

# Thematic Paper #3

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- Smart Green Infrastructure
- Conservation through Community Incentives
- **Capacity-Building**
- Landscape-Scale Management
- Addressing Competing Demands
- Innovative Finance
- Costing Tiger Conservation



## **Managerial Capacity Building to Support the Conservation of Wild Tigers Foundation Paper for the Kathmandu Global Tiger Workshop 2009**

John Seidensticker<sup>1</sup>, Susan Lumpkin, Charles Lydeard<sup>1</sup>, Mahendra Shrestha<sup>2</sup>, Jennifer Sevin<sup>1</sup>, Francisco Dallmeier<sup>1</sup>, Eric Dinerstein<sup>3</sup>, Eric Wikramanayake<sup>3</sup>, Steven Monfort<sup>1</sup>, Andrew Zakharenka<sup>4</sup>, Adriana Bianchi<sup>4</sup>, and Keshav Varma<sup>4</sup>

<sup>1</sup>Smithsonian Institution, <sup>2</sup>Save The Tiger Fund, <sup>3</sup>World Wildlife Fund, <sup>4</sup>The World Bank

### **Executive Summary**

This background paper is one of seven developed for the Kathmandu Global Tiger Workshop 2009. The others are 1) Creating Local Constituencies for Tiger Conservation through Community Incentives and Alternative Livelihoods; 2) Smart Green Infrastructure in Tiger Conservation Landscapes: A Multilevel Approach; 3) Innovative Sustainable Financing for Tiger Conservation; 4) Suppressing Demand for Wild Tiger Parts and Enhancing Demand for Live Wild Tigers; 5) Detecting and Preventing Poaching and Illegal Trade in Tigers; 6) Landscape-Scale, Ecology-Based Management of Wild Tiger Populations; and 7) Conservation Resource Needs. This paper should be read in the context of these others as we did not repeat their reviews or recommendations.

There is universal agreement that something called “capacity development” or “capacity building” is essential to the successful conservation of wild tigers in the tiger range countries. All of the Tiger Action Plans currently in place point to this need for better trained people to get the job done, although what sorts of training or capacity building are necessary, or have the highest priorities, vary. But, overall, there is recognition that the human resources for conservation are lacking in one way or another, or in most ways, despite many well-intentioned capacity building programs.

This is what we mean by “business as usual:” Recognizing the problem in one report after another, conducting various training programs, and moving along to the next project. This does not mean that there are not success stories in tiger conservation or many devoted, highly-qualified conservationists and conservation practitioners struggling to save tigers. Rather, it means despite all of our best efforts, tigers continue to slide toward extinction. The solutions proposed and the programs conducted are small compared to the enormously challenging issues that must be addressed if we are to save tigers.

It is now too late to think small. A significant part of our task in the Kathmandu Workshop is to think big, to come up with game-changing, comprehensive solutions to the problem of saving tigers. In summary, the strategic approach to creating and supporting excellence in tiger protected area management boils down to attracting the best talent, transcending business-as-

usual governance with a strong leadership team that has a strategic vision of what it takes to save tigers and a culture of excellence in execution of core competencies, which is abundantly resourced.

This paper does not attempt to outline such a game-changing approach to developing the capacity for tiger conservation. That is the task of the workshop participants, each of whom brings a wealth of knowledge and experience to the table. This paper does attempt to provide a foundation for informed discussion of what game-changing capacity development will look like in each of the TRCs and how the GTI can best facilitate it.

Our challenge is to “stop the bleeding.” The fewer than 4,000 remaining wild tigers are being killed and lost as their habitat contracts, fragments, and degrades. In this paper we ask, what will save wild tigers? We conclude that stabilizing and recovering wild tiger populations is first and foremost a management challenge. Critical to “saving wild tigers” is rapidly increasing the management capacity of the on-the-ground managers who practice tiger conservation in the tiger range countries. The core tiger breeding areas are the priority; they must be effectively protected and managed. Nearly all of these are in protected areas. There are 342 protected areas that contain of 23% of the land area found within all of the Tiger Conservation Landscapes<sup>1</sup>.

Let us stress, however, that setting protected areas as the priority does not in any way diminish the importance of creating and maintaining corridors between them. But if protected areas are neglected and their core tiger breeding populations are lost, the corridors will be empty. Moreover, we suggest that protected area leaders, linked in a community of practice and working cooperatively, can be the most effective anchors for managing corridors and working with local communities to promote local stewardship.

We don't have baseline studies of the effectiveness of protected area management across the tiger's range from which to establish a gold standard for protected area management in support of tigers. But we learn from a recent global study of management effectiveness in protected areas that, overall, 65% of the assessed protected areas had “management with significant deficiencies”.<sup>2</sup> The critical findings of this global study that can inform the development of protected area managerial capacity is that good management outcomes were most strongly correlated with strong research and monitoring and resource protection coupled with good communications, involvement of local communities, and programs of community benefit.

Based on these findings and others, we believe there are at least two initial “points of entry” for building capacity for tiger conservation: 1) the individuals who lead and manage protected areas (at the level of director general, or equivalent, and their lieutenants, the reserve heads) and 2) the policy makers (ministers, secretaries). We define effective capacity building and the core competencies needed for successful protected area management. We follow with an outline of one Global Tiger Initiative (GTI) strategic response to capacity building needs, introduce a case

study on protected area management improvement, and close with suggested indicators of successful tiger management and recovery of wild populations.

