so the local poor benefit from community forestry (Chettri, 2009; Gurung et al., 2012; Thoms, 2008). One project in Nepal allocated 35% of the community forestry fund for the local poor, especially those who typically depend on natural resources (Gurung et al., 2012). Transaction costs for the poor should also be minimized so that they can have an active role in decision-making (Chettri, 2009). Relaxing rules on meeting attendance for the lower income households can minimize transaction costs, but still allow for an equal say in decision-making processes. Furthermore, Gurung et al. recommends skill-oriented training to increase technical capacity and result in better management practices, which could result in higher productivity and sustainable extraction (2012). Marketing, pricing and timber business training could maximize the commercial sale of timber from CFs and add value to the forest products through timber processing activities resulting in an increase to the community's income (Chettri, 2009). Increasing the total revenue from forest products will also aid in poverty alleviation goals because there will be more money to allocate directly to the community or to community projects.



Other general recommendations for CBNRM should also be considered when revising JDNP's management plan. These include: providing participation at all stages, seeking agreement among stakeholders, providing incentives for participation, and strengthening locally developed institutions (Folke et al. 2003; Gruber, 2010; Hitimana et al. 2006). CBNRM will likely have a greater success rate in Bhutan if these recommendations are taken into account.



Recommendations for Adaptive Capacity Strategies

Changes feasible for JDNP

We recommend that the following strategies be incorporated into the new management plan to increase adaptive capacity in the face of climate change:

- Incorporation of climate change as a factor in the selection of protected areas
- Regional management of biodiversity including core protected areas and landscape connectivity, avoid fragmentation
- Involve local communities, help to diversify their livelihoods, and use all knowledge bases
- Use parks as benchmarks for long-term monitoring of climate change
- Control rapidly increasing invasions by nonnative species through vigilance, early detection, and aggressive removal
- Improve management and restoration of existing protected areas to facilitate resilience
- Reduce pressure on species from factors besides climate change
- Strengthen the research capacity of parks personnel.

Changes not feasible for JDNP

We do not recommended the inclusion of the following recommendations for JDNP:

Due to a lack of capital for the park's management and limited institutional and research capacity, we do not recommend:

- Any intensive amount of modeling such as regional modeling of biodiversity response to climate change
- The translocation of any species



Due to the unpredictable nature of climate change, we agree with Welch (Welch, 2005) in not recommending:

- Moving the parks to anticipated biomes
- Using parks to buffer or mitigate other impacts
- Modifying natural region boundaries to fit future biomes



Part 5: List of Potential Donors



Donations and Protected Areas

Introduction

One of the largest challenges in maintaining a protected area is obtaining enough funds to sustain financing over the long term. Protected areas tend to suffer from an insufficient amount of investments from outside corporations, which can be detrimental alongside of an inability to generate funds in-house (Emerton, Bishop, & Thomas, 2006). Donors are reluctant to give to protected areas because often the funds are put towards covering administrative costs as opposed to going directly to conservation projects, which places further disincentives on potential donors for protected areas (Emerton, Bishop, & Thomas, 2006).

Funding comes to protected areas that have a clearly defined goal, and structure set up to succeed in their conservation endeavors. This scenario is found more prominently in developed countries over the developing countries, with the majority of the \$6.5 billion flowing into conservation efforts every year, going to America or Europe (Emerton, Bishop, & Thomas, 2006). Much of this disparity is attributed to the countries' GDPs, and what percentage of their government budget has been dedicated to conservation efforts in protected areas (Emerton, Bishop, & Thomas, 2006). In these countries, there is also a far larger base of individuals with the disposable income to donate to the organizations that ultimately give out grants to protected areas (Emerton, Bishop, & Thomas, 2006).

