REALIZING THE POTENTIAL OF PROTECTED AREAS AS NATURAL SOLUTIONS FOR CLIMATE CHANGE ADAPTATION: INSIGHTS FROM KENYA AND THE AMERICAS

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ABSTRACT

Protected areas play a fundamental role in national, regional, and global climate change adaptation strategies. They safeguard and enhance the resilience of ecosystems and protect clean water and other vital services that human communities rely on for their well-being. This paper highlights how protected areas agencies and their partners in four countries have begun working together to implement ecosystem-based approaches to climate change adaptation. By sharing experiences and knowledge, protected area agencies in Kenya, Mexico, Chile and Colombia have increased local and national capacity to contribute to climate adaptation strategies through research, monitoring, planning, active management and ecological restoration projects. By also identifying opportunities to engage communities and offer meaningful visitor and learning experiences as part of on-the-ground activities, the projects are inspiring citizens and building understanding of how protected areas help address global challenges like climate change.

KEYWORDS: climate change, Kenya, Mexico, Chile, Colombia, adaptation strategies, communities, visitors

INTRODUCTION

Families living near the Tsavo National Parks worry how the changing climate will harm food security and tourism. Downstream communities wonder what increasing droughts mean for their drinking water and livelihoods. Our efforts are strengthening the ecological values of our protected areas to help these communities cope with climate impacts, and are at the same time building support for our protected areas. [Edwin Wanyonj Kenya Wildlife Service]

This paper highlights how ecosystem-based management approaches undertaken by protected area agencies in four countries, in partnership with Parks Canada and in-country partners, are strengthening ecological and societal resilience to climate change. Drawing on examples from Kenya, Mexico, Chile and Colombia, it demonstrates how challenges associated with climate change are being addressed through projects in and around national parks and other protected areas in these countries. These projects are being implemented such that they also broaden public understanding of the role and contribution of protected areas to addressing global challenges and, in doing so, improving human well-being and inspiring people with hope for the future.

THE ROLE OF PROTECTED AREAS IN CLIMATE CHANGE ADAPTATION

Climate change is having marked impacts on the health of ecosystems and the ecosystem services they support. In many areas, it is already causing changes in

Community members participated in removal of invasive plant species in Aberdare, Amboseli, Tsavo East and Lake Nakuru National Parks in Kenya © Kenya Wildlife Service

precipitation patterns, water levels, and frequency and severity of droughts, floods, and fires (IPCC, 2007). In response to changing climatic conditions, species movement and distribution patterns are shifting, the timing of lifecycle events is changing, and pest and disease outbreaks are becoming more frequent, with concomitant effects on wildlife health (Starzomski, 2013). These climate impacts, compounded by habitat loss and fragmentation, pollution, spread of invasive species, and other stressors, are likely to exceed the resilience of some ecosystems to adapt naturally (Fischlin, 2007). Human communities, likewise, increasingly will be affected by changes in the availability of fresh water for drinking or agriculture, loss of crops to disease, and damage to property from storms and floods (IPCC, 2007).

Protected areas are critical for the conservation of biodiversity in periods of rapid environmental change and are predicted to continue to play this role into the future (Johnston et al., 2013). Protected areas provide habitat for native species and opportunities for autonomous adaptation, migration and natural selection processes (e.g., through maintenance of genetic diversity) (Hannah et al., 2007; Hannah, 2009; Environment Canada, 2009; SCBD, 2009). This in turn enhances the resilience of ecological systems and their capacity to respond to climate change impacts such as changing disturbance regimes (Dudley et al., 2010; NAWPA, 2012; CPC, 2013).