## The Challenge

The Global Tiger Initiative (GTI) was launched in 2008 in the wake of a comprehensive report, *Setting Priorities for Conservation and Recovery of Wild Tigers: 2005-2015*.<sup>3</sup> Released in 2006, the report, which was based on the best available science, revealed the truly dire state of tigers across their range in Asia. Subsequently, the Government of India released its all-India tiger estimation and reported that the total number of tigers in India was down to about 1,400.<sup>4</sup> Despite conservation efforts that began in the 1970s, the tiger continued to lose ground so that by 2006, tigers lived in only 7 percent of their former range and habitat for tigers had decreased by 40 percent in just the previous 10 years. News from India, where tigers have been extirpated even from reserves dedicated to their protection, reinforced the fundamental message of the 2006 study: If we continue to practice tiger conservation as we have in the past, that is, continue with “business as usual,” tigers will soon go extinct in the wild. Part of that business as usual includes previous efforts at capacity building for tiger conservation management. Despite some successes at various levels, these clearly have not had sufficient impact to change the tiger’s downward spiral toward extinction.

The *Setting Priorities* report and the subsequent review by the World Bank and the Smithsonian Institution, *A Future for Wild Tigers*<sup>5</sup>, recommended a variety of improved or new conservation interventions to stabilize and restore tiger populations including:

- Creating and implementing conservation paradigms that enlist incentives, including the use of standardized, scientific means to monitor tiger and prey population distribution, numbers, and habitat integrity, and devise meaningful indicators of tiger conservation actions to allow for adaptive management approaches;
- Tackling illegal trade to control poaching;
- Developing strategies to address the root cause of the problem – the demand for tiger products;
- Employing smart green infrastructure development in tiger conservation landscapes;
- Increasing funding.

In most tiger range states, funding for the protection and management of national parks and other protected areas is a small fraction of that allocated in the United States, for example.<sup>6</sup> But funding alone does not account for disparities in management effectiveness. Development agencies, such as the World Bank and UNDP, and conservation organizations, such as Save The Tiger Fund, WWF and WCS, have learned through years of experience that *the capacity to use funding effectively is as or more important than the amount of funding*. Simply put in our present context, money will not save tigers, people will. Similarly, it is increasingly evident that good science is essential for effective biological conservation but not sufficient. In summing up the

experience of identifying and establishing competence standards for protected area staff, John MacKinnon noted: "...it became clear that more skills are needed in communication areas than in biological knowledge."<sup>7</sup>

All of this leads us to conclude that it is important to point out that this simple formulation – save the tiger – while effective as a call-to-action slogan, obscures the reality of the task. Tigers will not be “saved” once and for all. Since the tiger was first recognized as an endangered species four decades ago, tigers have been a *conservation-reliant species*, one that depends, and will forever depend, on human conservation interventions for survival, especially as the human population keeps growing and expanding horizontally across and into the Earth’s few remaining natural areas. The management skills needed to support these interventions continually change as the context for tiger conservation changes; for example, as the number of people continue to multiply and economies rapidly expand in the tiger range states so must the conservation responses. Developing and maintaining the individual, organizational, and social capacity to effectively conduct needed managerial interventions are and must be a major focus of the Global Tiger Initiative.

### **What Will Save Wild Tigers?**

The immediate challenges of maintaining wild tigers, even at the local level of protected areas, are daunting. The threats to tigers are pervasive and recurrent. All tiger habitat is embedded in human-dominated landscapes and, conversely, human habitat—villages, farms, roads, mines, plantations, factories—abuts and envelops areas set aside for tigers.<sup>8</sup> Tiger populations nest within human-dominated landscapes of extreme poverty and many landless people. Tiger conservation faces the added challenge of addressing land tenure issues, local rights, and the legitimate economic aspirations of the rural poor. As a result, conservation management must address very fundamental questions: How can tigers live next to people? How can people live next to tigers? And what management capacity is required to make this possible?

How can tigers live next to people? The good news is that years of experience tell us we can stabilize and recover tigers if we:

- Stop killing tigers. We will probably never be able to stop all poaching but poaching must be reduced at least to a level at which it does not threaten the viability of the population and thus tigers’ long-term survival. This requires greatly enhanced law enforcement at the local protected area level, and at national borders, with regional and international cooperation. The currently huge illegal trade is driven by an increasing demand for tiger parts and products. Any success in reducing the killing will necessarily address the demand side of the supply chain.<sup>9</sup>

- Effectively create (in some TRCs) and maintain (in all TRCs) core tiger breeding areas free from human disturbance, and that meet the tiger's essential ecological needs, including space, cover (forest and grassland), and food (prey such as deer and pigs).
- Connect core areas through forest corridors. The few remaining tiger populations survive mostly in fragmented forest landscapes.<sup>10</sup> Insular reserves, the stronghold of tiger conservation efforts to date, are rarely large enough to ensure the conservation of ecologically, demographically, and genetically secure tiger populations that are resilient to disturbance events.<sup>11 12 13</sup> Tigers must be able to disperse among reserves. Protecting reserves and forming natural corridors has the additional benefit of protecting natural ecosystems that provide humans with the ecological services (e.g., water purification and regulation, regional climate regulation) they need to survive and thrive. Managing landscapes to protect tigers also protects biodiversity and important ecological and evolutionary processes.
- Maintenance of prey. Even where good tiger habitat remains, prey has been depleted or lost. Prey must be restored and managed in cores and across tiger conservation landscapes.<sup>14</sup>
- Reduce anthropogenic impacts on core areas and corridors, for example by implementing smart green infrastructure development<sup>15</sup> and working with local communities to establish community forests that enhance and support corridor linkages and buffer zones. In short, we have to mainstream tiger conservation into the rural development agenda.