A growing issue with obtaining funding for protected areas is that the amount of land under this classification has grown at an unprecedented rate over the last decade. As many countries become privy to the necessity of conservation In order to gain funding, developing and small nations need to target donor organizations with varying ties to their specific conservation goals and overarching conservation efforts, as well as organizations that can help the protected areas develop sustainable management practices (Emerton, Bishop, & Thomas, 2006). Prior to reaching out to these organizations for donations, protected areas must work to do the following:

- Define their protected area and conservation needs
- Decide on the level and type of funding needed
- Identify current capital that is of use to them
- Create prioritized list of projects that need funding with cost estimates to present to potential donors (Emerton, Bishop, & Thomas, 2006)



Potential Donor Criteria

In the next section we have compiled a list of donors that we feel have potential to be important starting points for generating donations for the Jigme Dorji National Park. We made sure that each of the organizations met at least one of the following criteria:

- Current Involvement in Bhutan
- Funding reserved for conservation projects
- Focus on- big cats, climate change, biodiversity, human-wildlife conflict

Our searches drew us to three distinct types of donor organizations:

- Non-Governmental Organizations
- Companies with corporate social responsibility programs
- Private Foundations



List of Potential Donors

Ranked in order of likelihood of success

World Wildlife Fund:

- The WWF was established in 1961, and focuses on conservation efforts around the world. They currently have projects set up in Bhutan, and do offer grants of varying amounts to conservation efforts in small nations. It is important to focus on the wildlife conservation efforts that are being made in Jigme Dorji National Park when asking for funding, as this is their main area of focus.
- **Mission:** To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by: conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.
- **<http://worldwildlife.org/projects>**
 - Contact: WWF Bhutan Program
 - Kawajangsa Post Box 210 Thimphu: Bhutan
 - +975-2-323528/323316/321407 (P) 323518 (F)

The Aga Khan Foundation (AKF):

- Founded in 1967. Has a strong volunteer base in India, where it has innovation projects already in place. They are willing to expand outward, but do look for places that have man power, and that have a strong focus on mitigating rural poverty. Would be a significant partnership to obtain to assist in the development of a community based natural resource management program that will help the local farmers progress economically.
- Focuses on a small number of specific development problems by forming intellectual and financial partnerships with organizations sharing its objectives. Most Foundation grants are made to grassroots organizations testing innovative approaches in the field. With a



- small staff, a host of cooperating agencies and thousands of volunteers, the Foundation reaches out to vulnerable populations on four continents, irrespective of their race, religion, political persuasion or gender.
- <http://www.akdn.org/akf>
 - Contact: Aga Khan Foundation
 - 1-3 avenue de la Paix
 - P.O.Box 2049
 - 1211 Geneva 2
 - Switzerland.
 - (+41-22) 9097200
 - (+41-22) 9097292

The Mountain Institute: the Himalayan Program:

- Founded in 1972, the Mountain Institute focuses on Community based programming with their grants. The Mountain Institute’s work revolves around three central themes: economic development in the mountains, conservation of mountain environments, and support for mountain cultures. They are largely involved in educational programming on protected area conservation, and will provide smaller grants to programs that have this specific focus.
- **Mission:** Mountains sustain life on earth. In a world facing unparalleled economic and environmental upheaval, The Mountain Institute is committed to protecting our mountains. By conserving mountain ecosystems and empowering the people in mountain communities, The Mountain Institute ensures the preservation of resources—natural, cultural and spiritual—that are crucial to maintaining a healthy planet
<http://www.mountain.org/>

- Contact info: The Mountain Institute
- 3000 Connecticut Ave, NW, Ste. 101
- Washington, DC 20008 USA
- Phone: 202.234.4050



Bhutan Trust Fund for Environmental Conservation:

- The Bhutan Trust Fund for Environmental Conservation is an independent grant-making organization that uses its annual investment income to finance conservation activities. Grants are awarded to eligible Bhutanese individuals and institutions based on many criteria related to the potential project.
- <http://www.bhutantrustfund.bt/about-bhutan-trust-fund/what-we-do>
- *Information for grant seekers:* <http://www.bhutantrustfund.bt/guidelines-for-grant-seekers>
- Applications should be submitted by May 31st for fall consideration, or Dec 31st for spring consideration.