Protected areas are also key components of ecosystem-based adaptation (SCBD, 2009; Colls et al., 2009), playing a fundamental role in assisting human adaptation (e.g., SCBD, 2009; Staudinger et al., 2012; Hounsell, 2012; Munang et al., 2013 MacKinnon et al., 2012; NAWPA 2012; Dudley et al., 2010; World Bank, 2009; Mooney et al., 2009). It has long been recognized that healthy ecosystems provide a multitude of ecosystem services that support, for example, food security, clean air and water, and climate regulation (MEA, 2005). They also act as buffers and reduce vulnerability to extreme events. Through their role in maintaining ecosystems and the services they provide, protected areas offer a 'natural solution' for climate change adaptation (e.g., Dudley et al., 2010; NAWPA, 2012; CPC, 2013).

Increased attention to the climate change adaptation benefits of protected areas is occurring at the same time that we are seeing a shift in the role of protected areas in general (Ervin et al., 2010). Whereas historically they were seen as places that were set aside to protect key natural and cultural values, more and more they are expected to provide a diverse range of benefits for biodiversity and for people. As efforts are made to maintain this range of benefits, management intervention is becoming more common (Ervin et al.,

2010; Keenleyside et al., 2012). This is both an opportunity and a challenge for protected area agencies and managers who need to be able to make decisions about how to intervene effectively in an era of rapid change.

Protected areas can also contribute to climate change mitigation through their role in storing and sequestering carbon in healthy ecosystems (e.g., Sharma et al., 2013). We recognize that many of the adaptation actions discussed in this paper (e.g., reforestation efforts in Chile and Kenya, and forest fuel management in Mexico) also have mitigation co-benefits; however, our focus here is on the role of protected areas and their effective management in helping ecosystems and people adapt to change. We focus on projects in Kenya, Colombia, Chile, and Mexico– where protected areas agencies, managers, strategic partners and local stakeholders are taking steps to not only manage the ecological effects of climate change on protected areas and the benefits they provide, but also to do so in a way that engages local communities, users, visitors, and the wider public.

RISING TO THE CHALLENGE: EXAMPLES FROM KENYA AND THE AMERICAS

Protected areas have great potential as natural solutions for climate change adaptation. However, the scope and scale of climate change demands that action be taken in order for that potential to be realized fully. Several frameworks (e.g., MacKinnon et al., 2012; CPC, 2013; NAWPA, 2012) call for protected area agencies around the world to rise to this challenge, by collaborating, regionally, nationally and internationally to:

1. Expand protected areas coverage through enlargement, establishment of new areas, and improved connectivity;
2. Integrate protected areas into wider sectoral development strategies;
3. Improve our understanding of climate change impacts, vulnerabilities, and solutions for parks and protected areas;
4. Improve management and governance of existing protected areas, including actively managing and restoring the ecological integrity of ecosystems;
5. Share knowledge to help grow capacity and ensure effective management of parks and protected areas nationally, regionally, and globally; and
6. Engage and inspire people with hope for the future.

(This 'framework' was modified from MacKinnon et al., 2012 and Canadian Parks Council, 2013)

Thanks in part to a partnership opportunity with Parks Canada provided by the Government of Canada's 'Fast Start Financing' programme, protected area agencies in Kenya, Colombia, Chile, and Mexico are taking actions to meet this challenge. Beginning in mid-2012, and early 2013, protected areas agencies in these countries developed and began implementing climate change adaptation projects that illustrate the role that national parks and other protected areas can play in helping vulnerable communities around the world adapt to climate change. These projects are now at various stages of completion and while their ultimate outcomes have yet to be achieved, work to date provides insights from which other protected area agencies and organizations may benefit.

The adaptation approach adopted in each country was *modelled* on the framework described above, with an emphasis on elements *three through six*. This approach recognizes the importance of achieving conservation success through actions that maintain or restore the natural and cultural values of protected areas while simultaneously facilitating meaningful visitor experience and learning opportunities (e.g., Parks Canada, 2013).

A contextual overview for each of these projects is shared below, followed by highlights of their contributions to realizing the potential of protected areas as natural solutions for climate change adaptation.