How can people live near tigers?<sup>16</sup> There is also experience to guide what must be done to enable people to live next to tigers:

- People who live near tigers will ultimately determine their fate. They must see the species as a living asset if they are to allow its continual coexistence. But the cost of living in close proximity to tigers means that they will need economic and quality of life incentives. On a national scale, tigers and the environmental services their habitats provide must be properly valued.
- Harmonize human needs for infrastructure and other development with what tigers need to survive, such as by implementing smart green infrastructure development. Again, mainstream tiger conservation efforts into the rural development agenda.
- Significantly reduce the risks that tigers and their prey pose to the lives and livelihoods of people who live and work in their proximity so that conflict is below tolerable thresholds.
- Even with successful measures to reduce risks, conflict will arise: tigers will kill livestock and sometimes people; prey species will deplete crops. Effective means to swiftly resolve those conflicts, such as compensation or insurance programs, are required.

What management capacity is required to make this possible?

- A cadre of professional leaders, managers, and staff at all levels working on the ground in tiger protected areas, corridors, and local communities, with appropriate skills and adequate tools, as discussed below.
- Institutional arrangements, policies, and practices that support, monitor, and provide high-value incentives for that cadre of professionals to succeed in stabilizing and restoring the tiger populations entrusted to them.
- Networks of collaborators, colleagues, and partners within and among tiger range states, as well as regionally and internationally, through which knowledge is shared. These networks must be developed among protected area professionals, the scientific community, civil society, and governments.
- Government, business, and public support for tiger conservation that translates into adequate funding, effective policies, and engagement in regional and international programs related to tiger conservation. This is often summarized as “political will.”

### **Building Management Capacity for Individuals, Groups, Organizations, and Institutions**

The previous elements of capacity to conserve tigers reflect widely accepted definitions of capacity and capacity building in the development and conservation communities. Most broadly, “...In a global context, “capacity” refers to the ability of individuals and institutions to make and implement decisions and perform functions in an effective, efficient and sustainable manner.” More narrowly, the GEF defines environmental capacity as “the ability of individuals, groups, organizations and institutions to address environmental issues as part of a range of efforts to achieve sustainable development.”<sup>17</sup> Further, the GEF defines capacity building (also called capacity development) as “the process by which capacity in environment and appropriate institutional structures are enhanced.” Capacity building, whatever the sector, encompasses a country’s human, scientific, technological, organizational, institutional, and resources capabilities.

Capacity building addresses at least three levels: individual, organizational, and societal. Individual capacity is the ability of individuals to learn, gain knowledge and skills that can be expanded when new opportunities arise. Individual capacity also address the not insignificant problem of ensuring that the right people are in place, that is, highly motivated, incorruptible individuals who are committed to excellence. Organizational capacity is about people working together on a common cause, including building institutional capacity and reforms that are owned and driven by countries themselves. Organizations can be formal, such as a government agency or an NGO, or informal such as people's cooperatives, network of associations, and

business or professional groups. Societal capacity refers to the overall incentive environment as well as the rules and norms under which people and organizations operate. Societal capacity also refers to the broader political and cultural environment, and the civil engagement of societal actors. It includes the ability of societies as a whole to allow and support the use and growth of individual people's capacities and to prevent loss of skills or brain drain of countries.

With the tiger as the focus of concern and an umbrella species, capacity building refers to investment in people, organizations, and societies so practice and policy enable countries to achieve their biodiversity conservation and environmental sustainability objectives. It requires a coordinated process of deliberate interventions at all levels. Too often, training at the individual level, however effective in enhancing knowledge and skills, is wasted because the organizational structures are not in place to allow individuals to implement what they have learned, and/or society insufficiently values the results. For example, a protected area manager may successfully interdict poachers but the justice system may not work to effectively prosecute offenders and society may not value tigers enough to impose meaningful punishments.<sup>18</sup>

## **Effective Managerial Capacity Building**

The GEF<sup>19</sup> has identified key characteristics that facilitate capacity development. These key characteristics can become strategic targets with actionable goals and objectives to improve managerial capacity at all levels. These characteristics are broadly applicable, see for example ref. <sup>20</sup>. In this paper we focus on public sector institutions, task networks, organizations, and human resources; these are nested in a broader setting, which we include here for context:

### **The Political, Economic, and Social Setting**

- Sustained economic growth with rising wages and low inflation;
- Reasonable parity between public and private sector salaries;
- Legitimate and stable political system;
- Open and participatory government;
- Leadership commitment to a vision of national development;
- Social consensus or lack of deep social conflict.

### **Public Sector Institutional Setting**

- Clear rules that facilitate action and encourage problem-solving and innovation by organization and officials;
- Public service systems for recruitment and promotions that reward merit and performance, not patronage and seniority;
- Sufficient budgetary resources to support the sector activity;
- Salaries that are attractive to highly motivated people;

- Reform programs that emphasize adequate salaries linked to level and performance, improvement in organizational management, problem-solving orientation of the public sector, development of key skill for general and critical competencies (see below), incentives for superior performances of organizations and individuals, and elimination of ineffective workers and unnecessary tasks.

#### Task Networks

- Effective capacity across multiple organizations that must collaborate to accomplish essential tasks;
- Policy frameworks that define goals for coordinated action;
- Specific mechanisms for frequent interaction across organizational boundaries;
- Horizontal interactions within levels of government performing a common task;
- Common training institutes or programs that bring together staff assigned to different organizations but involved in the same task;
- Clear organizational responsibilities.