Royal Society for the Protection of Nature

- Royal Society for the Protection of Nature (RSPN) was established in 1987 and is the only non-profit organization in Bhutan exclusively concerned with the conservation of Bhutan's environment. Over the years, it has evolved as a complementary partner to the Royal Government in its endeavors to conserve Bhutan's rich natural resource base and also works with several international conservation organizations towards this goal.
- Currently working with local communities to demarcate critical habitat for white-bellied heron.
- **Mission:** to inspire personal responsibility and actively involve the people of Bhutan in the conservation of the country's environment through education, applied research and information dissemination, and collaboration with concerned agencies and indigenous institutions.
- <http://www.rspnbhutan.org>
 - Contact: RSPN
 - Deki Lam, Changangkha
 - E-mail: rspn@rspnbhutan.org; webmaster@rspnbhutan.org
 - PO Box 325; Thimphu, Bhutan
 - Tel: +975(2) 326130
 - Fax: +975(2) 323189



Global Environment Facility:

- Founded in 1991, The Global Environment Facility (GEF) was established to forge international cooperation and finance actions, to address four critical threats to the global environment: loss of biodiversity, climate change, degradation of international waters, and ozone depletion. Related work to stem the pervasive problem of land degradation is also eligible for GEF funding.
- Works with a focus on countries that have economies in transition. Has leveraged about \$11.5 billion dollars in grants since it's founding. GEF gives out grants ranging between \$10,000-\$100,000 depending on the scale of the project and the proposal.
- GEF Small Grants Program: <http://sgp.undp.org/>
 - Contact: Mr. Singay Dorji
 - National Coordinator
 - Phone: +975 2 321252/322424
 - Email: singay.dorji@undp.org
 - Ms. Tshering Zam
 - Program Assistant
 - Email: tshering.zam@undp.org

ICIMOD: International Centre for Integrated Mountain Development

- **Vision:** Men, women, and children of the Hindu Kush Himalayas enjoy improved wellbeing in a healthy mountain environment. **Mission:** To enable sustainable and resilient mountain development for improved and equitable livelihoods through knowledge and regional cooperation.
- Already have an office and many projects established in Bhutan. Including: Satellite Rainfall Estimation II, Transboundary Landscape Conservation, Regional Project on Shifting Cultivation, Medicinal Plants and NTFPS, Beekeeping, Livelihoods and Ecosystem Services in the Himalayas (AdaptHimal)
- Grants from this organization would need to be put towards research and development of conservation practices. In our opinion, this is an incredibly prominent factor in the future



success of the conservation efforts of the park, and we recommend that this grant process is pursued.

- Grants are given up to \$150,000
- <http://www.icimod.org/?q=1144>
 - Contact: Khumaltar, Lalitpur
 - G.P.O. Box 3226, Kathmandu, Nepal
 - Tel: (977) 1 5003222
 - Fax: (977) 1 5003299, 5003277
 - Email: info@icimod.org

Ugyen Wanghuck Insitute:

- Currently working on improving environmental tourism in Bhutan has created Village Tourism Management Groups to promote sustainable practices. This organization will not be a source of a grant, though it is worth keeping them on the periphery as a resource. Very beneficial as a partner in structural organization, and community relations.
- Part of the Bhutan Foundation
 - To support UWICE’s vision to become a center of excellence in conservation biology through exemplary applied research on Bhutan’s key wildlife species and the natural environment
 - To support conservation of Bhutan’s biodiversity
 - To support the creation of a platform for public discourse on major environmental issues in Bhutan
- PO Box 255
- Thimphu, Bhutan
- Tel: +975 02 335613
- Fax: +975 02 335614
- Tel: +1 202 640 1889



The International Elephant Foundation (IEF)

- An international workshop held in Malaysia in 2006 brought all 13-range country representatives together to conduct a threats assessment and identify limiting factors affecting population abundance in Asian elephants (Elephant Range States Meeting, 24-16 January 2006, Kuala Lumpur, Malaysia, IUCN/SSC). The 2006 workshop identified 5 overarching factors limiting population abundance for Asian elephants. For the 2013 grant cycle, the Foundation will only accept applications that target the 5 identified factors, these include: lack of adequate status and threats assessment; habitat fragmentation and loss; human-Asian elephant conflict; illegal killing and trade; and managing captive Asian elephants with the highest priority given to:
 - Managing captive Asian elephants;
 - Human-Asian elephant coexistence; and
 - Reducing habitat fragmentation and loss.
- Grant applications are being accepted for 2014:
<http://www.elephantconservation.org/programs/conservation-project-grant-application/>