COUNTRIES AND PROJECT CONTEXT

Kenya: Higher temperatures and more variable precipitation, along with other climate change effects such as increasing incidences of fire, pests and disease, and human-wildlife conflict, are having adverse affects on the health of wildlife and human communities in Kenya (NEMA, 2013; Herrero, 2010). Rural Kenyans, who rely largely on rain-fed agriculture for their livelihoods and food security, are particularly vulnerable to variations in precipitation that result in more frequent and prolonged droughts, flooding and diminishing water resources (Herrero, 2010). Unsustainable land uses, such as overgrazing, and the spread of invasive species, compounded by climate changes, are degrading ecosystems and the ecosystem services they support (NEMA, 2013).

The Kenya Wildlife Service (KWS), in partnership with the Water Resource Management Authority, and Forest Research Institute, has focused on restoring wetlands, mountain forests and savannah bush ecosystems in six national parks (Amboseli National Park, Tsavo East and Tsavo West National Parks, Mt. Kenya and Aberdare National Parks, and Lake Nakuru National Park). Ecological restoration of these degraded park ecosystems

Páramo ecosystems in Chingaza National Park, Colombia © Parks Canada

is enhancing ecological integrity with benefits for biodiversity, water supply, food security and local livelihoods. Many of these parks are in regions particularly important for water security, with the Mount Kenya and Aberdare forests protecting the headwaters of rivers that supply water for about half of the country's population.

Chile: Glacial melt, shifts in rainfall patterns, expanding deserts, and fluctuations in El Niño impact Chile's water supply, food production, tourism industry and migration, and thereby the country's economy and national security (Ministry of the Environment, 2011). Chile's national territory, which includes the world's driest desert, the high altiplanic plateau, a very long Pacific coast, temperate rainforest and southern Patagonia land, has very high species endemism. The public protected areas system is one of the most important conservation mechanisms in the country. Protected areas are enshrined in the Climate Change Sector Plan, which is part of the National Action Plan for Climate Change, in recognition of the role they play in helping the country adapt to climate change impacts. Chile's Ministry of the Environment (MME), working in close cooperation with the National Forest Corporation (CONAF), has been conducting research and monitoring and planning on-the-ground restoration activities in three public protected areas: the Patagonian ecosystems of the Torres del Paine National Park, high Andean wetlands of Nevado Tres Cruces National Park and the coastal wetlands of El Yali National Reserve. As is described more fully below, these activities are helping to maintain biodiversity in the face of change and are also having important economic and educational benefits.

Colombia: In Colombia, which is one of the world's 'megadiverse' countries, especially for bird species, many natural ecosystems have been degraded, primarily in the Andean and Caribbean regions, as climate change converges with deforestation and other stressors (SCBD, 2014). The National Natural Parks System of Colombia (PNNC), in partnership with *Patrimonio Natural – Fondo para la Biodiversidad y Areas Protegidas*, has been leading multiple initiatives related to protected areas and climate change, including development of a climate change strategy for the PNNC. Work has focused on assessing and reducing the vulnerability of protected areas ecosystems to climate change by integrating climate change considerations into updated management plans for more than 25 protected areas. Detailed plans

are currently being developed for implementation of specific management actions that address identified vulnerabilities in several parks and in some cases action is already being taken.

Mexico: Increases in the frequency and intensity of extreme weather events (e.g., hurricanes and floods) are already having significant impacts in Mexico; particularly in the Caribbean Sea, the Gulf of Mexico and the Mexican portion of the Pacific Ocean. In central and northern regions, the frequency of extreme drought events has increased over the past decade, with water supply expected to decrease by up to 20 per cent over the next 50 years. In 2010, Mexico's National Commission for Protected Areas (CONANP) through its Climate Change Strategy for Protected Areas (CONANP, 2010) has implemented specific mitigation and adaptation goals and actions as part of the country's overall climate change policy. In this project, CONANP, in partnership with Fondo Mexicano para la Conservación de la Naturaleza A.C. (FMCN) is replicating and building on climate adaptation programmes that have been completed in other regions of the country, in alignment with Mexico´s National Climate Change Strategy. In the Northeast and Eastern Sierra Madre region, one of the driest and most vulnerable areas of the country (ENCC, 2013; Government of Canada, 2013), CONANP and FMCN have undertaken four vulnerability assessments with a landscape approach of ecosystems and human communities considering their productive activities to determine concrete and robust adaptation measures. For each adaptation measure one 'on the ground conservation or management project' was defined in addition to the on the ground restoration work undertaken in the five protected areas of the project.