#### Organizations

- Strong mission mystique held widely within the organization;
- Recruit motivated and competent staff;
- Raising salary levels and competitiveness with private-sector salaries;
- Strong sense of professional identity within the organization;
- High prestige of the organization and links to high-prestige domestic and international peer groups or organizations;
- Equity, participation, and flexibility in work assignments;
- Participation in organization decision making;
- Managers focused on performance, incentives, participation, and problem solving;
- Ability to demote and fire unproductive or unprofessional staff;
- Adequate physical environment and equipment;
- A rewards and recognition system for high performance.

#### Human Resources

- Links between training institutions and task-orientated organizations;
- Training in management;
- Training opportunities linked to commitment to the organization;
- Recruitment managed by the organization (rather than by the civil service);
- Open and competitive recruitment procedures;
- Meaningful jobs assigned to those with appropriate skills and levels of training;
- Job satisfaction;

- Professional identification among staff, reinforced by professional associations;
- Contracts of limited durations with clear links to performance criteria.

### **Box 1. Terai Arc Landscape (TAL): A Case Study of Conservation Governance and Leadership at the Base of the Himalayas**

The tall grassland-savannah and forest ecosystem along the base and inner valleys of the Himalayas—known as the Terai in the west, or Duars further east—harbors a rich biodiversity that qualifies as a global conservation priority. Unfortunately, the Terai is one of the most fragmented and threatened ecosystems in Asia. Less than 2% of the continuous expanses of natural habitat remain in a few remnant patches which are mostly within protected areas and forest reserves.

The socio-economic status of the people who live in the Terai justifies a need for biodiversity conservation. Many of the people are poor, living beneath the poverty line, and depend heavily on forest products for livelihoods and everyday uses. Because there are links between poverty reduction and biodiversity conservation, conservation of the forests in the landscape matrix for the benefit of the local people is an important goal for governments.

Since 1999, government, academic, and NGO-based conservationists, have been working to restore, reconnect, and manage wildlife populations the 12 wildlife reserves and national parks that harbor wild tigers in the TAL. The goal is to establish a meta-population of at least 500 tigers. Tiger occupancy in the TAL has been described for India and for Nepal. Significant breaks in the forest create at least three tiger subpopulations among which connecting corridors need to be restored. The goal is to manage the tigers as a single meta-population where dispersal between core refuges can maintain genetic, demographic, and ecological integrity and provide sustainable livelihoods for the people living within the TAL.

#### **The TAL in Nepal**

The Government of Nepal has been engaged in community forestry programs since 1976, in which degraded state forests are handed over to local community forest user groups for management. Since the communities have usufruct rights and benefit by harvesting timber and other forest products, based on management prescriptions approved by the Forest Department, there is a vested interest among the local communities to restore and protect these forests. Because of the high productivity of the Terai, regeneration of areas protected from degradation is rapid. Community forestry is therefore a viable land-use option for habitat restoration because it also elicits the support and stewardship of the local communities in restoring and conserving buffer zones and corridors.

Despite the daunting challenges at the beginning, and those that emerged once the project began, the TAL has achieved some successes in its relatively short history. The first step in the design and planning process was a reconnaissance survey to assess the feasibility of establishing corridors between the protected areas. Satellite images were ground-truthed for forest cover to confirm the status of the habitat, especially in the landscape matrix and corridors identified by a GIS model of potential tiger corridors. Extensive consultations were held with various stakeholders, including forest and wildlife staff, district- and central-level government officials, and community groups and community leaders, to

discuss the concept and feasibility of the conservation plan, acquire local knowledge about forest conditions, and seek local support. The initial consultations were informal and held in small groups. Since the feedback was positive, the next step was to conduct a series of regional workshops to include wider stakeholder groups and formalize the support and commitment.

A 10-year strategic plan was then developed with the participation of all the key donors working in TAL, particularly in the natural resource management sector. This plan identified the strategies necessary to avert further environmental degradation and loss of biodiversity and to restore critical corridors and habitats. The TAL was also included in Nepal's 10<sup>th</sup> 5-year plan (2002-2007) as the government's conservation strategy in the Terai, which 'formalized' government endorsement of the TAL program and landscape. A complementary TAL Implementation Plan with priority activities was then developed based on the strategies.

The program areas for the TAL include policy and advocacy, institutions and coordination, sustainable forest management, sustainable development, species and ecosystem conservation, Churia Hills watershed conservation, and awareness and education. The TAL—Nepal Strategic Plan has three components: broad strategy development, partnership plans, and a business plan. The principals of the TAL monitoring and evaluation program include:

- Adapting lessons learned from programs and feeding the results back into program planning and implementation;
- Documenting lessons learned and sharing them with implementing partners and stakeholders;
- Being participatory in the process of monitoring by involving communities, the implementing government bodies, and other organizations;
- Ensuring that the programs are transparent to local communities, local government, donors, and the general public.

A formal Steering Committee with representation from the central government, donors, and NGOs active in the TAL was formed and chaired by the Secretary to the Ministry of Forests and Soil Conservation. This committee is responsible for coordinating and implementing TAL activities in a timely and efficient manner, and for providing information to the donor community about the financial and program status of TAL. The steering committee is guided by business and partnership plans that also provide a projected budget necessary to implement TAL activities and identifies partners' commitments to projects that are ongoing or in the pipeline to enable coordinated forward planning.

Another important function of these plans is that they help foster collaboration and dialog among the various organizations, donors, government, and NGOs. For example, more than 11 bilateral and multilateral agencies work in Nepal's 14 TAL districts. From 2000 to 2002, the NGO investment in tigers and related conservation projects, including non-government costs supporting park management, anti-poaching, monitoring, research, and habitat restoration, was just under \$1.4 million (\$25/ km<sup>2</sup>), or about 10% of what the Government of Nepal earmarked for conservation in the region in 2004.