Wildlife Conservation Society:

- Does not currently work within Bhutan. The society gives out three different types of grants, and we believe that the individual grant would be appropriate for this type of effort. The grants are small, between \$10,00 and \$50,000, but this would be a good chance to support personnel in the national park. The society has a strong focus on wildlife and land conservation, which are both brought up in our recommendations. Working with this organization would help build capital within the park, and work to implement different programs. The society is based out of the United States, so it would be an easy contact for the near future. This particular branch works with almost all of the other, major conservation grant holders, and would be a fantastic opportunity.



- **Mission:** Save wildlife and wild places across the globe. Already working in multiple countries with tiger conservation as well as climate adaptation
- <http://www.conservationleadershipprogramme.org/>
 - Contact: Wildlife Conservation Society
 - 2300 Southern Boulevard, Bronx, New York 10460
 - (718) 220-5100

MacArthur Foundation:

- **Mission:** MacArthur's conservation grant making aims to preserve ecosystems and species and to promote development that respects the environment.
- It is difficult to receive a grant from the MacArthur foundation, and they do not currently have projects in Bhutan. There is definite possibility that they would be willing to expand, however they are more focused on environmental management in regard to climate change as opposed to human-wildlife conflicts. In preparing a grant proposal, the focus should be on the aforementioned focus with a subsequent focus on its effects on the animals that live in the park.
- <http://www.macfound.org/tags/india/>
 - US Contact: John D. and Catherine T. MacArthur Foundation
 - Office of Grants Management
 - 140 S. Dearborn Street
 - Chicago, IL 60603-5285

Endangered Species International:

- Endangered Species International is strongly committed to reversing the trend of human-induced species extinction, saving endangered animals, and preserving wild places! They give out grants, but they require field visits before they will make any decisions. Their focus, as might be expected, is on endangered species; if there is an incentive for them to donate money to this particular area, they are incredibly inclined to do so. In order to receive the grant it will be vital to show them that there is a distinct benefit to the environment. There is no information on the particular sizes of their grants, but as a smaller organization it would likely be in smaller increments.



- <http://www.endangeredspeciesinternational.org/mission.html>
- Contact: info@endangeredspeciesinternational.org

Save the Tiger Fund and Panthera Partnership:

- **Mission:** Ensure the future of wild cats through scientific leadership and global conservation action. SFT-Panthera Partnership are two of the world's most influential tiger conservation groups with the goal of saving the world's remaining wild tigers. They have granted over \$17.3 Million over 10 years to the countries that house tigers in the wild. This would likely be a great organization to partner with because of their work with snow leopards. They do have a lot of pull into other areas though, and seem to be slightly shorter on funding. They do not currently work in Bhutan, however, they are in multiple other central Asian countries. Focus grant proposal on impending land degradation as well as the human-wildlife conflict issues.
- <http://www.panthera.org/programs/snow-leopard/snow-leopard-program>
 - Contact: Panthera 8 West 40th Street,
 - 18th Floor New York, NY 10018 USA
 - Tel: +1 (646) 786 0400 Fax: +1 (646) 786 0401

The Nature Conservancy:

- **Mission:** To conserve the lands and waters on which all life depends.
- Does not currently work within Bhutan. TNC is more likely to form a partnership than to give a large grant, though it looks like their current projects are incredibly beneficial. This organization is one that we suggest going to in a few years for more extensive conservation assistance. They work to increase international awareness of problems in other countries, which would be good for generating interest in independent donations. They have an extensive social media presence, which is a good start for raising awareness about the issues facing Jigme Dorji and Bhutan.
- <http://www.nature.org/ourinitiatives/regions/asiaandthepacific/index.htm>
 - Contact at: Worldwide Office The Nature Conservancy
 - 4245 North Fairfax Drive, Suite 100 Arlington, VA 22203-1606



Conservation International:

- Does not currently work within Bhutan, but they have a strong interest in the Himalayan mountain range conservation efforts. At the moment, they are not accepting proposals for grants, but this can be attributed to the recession. They have a fantastic focus on long-term programming and financial management, and because of this it would be important to begin building a relationship with their regional counterparts.
- **Mission:** Building upon a strong foundation of science, partnership and field demonstration, CI empowers societies to responsibly and sustainably care for nature, our global biodiversity, for the well-being of humanity.
- **www.conservation.org**
- **<http://www.conservation.org/global/gcf/grants/pages/default.aspx>**
 - Contact: Singapore - Asia-Pacific Regional Office
 - 318 Tanglin Road, #01-30
 - Block B, Singapore 247979, Singapore
 - +65 6733 2546
 - singapore@conservation.org

The Walt Disney Worldwide Conservation Fund:

- Recognizing that ecosystems are the basis of the planet's health, the Disney Worldwide Conservation Fund provides financial support for the study of wildlife, the protection of habitats and community conservation and education. The goal is to support conservation organizations focused on long-term positive impacts for wildlife and habitats. To date, the DWCF has awarded more than \$20 million to projects in 112 countries. The Annual Conservation Grants are by invitation only. They focus mostly on animals, and have a special tie to central Asia because of their park themes. This would be a good organization to be associated with, and partnerships could be worked out for international tourism if relationships are maintained.
- Grant Seeker Resources: Deadline for letters of inquiry for 2013 grants is February 1st; Deadline for completed applications is March 15th.
- **<http://thewaltdisneycompany.com/content/conservation-funding>**



World Bank:

- Currently working in Bhutan on various development and conservation projects. Has the potential to be a large grant source- \$4.5 Million for forest conservation and sustainable use efforts in Paraguay. This type of grant will require a high level of structural organization and integrity before it will be possible to apply. Support from government and large multinationals will likely be necessary.
- They have developed a small grants program in partnership with a large number of conservation and development foundations.
- <http://www.worldbank.org/en/country/bhutan/projects>
- <http://wbi.worldbank.org/wbdlm/partner/world-bank-small-grants-program>
 - Contact: Thimphu Bhutan Development Bank Limited Bldg.
 - Norzam Lam Chubachu Thimphu, Bhutan
 - +975-2-331775
 - mlaprairie@worldbank.org

FAO: technical cooperation Program in Bhutan

- Many programs in Bhutan are already funded by the FAO. One of the most relevant is the 'Land degradation assessment and monitoring for sustainable land management and climate change adaptation in South Asia'
- Have approximately \$500 Million available to give for funding. Partnership with one of the other programs that is being funded would increase chances of receiving funding. Most of the money in the FAO is given voluntarily by the governments of the country, so any type of grant will be dependent on whether or not the Bhutanese government has access to more funding to give out.
- <http://www.fao.org/countryprofiles/index/en/?iso3=BTN&subject=1>



IFAD: International Fund for Agricultural Development (an agency of the UN)

- **Mission:** Enabling poor rural people to improve their food security and nutrition, raise their incomes and strengthen their resilience
- Since 1981 IFAD has approved a total of US\$50.9 million for investments in seven programmes and projects in Bhutan. One programme is ongoing. IFAD has concentrated its operations in the eastern part of the country, which has a relatively dense population. It is also the area where food insecurity is highest. The programmes and projects are part of IFAD's long-term effort to support the government in empowering poor rural people to achieve greater food security and higher incomes, while ensuring environmental sustainability. Support focuses on the development of economic capital, especially rural infrastructure.
- The likelihood of receiving a grant from this organization is low, though not entirely impossible. They are more likely to offer consultation services, which have potential to be beneficial to the park and the overall success of program implementation. This is dependent on the amount of the consulting fee, and other corporate charges.
 - Contact: Nigel Brett
 - Country programme manager
 - Via Paolo di Dono, 44
 - Rome, Italy
 - Work: +39 0654592516
 - Fax: +39 0654593516
 - n.brett@ifad.org

Born Free

- **Mission:** End the suffering of wild animals in captivity, rescue individual animals in need, protected wildlife-- including highly endangered species-- in their natural habitats, and encourage compassionate conservation globally.
- Based in California, and have a focus in the United States. Would be highly interested in the tigers and snow leopard endangerment, but it will be difficult to work with them because of proximity. Grants are not large, \$7500, but can potentially go up to \$15,000.
- Currently working to conserve tigers through their Save the Wild Tigers program. Not in Bhutan.