REALIZING THE POTENTIAL

In various ways, these four countries are applying the above framework for realizing the potential of protected areas as natural solutions for climate change adaptation. As is described below these projects are improving our understanding of, and capacities to respond to, climate change impacts and vulnerabilities. That new knowledge is being integrated into protected area management strategies, policies, and plans and, in some cases, action is already being taken to improve protected area management through active management and restoration projects that are aimed at strengthening ecological, institutional, and societal resilience to change. These on-the-ground restoration activities in turn are offering opportunities to engage and inspire people by connecting them to nature and their own communities and giving them the chance to create positive change. As results of these projects unfold, monitoring of climate change impacts and project outcomes will help to inform protected area managers so that project activities can be adjusted appropriately.

Improving understanding: Improving understanding of the likely impacts of climate change, how ecosystems are likely to respond, and the effects of various management approaches, is fundamental to enhancing individual and institutional capacities to adapt to climate change (e.g. Glick et al., 2009; Watson et al., 2012; MacKinnon et al., 2012). In Chile, the MME, in collaboration with CONAF and university researchers, has been increasing baseline knowledge about the hydrological and ecological functions of the wetland complexes of the Nevado Tres Cruces National Park and the El Yali National Reserve (both RAMSAR sites). This knowledge will be fundamental for projecting how these wetlands systems are likely to be affected by climate change and other stressors. As the MME, CONAF, researchers, community members, and other stakeholders collectively understand more about these systems, they are also better equipped to make realistic, practical management decisions and take actions that will enhance the resilience of the wetlands to maintain bird and wildlife populations and water supply, and support the aesthetic and recreational values of the sites.

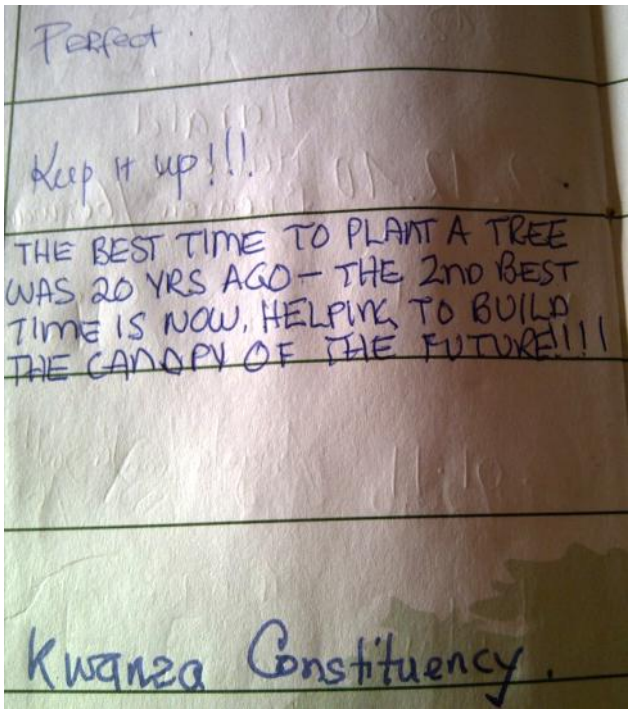
Similarly, in Mexico and Colombia, a solid knowledge base is fundamental to informing climate change vulnerability assessments and park management planning. Outreach activities have helped communities living in and around protected areas to understand the benefits they provide, and how climate change, as well as their own actions (e.g., agricultural practices) can affect the ecosystem services they rely on. Park managers in all countries are also identifying opportunities, for example through citizen science and communication programmes, to engage with the public and visitors in ways that also build knowledge and capacity of institutions and local communities to adapt to climate change.