The wildlife conservation objectives are:

- To restore key corridors connecting protected areas;

- Restore key species, such as rhinos and swamp deer, in protected areas;
- Curb poaching in the wildlife corridors;
- Strengthen the management of all protected areas;
- Establish agreements between Nepal and India for tracking the movement of poachers and wildlife across borders;
- Protect and where necessary rehabilitate the TAL watershed;
- Create incentive schemes, especially those that empower women, so that people will profit from stewardship of wildlife. The latter is a key to the success of the entire effort.

A model based on the success of small-scale projects to promote local guardianship of wildlife and forest and grassland management on degraded lands adjacent to the Chitwan National Park is being implemented in lands adjacent to other protected areas and in key connecting corridors through the TAL. The long-term impact of these efforts on tigers, while encouraging, remains to be fully assessed. In particular, the monitoring of tiger populations needs to be systematically addressed.

**Source:** Eric Wikramanayake, Anil Manandhar, Shyam Bajimaya, Santosh Nepal, Gokarna Thapa, Kanchan Thapa. In Press. The Terai Arc Landscape: A tiger conservation success story in a human-dominated landscape. In R. Tilson and P. Nyhus, eds. *Tigers of the World (2<sup>nd</sup> edition): The Science, Politics, and Conservation of Panthera tigris*. Elsevier/Academic Press.

## Building Core Competencies in Protected Area Management

The leaders, managers, and staff of protected areas are on the front lines of tiger conservation. In this paper we focus our attention at the level of the protected area as a case study in harmonizing management capacity to address emerging threat and the tasks required to save tigers. Equally important are programs to foster community stewardship of conservation in protected area buffer zones and corridors, to contain the illegal wildlife trade, mainstream tiger conservation into the rural development agenda such as those that address poverty around protected areas<sup>21</sup> (see Box 1 and Box 2), and champion smart infrastructure development<sup>22</sup>. All tiger range states have some social and organizational capacity for tiger conservation, that is, in all, tigers have been declared endangered, protected areas have been set aside and staffed, it is illegal to kill tigers, most are parties to CITES and the Convention on Biodiversity, and many have national Tiger Action Plans (TAPs).

Effective protected area management is fundamental to tiger conservation. We can turn for guidance to the recent global study of management effectiveness<sup>23</sup> in protected areas. This study found that 65% of the assessed protected areas had “management with significant deficiencies.” Only 21% scored in the “sound management” range. We don’t have baseline studies of management in all protected areas across the tiger’s range from which we can derive a “gold standard” for protected area management to support tigers. There are 342 protected areas that contain 23% of the land area found within all Tiger Conservation Landscapes.<sup>24</sup> We do have the work done in the Indian Subcontinent protected areas and protected area complexes that used a

landscape-scale, density-based population model to ask: Where can tigers persist in the future? <sup>25</sup> India completed an initial review in 2006 (see below) and is redoing their assessment of tiger reserves using the IUCN methodology.

The critical finding of this global study that can inform the development of protected area managerial capacity is that *management outcomes were most strongly correlated with strong research and monitoring and resource protection, coupled with communications, involvement of local communities, and programs of community benefit*. Overall, management effectiveness was most strongly linked to adequate infrastructure, equipment, and information; good management planning; high levels of communication; visitor management and community participation; professional resource management, research, and monitoring; and good governance and administration. As pertains to tigers, effective management needs to be established through goals that are designed to reduce risk to and increase the persistence of tiger populations. Management outcomes have to be carefully monitored. Otherwise, you can have a management team in place, but the tigers may still disappear.

In the global study, there were clear patterns in the strengths and weakness of different aspects of protected area management and most of these were consistent across regions of the world. These lessons can inform the management of protected areas with tigers. The most serious threats that protected area managers face are poaching (hunting and fishing) in the protected

### **Box 2. The long-view on strategic approaches to sustaining and recovering wild tigers.**

This box provides an analysis of factors that shape opportunities to address the root cause of the “saving the tiger” problem. Range-wide collapse of tiger populations is a reflection of a systemic crisis that continues to deplete Asia’s forest resources. Poaching, illegal trade, deforestation, habitat degradation, invasive species, arson, and other forest crimes threaten not only biodiversity but also sustainable development and the livelihoods of disadvantaged people. Cross-sector, systemic changes in governance, policies, and management should be put in place to address the root cause of the problem—the economic incentives to convert and fragment habitats and poach tigers for the urban consumers of South and East Asia (See ref. 5).

The following factors shape the opportunities to save wild tigers from extinction.

- **Different conservation and management strategies for protected areas (23% of 19 million hectares of tigerland) and for production landscapes (77%).** The “saving the tiger” strategy should have a set of different approaches for (i) strict protection, with no use, for conservation in core tiger breeding areas, (ii) sustainable use of buffer zones, managed by communities next to protected areas; and (iii) management, with sustainable use, of tigerland controlled by other institutions in productive landscapes.
- **Multiple resources and use values of tigerland in developing and growing Asia.** Tigerland is covered predominantly by forest. Besides renewable forest and wildlife resources, tigerland has rich mineral resources (coal, oil, natural gas, gold, bauxite, etc.) and provides ecosystem services, such as

clean water, control of soil erosion and natural catastrophes, climate and weather regulation, etc. With tripled human population (from 1.3 in 1950 to 3.4 billion people in 2010) and the ever-increasing pace of globalization (faster communications and transportation, wider and more easily accessible distant markets), demand for these resources and pressure to legally or illegally use them has been growing and will continue to do so.