- Contact: Born Free USA
- P.O. Box 22505 Sacramento,
- CA 95822 916-447-3085

United States Fish and Wildlife Service Conservation Fund

- Wildlife Without Borders- Rhinoceros and Tiger Conservation Fund working to restore rhino and tiger populations to healthy numbers in the wild. There are opportunities for international funding, but they are rare. Because of the park manager's current location in the United States, it is entirely possible that this connection would tilt the chances of receiving funding.
 - Contact: Email mscf_rhinotiger@fws.gov
- Asian Elephant Conservation Fund
 - Email: mscf_asianelephant@fws.gov
- How to apply: <http://www.fws.gov/international/grants-and-reporting/how-to-apply.html>



Annotated Bibliography

Brooks, N., Adger, W., & Kelly, M. (2005). The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation. *Global Environmental Change*, 15(2), 151-163.

- Statistical relationships between risk and outcomes are analyzed to create a standard for determining a country's risk and adaptive ability for climate change. Bhutan ranks in the moderately risk prone category as dictated by analysis of government structure, involvement, and response to climate change. This study has developed its own scale for evaluating the different areas needed to adapt to climate change.

Chhetri, B. B., K. Schmidt, and D. Gilmour. 2009. Community forestry in Bhutan-exploring opportunities and facing challenges. *Community Forestry International Workshop, Pokhara, Nepal, September 2009.*

- Community forestry in Bhutan has not been widely researched and this paper is one of the only papers existing that explores community forestry practices within Bhutan. The paper reviews the history of community forestry and recent developments, including the legal framework necessary for community forestry. It investigates the benefits, including social, environment and economic benefits. And addresses the challenges in the realm of political support, raising awareness, enabling framework, simplified application, income generation, sustainable management, governance, capacity development, monitoring system and poverty reduction. The paper concludes with how Bhutan can best manage for these challenges when implementing community forestry in the future.



Gruber, J. S. 2010. Key principles of community-based natural resource management: a synthesis and interpretation of identified effective approaches for managing the commons. *Environmental Management*. 45:52-66.

- This paper compiles a list of effective characteristics of community-based natural resource management. The author did an extensive literature review and compiled a matrix of organizational principles and recommendations. For example, “Provide for participation of stakeholders at all stages: information gathering, consultation, visioning and goal setting, initiating action, participating in projects, and evaluation” (56). This list may be helpful to our practitioner because it provides a framework for developing new CBNRM programs.

Heller, N. & E. S. Zavaleta. (2009). Biodiversity management in the face of climate change: a review of 22 years of recommendations. *Biological Conservation*. 142(1): 14-32.

- Compiles a list of recommendations from 22 years of literature on how protected areas should incorporate climate change impacts into their management plans. Some of the most cited recommendations were (1) increase connectivity by designing corridors, locating reserves close to each other and reforestation, (2) integrate climate change into planning exercises by setting grazing limits, incentive programs and harvest schedules, (3) mitigate other threats such as invasives, fragmentation and pollution, (4) study response of species to climate change physiological, behavioral and demographic, (5) practice intensive management to secure populations, (6) translocate species, (7) increase the number of reserves, (8) address scale problems match modeling, management and experimental spatial scales for improved predictive capacity, (9) improve inter-agency and regional coordination, (10) increase and maintain basic monitoring programs and (11) practice adaptive management.



Pandit, R. & E. Bevilacqua. 2011. Forest users and environmental impacts of community forestry in the hills of Nepal. *Forest Policy and Economics*. 13:345-352.

- This paper explores community forestry as a type of forest management in Nepal. It begins with an introduction of community forestry and why it became a vital tool for conservation within Nepal. Then the authors explain their methods of using interviews and a literature review to determine if community forestry has had positive environmental impacts on the Nepalese forests. The results conclude that community forestry has had successful ecological impacts but there are still multiple challenges associated with community forestry as a way to reduce poverty. Due to the similarities between Nepal and Bhutan, we believe that community forestry has the potential for environmental conservation in Bhutan as well.



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