Improving management through ecological restoration that engages and inspires: In an era of rapid environmental change, ecological restoration is increasingly required to maintain and strengthen resilience of ecosystems (Keenleyside et al., 2012, Hobbs et al., 2010). Overall, ecosystems with high integrity and complexity are more likely to maintain ecological function in face of rapid change (Lemieux et al., 2010; Hooper et al., 2005). Ecological restoration strengthens resilience to climate change by reducing non-climatic stressors and recovering ecosystem processes and functions, as well as by engaging communities in a meaningful way to build their capacity to adapt to

changes (Keenleyside et al., 2012; Heller and Zavaleta, 2009). Best practice principles call for restoration to be *effective*, *efficient* and *engaging* (see Keenleyside et al., 2012; Parks Canada & CPC, 2008).

On-the-ground restoration is an important focus of the projects, particularly in Kenya where park managers undertook a wide range of activities, such as modernizing tree nurseries, planting seedlings removing invasive species, and protecting riparian zones (see Box). In Colombia, Chile and Mexico, ecological restoration activities have also been initiated to reduce the vulnerability of ecosystems and human populations to climate change. For example, in Colombia's Chingaza National Park, park managers are restoring the páramo ecosystem that has been degraded by cattle grazing and other uses. A non-permanent nursery is being constructed to produce material for re-planting native species. The restoration of this site will help maintain the source of drinking water supply for eight million Colombians, including the residents of Bogotá (Buytaert, 2007; Crespo, 2010).

In Chile, accidental fires burned approximately 20,000 ha of Torres del Paine National Park (one of the most visited parks in South America and a UNESCO Biosphere Reserve) during December 2011 and January 2012. A detailed ecological restoration plan has been developed for the park which, when implemented, will help to ensure that the ecological and tourism benefits of the park are maintained despite this potentially-devastating loss. This plan not only addresses recovery from the single fire event, but also a broader strategy to understand and reduce wild-fire risk and increase resilience of the forest ecosystem. The project already has enhanced capacity for ecological restoration efforts in the park. Project partners have expanded and modernized tree nurseries in nearby Puerto Natales, established protocols for growing and planting seedlings, and increased production from approximately 49,000 to approximately 150,000 seedlings per year.



Page from the guest book at Treetops Lodge, Aberdare National Park, Kenya © Parks Canada

Engaging restoration: Ecological restoration that is engaging recognizes and embraces the interrelationships between culture and nature. It encourages people to connect with nature in ways that deepen their sense of attachment to protected areas, and gives them opportunities to discover nature and experience its many benefits, including strengthening their own spiritual balance and well-being. Engaging indigenous/aboriginal and local communities also helps maintain or revive cultural practices as part of the ecological restoration. There is growing scientific evidence that human engagement with and connection to nature has a positive effect on human health and physical and mental well being (e.g., Maller 2005; White et al. 2013; Kuo 2011). In addition, fostering opportunities to connect people with nature and engage visitors and communities in park activities builds support for stewardship of protected areas and their role in climate adaptation (CPC, 2013).

RESTORING MZIMA SPRINGS TO INCREASE WATER SECURITY

Activities to restore the riparian areas of a major water source in Tsavo West National Park in Kenya illustrate how restoration can reduce the influence of non-climatic stressors, protect ecosystem services and help wildlife and human communities adapt to climate impacts, such as drought (see Stolton & Dudley, forthcoming). The Mzima Springs supply 360 million litres of water daily to about 2.5 million people downstream, including residents of the city of Mombasa. Over-grazing by wildlife, particularly by elephants, around the springs was leading to severe habitat degradation, soil erosion and siltation. The installation of a solar-powered electric fence to exclude wildlife is allowing the riparian vegetation to regenerate. In addition, watering sites constructed as alternatives for wildlife about one kilometre away from the springs and away from human populations are helping to reduce human-wildlife conflicts outside the park. Signage installed to explain the restoration project is informing park visitors and the local community about the benefits of healthy wildlife populations to the long-term success of tourism and economy, and of protection of the water supply source for local and downstream communities.