- **Conservation and sustainable use linked with the rural development agenda.** Setting aside areas of tigerland for protection or conservation failed to address poaching, encroachment, and other forest crimes. A new tiger conservation paradigm has to bring local people and their needs into the conservation equation. Continuing to focus exclusively on tiger protection will uncouple tigers from revenues and economic values associated with wildlife, forests, and other resources of tigerland (See Box 1). This will be even more important in the next 20-40 years with increasing human population in Asia.
- **Balance of urgently needed enforcement and longer-term management of natural resources.** While harsh measures may be needed to suppress poaching of tigers and prey during the crisis, it is proper governance, policies, institutions, and natural resource management systems that establish and sustain control of resource use over time. Law enforcement, as a part of the management system, cannot address the absence of management planning and implementation, uncontrolled or corrupt infrastructure development, or unrelieved poverty of local communities that rely on their customary rights to use forest resource. No matter what property regime controls (on paper or in real) the tigerland and its resources—state, traditional commons, or private—there is a need for sound management practices and rules that would plan activities, monitor trends, estimate sustainable use rates, and control them.
- **Continuous dialog and change.** Nations that have wild tigers need to find their own answers—by means of research and dialog—to some important questions:
  - Why, if at all, wild tigers and their habitats are important for a nation, now and in the future?
  - What is tigerland, what kinds of resources, services, values, and interests does it generate?
  - What will happen to tigerland and the people living there if tigers are gone?
  - How to balance the competing economic interests that tigerland generates in order to save functioning tiger ecosystems for the sake of people, tigers, and tiger range states and the global community?
  - If wild tigers are important to a nation, what sectors of national and regional economies have to adjust, and how?
  - How to customize global knowledge and experience in multiple-use of forest lands to local and national interests and conditions?
  - How to transform local economies and livelihoods to ensure people living in tigerland support and protect wild tigers?

areas; logging, wood harvesting, and collecting non-timber forest products; housing and settlement within protected areas and resulting issues; recreational activities--mostly unregulated tourism; activities on adjacent lands including urbanization, agriculture, and grazing; grazing and cropping within protected areas; fire and fire suppression; pollution; invasive species; and mining and quarrying.

The seven most unsatisfactory aspects of protected area management include: lack of appropriate programs of community benefit and assistance; lack of security and reliability of funding; inadequate current funding; low management effectiveness evaluations; inadequacy of building and maintenance programs; lack of effective communication programs; and lack of involvement of communities and stakeholders in setting clear goals and objectives in implementation plans.

In 2005, the Government of India conducted a management assessment review of its 28 tiger reserves using the Management Effectiveness Assessment Tool developed by the IUCN World Commission on Protected Areas.<sup>26</sup> These findings were further analyzed<sup>27</sup> to identify the interventions that separated reserves with high scores for management effectiveness from those with lower scores. The more successful reserves, such as Kanha and Corbett, clustered together with higher than average scores for compatible land-use in the buffer zone and beyond the buffer zone, low human pressure, little livestock penetration, little cultivation, little fodder collection, low encroachment, tight control of overuse of tiger reserve resources, and high efforts toward sustainable development. Those tiger reserves that have not performed well, such as Sariska, Manas, and Namdapha, clustered together with lower than average scores for staff welfare measures, timely release of central assistance, presence of patrolling camps, staff welfare measures, and lack of prompt payment of compensation for cattle and human deaths.

Based on these findings and others, we believe there are at least two initial “points of entry” for building managerial capacity for tiger conservation: 1) the individuals who lead and manage protected areas (the level of director general, or their equivalent, and their lieutenants, the reserve heads) and 2) policy makers (ministers, secretaries). Structuring a management capacity building response that results in increased conservation effectiveness of core areas is a prerequisite to managing landscape-level programs (see Box 1). Managers who are equipped, well trained, and effective leaders also stand at the interface between organizational and societal capacity on the one hand and lower-level staff and the local community on the other. They are pivotal to building capacity above and below them. But they must also be supported by the policy makers who value the national treasures they are charged with protecting and sustaining, and understand the challenges they face in doing so.

Improved capacity interventions at the organizational and societal level are imperative too and the nature and urgency of the intervention needs will vary within and among tiger range states. Some protected areas are protected in name only and lack even basic infrastructure or trained (and paid!) staff. Others have well trained, dedicated managers but lack funding for essential equipment such as vehicles and communications. Others may be well resourced but lack the

management capacity to deploy their resources effectively. Critical for any effective reserve management are well defined goals and objectives to sustain or recover tiger populations, a measurable plan to achieve them, and the resources to do so.

The analysis above that focuses on PAs alone is not sufficient; it is important to focus on the quality of institutions – including governance, leadership, and law enforcement - at difference levels. The capacity development strategy, to be successful, has to be formulated as an integral part of a broader institutional environment within which individuals and organizations operate. This is premised on a new approach to capacity development, one in which interventions take into account the larger institutional and political context within which stakeholders are willing and able to undertake reforms and effect change themselves (see Box 2).

### **Identifying the Skills Professionals Need to Save Tigers**

The ASEAN Regional Center for Biodiversity Conservation reviewed the job expectations for protected area employees from managers to maintenance workers. This review identified 250 different skills in 17 categories that are needed at different levels and at different times by protected area staff. With these identified skills and competence standards, training can be designed to exactly match the job. The competence standards tool is available on-line at [http://www.aseanbiodiversity.org/index.php?option=com\\_docman&task=doc\\_details&gid=10&Itemid=130](http://www.aseanbiodiversity.org/index.php?option=com_docman&task=doc_details&gid=10&Itemid=130)<sup>28</sup>

The core competencies in protected-area management the ASEAN review found include:

- General personal and work skills;
- Financial and physical resource management;
- Human resource management;
- Staff development and training;
- Communication;
- Technology and information;
- Project development and management;
- Field craft;
- Natural resource assessment;
- Conservation management of ecosystems, habitats, and species;
- Socio-economic and cultural assessment;
- Sustainable development and communities;
- Protected areas policy, planning, and management;
- Site management; enforcement;
- Recreation and tourism;
- Awareness education and public relations.