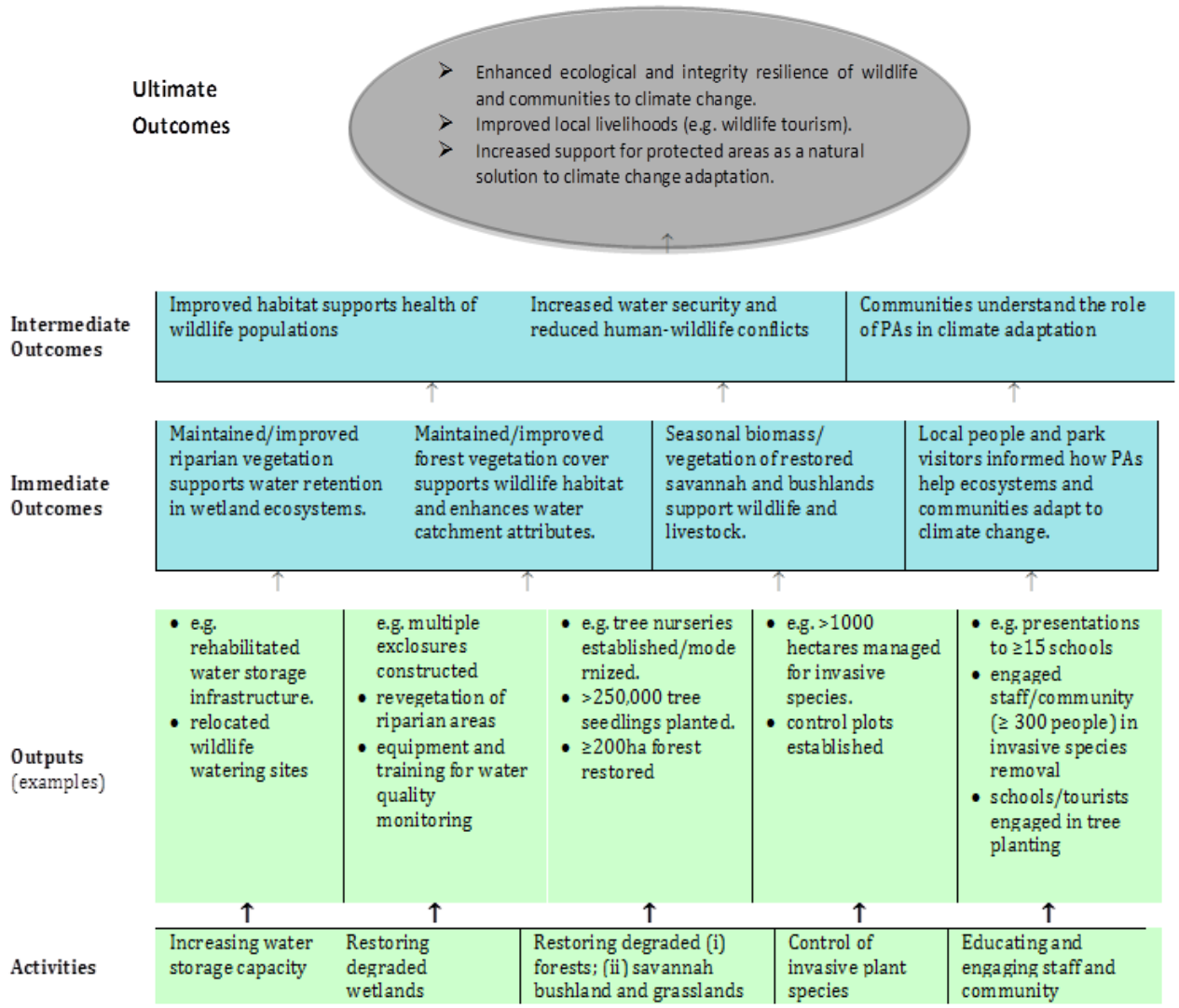


Figure 1: Illustrative linkages between project activities and the short term and long term outcomes of climate adaptation project in Kenya (adapted from Project Logic Model)

In Kenya, Chile, Mexico and Colombia, restoration activities have incorporated opportunities to engage and inform land owners, locals, visitors, and the public about the value of restoring protected areas and how this contributes to climate adaptation. For instance, media coverage of forest restoration in Chile's Torres del Paine NP, where tourism supports many local businesses and families, has heightened public awareness of how healthy park ecosystems contribute to healthy local economies. In addition, youth volunteers are participating in the Torres del Paine restoration project through the engagement of a local ENGO.

In Mexico, adaptation measures of priority conservation targets within the landscape were identified through a participatory vulnerability analysis that incorporated the knowledge and expertise of local communities and key stakeholders, and a public awareness component was added to the on-the-ground restoration activities to inform Mexican and international visitors about the roles protected areas can play in response to climate change.

In Kenya, not only were interpretive signs displayed to inform the public about restoration activities, but in several cases the restoration efforts were identified as visitor attractions, and proposals such as extending game viewing tracks to rehabilitated wildlife watering sites were made. Hundreds of volunteers and school groups participated in invasive species removal and tree planting in different parks, learning from and being inspired by hands-on experience. Visitors to Aberdare National Park were invited to plant trees, and share their reflections in a guest book at Treetops Lodge. The messages left are a testament to the power of engagement, as entry after entry proclaims the deep pleasure experienced by visitors when they contributed to a green future for the country by planting trees as part of restoration efforts in the park.

Figure 1, which is adapted from a project logic model, illustrates how specific activities, outputs, and outcomes are linked with the achievement of the ultimate outcome of enhanced ecological and societal resilience to climate

Fifteen rural communities have been trained in climate change adaptation and mitigation in the Northeast and Eastern Sierra Madre Region, Mexico © Comisión Nacional de Áreas Naturales Protegidas

change. Similar logic models were developed and used to guide project planning and implementation in all four countries.

Sharing knowledge and growing capacity: By collaborating on these projects, our institutional capacities to adapt to climate change have grown, as we have developed and implemented monitoring, research, assessment, planning and active management and restoration programmes that help us better understand and respond to change. In Chile, knowledge gained through research and monitoring of wetland complexes has enhanced the capacity of the Ministry of the Environment and CONAF to manage for change. Similarly, in Colombia, the integration of information on climate change into park management plans, has positioned the PNNC to implement appropriate adaptive management strategies.

Through our work with our partners and communities local capacity is growing too. In Aberdare and Mt Kenya National Parks, for example, 180 community forest association members were trained in modern seedling production to assist with re-forestation of degraded areas inside and outside protected areas. In Mexico, communities in and around Cumbres de Monterrey National Park and other protected areas in the Northeast and Eastern Sierra Madre region have learned about how climate change is likely to affect agriculture and in turn how they may need to adapt their farming practices to cope with these changes. The participatory approach implemented by CONANP and FMCN has also facilitated the exchange of knowledge and lessons learned with other key stakeholders and state governments.

Through collaboration, we also have learned from each other. We have learned that, while climate change and other global changes put immense pressures on protected areas, we can take steps to reduce the impacts of those pressures. We can be part of the solution. In fact, effective management of protected areas is a cost-effective and essential part of the solution. With a solid base of information, drawn from science and other forms of knowledge, we can plan appropriate management interventions that strengthen the resilience of our protected areas and human communities to change. We can implement those actions in a way that engages our visitors, our communities, and other sectors of society. Through participatory engagement, we can build support for project objectives at the outset and help to ensure the sustainability of their results into the future. Perhaps most importantly, we have learned that we can inspire

our communities and other stakeholders with hope for the future as they experience how their protected areas can help them deal with one of the world's most daunting challenges.