The level and general responsibilities of protected area staff included directorial (strategic and programmatic responsibilities); managerial/higher technical (project, divisional management and/or high-level technical responsibilities); technical/ supervisory (supervisory/mid-level technical responsibilities); skilled worker (technical responsibilities with some team leadership); and laborer (non-technical responsibilities).

For comparison, we list the universal competencies that have been identified by the U.S. National Park Service in Box 3. The NPS further identifies competencies for each specific job classification, found at <http://www.nps.gov/training/uc/home.htm>

As mentioned earlier, in summing up the experience of identifying and establishing these ASEAN competence standards, John MacKinnon noted: "...it became clear that more skills are needed in the communication area than in biological knowledge. It became clear that more skills are needed at intermediate seniority levels than at the top! It became clear that a large proportion of necessary skills have not been properly recognized, have never been taught in current training programs."<sup>29</sup> The program for building capacity for managing core tiger areas can be structured around the core competencies that have been identified for leaders and managers.

### **One GTI Strategic Response for Expanding Managerial Capacity**

The World Bank is collaborating with the Smithsonian Institution to establish a Conservation and Development Practice Network that will be responsible for targeted training programs for senior policy-makers from tiger-range countries, field conservation practitioners, trainers (involved with training field staff), and professional staff of the World Bank and other development institutions. This Network is envisioned as a long-term community of mutually supportive practitioners within and among tiger-range countries who will provide conservation leaders and policy-makers with the advanced knowledge, tools, skills, and sustained support necessary for developing and implementing effective conservation strategies to support and recover wild tiger populations.

### **Box 3. U.S. National Park Service Universal Competencies**

**Mission Comprehension** - a thorough background and understanding of the 1916 NPS Organic Act and its many ramifications and the additional responsibilities that have been added to the NPS throughout its history; and a perspective of how the National Park System began as a part of the Conservation Movement that continues today.

**Agency Orientation** - basic comprehension of the structure and organization of the NPS at the park, cluster, field area, and Washington Office levels; an understanding of the structure and organization of the Department of the Interior and its place in the Federal Government; and the development of an insight into an individual employee's role in the NPS in particular, and in the Federal Government in general.

**NPS Operations** - a general comprehension of the basic operations of the NPS, especially at the park level; how these operations interact to fulfill the Mission of the NPS; and why visitors come to parks and how the NPS "manages" them.

**Communications Skills** - ability to communicate effectively with the public and employees in writing and speech; to use interpersonal skills to be an effective employee; and to exhibit basic computer abilities.

**Fundamental Values** - ability to exhibit certain attitudes and behaviors to accomplish an assigned job and to contribute to the overall health of the organization. These include leadership and teamwork behaviors; ethical behavior towards people and the organization; support of cultural diversity and fairness issues in the workplace; support of accessible parks and workplaces; an attitude towards safe behavior for one's self and for others; and mental and physical fitness.

**Resource Stewardship** - an overall understanding of the spectrum of resources protected by the NPS; the range of NPS responsibilities in managing these resources; the individual's role in resource stewardship; the planning process and its purpose in the NPS; and working with partners outside the agency to promote resource stewardship.

**Problem-solving Skills** - ability to analyze a problem, build consensus, make decisions, and practice innovation in various aspects of one's job.

**Individual Development and Planning** - able to work with one's supervisor and agency to plan a course of action for one's performance, career, and ultimately, retirement.

Source: <http://www.nps.gov/training/uc/whauc.htm>

Within the context of this initiative, it is important to understand why, in spite of many efforts and training over decades, tiger populations continue to dwindle. There have been some successes, but we have fewer and fewer examples of where these successes have been sustained over time. The question then is how will the new capacity initiative bring about the needed success over time? How can the WBI-SI partnership position itself and avoid the pitfalls of previous efforts and embark on a highly innovative effort that will produce sustained impact on the ground leading to stabilizing and ultimately restoring tiger populations? This may require not only focusing on tiger-specific training but also on leadership and change management, on repositioning institutions toward more progressive approaches to conservation, and on a massive communications effort.

This program is guided by the following propositions:

- Training and related capacity building will be planned and conducted in close collaboration with range-country practitioners, organizations, and institutions.
- Effective training tools in use by other conservation organizations will be employed to promote cross-sector understanding. For instance, the Open Standards for the Practice of Conservation, developed by the Conservation Measures Partnership,<sup>30</sup> “brings together common concepts, approaches, and terminology in conservation project design, management, and monitoring in order to help practitioners improve the practice of conservation. In particular, these standards are meant to provide the steps and general guidance necessary for the successful implementation of conservation projects.”
- Training for protected area management will focus on the core competencies noted above, tailored specifically to tiger conservation.
- Training is all well and good but well-intentioned training efforts often fail. A big problem is that people who are trained aren’t able to utilize the training, and trained individuals may be transferred or reassigned to other jobs following their training. Other reasons for training failure include real job demands preclude employing new knowledge; lack of resources necessary to implement new ideas; and trained individuals may be blocked by superiors from pursuing new approaches. Capacity building at the organizational and societal level is thus essential.
- Training will place emphasis on how to actually use training on the ground both in policy/management and conservation/wildlife management. Also, it is important to provide people with actualization and facilitation of existing skill sets and connect people in collaborative working relationships.
- It will establish a sustainable training system that not only trains people but facilitates their using new skills and knowledge, provides some of the basic resources necessary for

developing and implementing new ideas, and a support system that nurtures their development until they become established. The models for accomplishing this will have to be developed over the course of the program with strong input from the participants, but chief among these will include follow-up mentoring and peer-to-peer learning.