Engaging and inspiring people with hope for the future: Fundamentally, delivering on the potential of protected areas as natural solutions for climate change is about increasing the relevance of protected areas to people. By engaging people in activities to enhance resilience of our protected areas and the communities that depend on them, we can connect with their hearts and minds around a complex issue. We know that these emotional and intellectual connections with nature, and with protected areas, are essential for ensuring that people value their protected areas over the long term and take steps to conserve them into the future. Our creativity and innovation can foster and rekindle a passion for nature and allow the emergence of communities, locally to globally, that know that by strengthening the values of our protected areas we also support the well being of current and future generations. Our efforts are protecting 'a future of hope' and the opportunity for the next generations to experience these special places (Latourelle, 2010). In rising to one of the greatest global challenges, we are finding one of our most hopeful solutions.

CONCLUSION

Our four countries have had a special opportunity to work together and learn from each other. Together, we have improved our understanding of challenges and opportunities associated with climate change adaptation, and have developed and implemented active management and restoration projects accordingly. We have built our capacities to manage our protected areas, and by sharing our knowledge and experiences, we are improving capacity locally, regionally, and globally, for protected areas agencies to address climate change impacts. We have worked together in a way that has inspired us about the role that we can play, as protected area managers, in addressing global challenges like climate change; and we have worked with our protected area communities and other stakeholders in a way that has inspired our citizens about these treasured places.

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RESUMEN

Las áreas protegidas desempeñan un papel fundamental en las estrategias nacionales, regionales y mundiales de adaptación al cambio climático. Aseguran la conservación y resiliencia de los ecosistemas y protegen el agua y otros recursos y servicios que son vitales para el bienestar de las comunidades humanas. En este articulo se destaca la manera en que los responsables de las áreas protegidas y sus socios, en cuatro países, están trabajando conjuntamente para implementar enfoques ecosistémicos, con el objetivo de favorecer la adaptación al cambio climático. Mediante el intercambio de experiencias y conocimientos, las entidades encargadas de áreas protegidas en Kenia, México, Chile y Colombia han ampliado sus capacidades a escala local y nacional en torno al desarrollo de estrategias de adaptación al cambio climático. Estas incluyen el reforzamiento de actividades de investigación, supervisión, planificación y gestión activa así como la implementación de proyectos de restauración ecológica. Paralelamente también se ha identificado vías para reforzar y ampliar la participación comunitaria, ofreciendo a los visitantes atractivas y nuevas experiencias de aprendizaje como parte de las actividades realizadas en el terreno. Estos proyectos se han convertido en una fuente de inspiración para la ciudadanía y han facilitado la comunicación sobre como las áreas protegidas contribuyen a responder a los desafíos mundiales, tales como el cambio climático.

RÉSUMÉ

Les aires protégées jouent un rôle fondamental dans les stratégies d'adaptation au changement climatique au niveau national, régional et mondial. Elles permettent la préservation des écosystèmes, assurent leur résilience et protègent l'eau potable et les autres services essentiels dont dépendent les collectivités humaines pour leur bien être. Cet article met en lumière la façon dont les agences responsables des aires protégées et leurs partenaires, dans quatre pays, ont commencé à collaborer à la mise en place d'approches écosystémiques pour favoriser l'adaptation au changement climatique. En mettant en commun leurs expériences et leur savoir, les agences nationales responsables des aires protégées du Kenya, du Mexique, du Chili, et de la Colombie ont renforcé leur capacité locale et nationale de contribuer aux stratégies d'adaptation au changement climatique par la réalisation de projets de recherche, de surveillance, de planification, de gestion active et de restauration écologique. En mobilisant les collectivités et en offrant des expériences d'apprentissage significatives aux visiteursdans le cadre d'activités sur le terrain, les projets contribuent à inspirer les citoyens et les aident à comprendre le rôle que peuvent jouer les aires protégées face aux enjeux planétaires comme le changement climatique.