- Some part of the training effort can be academic training, such as enrolling participants in Ph.D. programs. However, the applied wildlife management/conservation component is essential for the program's success. Where academic training is supported, it should be multidisciplinary and include science-based conservation biology as well as management, communication, leadership, social, and other technical and interpersonal skills.<sup>31</sup>
- Training will acknowledge the critical need for socio-economic development and conservation incentives in human communities where conservation/management is taking place. This means that conservationists/wildlife managers need training in community education, economic development, and human-wildlife conflict resolution.
- Training will define carefully the target audiences for training and the content areas for that training to maximize effectiveness and realize short-term as well as long-term objectives.
- Countries and regions within countries may have different issues and needs, so training components will be tailored to individuals' needs.
- It is important to develop systems that foster policy makers and front-line conservationists/wildlife managers collaborating and working together. This will be a work in progress as the program unfolds and based on the input from the program participants. Specifically, it needs to get upper management and policy makers supporting front-line troops.
- There is a role for overseas training (e.g., in U.S. or Europe), but the program will put emphasis on in-country training. The program will focus initially on specific regions where training can have most rapid and sustained impact.
- The program will build a training structure in which collaboration and a sense of common purpose among all working on tiger conservation are established and maintained by sustained connections and camaraderie. This may involve team- and network-building and perhaps deliberately training people in diverse groups (e.g., managers, policy makers and biologists; mixing individuals from different countries and cultural groups, etc).
- There are many experienced and talented wildlife and park managers in tiger range countries and around the world with the resources and ability to help individuals and organizations engaged in on-the-ground conservation practice. As we move forward, enhanced technology capabilities will allow a new engagement and facilitate peer

learning, expand management knowledge, aid technology transfer, identify successful demonstration projects, provide planning assistance, and mobilize public opinion to recover and maintain viable wild tiger populations. Through enhanced communication technologies we can provide peer networking, mentoring, advising, and enable public participation in tiger conservation.

- The program will establish/operate strategically located “permanent” regional support hubs in appropriate range countries to provide sustained in-range training, and logistical, financial, and mentorship support to conservationists/wildlife managers and policy and decision makers.
- To be effective, this training and the conservation network must have clearly stated goals and measurable objectives and still be flexible enough to adapt as necessary.<sup>32</sup> It must be recognized, however, that an expert-based tracking tool is not sufficient for measuring the status and trend in the tiger populations. The science-based methodology is now available to do so.<sup>33</sup>
- Finally, insights into how to create, foster, and maintain leadership and management excellence should be sought not only from within the conservation community but also from corporate and other models.

The initial action steps that emerged from these principles are:

- Conduct a training needs assessment in tiger range countries, which is now in progress;
- Conduct a pilot training program to determine optimal practices for future training, including a “Training the Trainers” workshop for protected areas staff and conservation practitioners, and “Executive Leadership Training” for senior leaders and policy-makers from tiger range countries.<sup>34</sup> Develop mechanisms and systems for recruiting and training the next generation of conservationists/wildlife managers.
- Develop mechanisms and systems for providing sustained mentoring, training, and logistical and financial support for established front-line conservationists/wildlife managers so they can put their knowledge and skills acquired through training to productive practical use.
- Develop a system in which competent and motivated staff are selected and deployed into critical leadership positions to catalyze real change.

## **The Larger Context for Building Capacity for Tiger Conservation Management**

To provide a complete program of capacity building, one must build capacity in the “knowledge institutions” that are responsible for educating the target audiences. These range from governmental organizations, such as the Wildlife Institute of India (WII), to NGOs across the board, and even to public schools and universities. In this context, “capacity building” can mean many things. For example, for WII it may mean harmonizing the technical and teaching skills of its faculty, re-imagining and re-energizing its mission, and improving recruitment efforts to meet emerging conservation challenges. For NGOs, it may be more along the lines of providing more financial and logistical resources to expand excellent work that is already being undertaken. For general education, it may mean harmonizing the science and conservation curricula in schools and universities to meet emerging environmental challenges. In some countries, it may be a matter of supplementing and enhancing existing institutions, and in other countries, it may be a matter of actually helping to create them from scratch. These national and local knowledge institutions will have responsibility for delivering conservation capacity building in their own areas or countries. Many other organizations offer capacity building programs and tools relevant to tiger conservation. We will achieve the best and most rapid results through cooperation to create synergies, reduce redundancy, and share best practices.

## **Performance Indicators for Tiger Management and Recovery**

Monitoring, evaluation, and documenting results are an integral part of any capacity building program. Performance indicators are key to measuring and monitoring management effectiveness for wild tiger recovery.<sup>35</sup> Management effectiveness in relation to protected areas is of increasing concern. As a result, several evaluation methodologies have emerged, although they have not been readily adapted by many agencies. A more recent approach involves guidance to management on how to develop locally relevant assessment system.

The GEF has also developed indicators for capacity building to assess the overall impact of its support for capacity building and to assess the effectiveness of projects and country level programs. At the general level, indicators for capacity building address the following dimensions:

- Awareness and knowledge;
- National policy, legal and regulatory frameworks;
- Institutional mandates, coordination, and processes for interaction and cooperation among all stakeholders;
- Information management, monitoring and observation;
- Mobilization of science in support of decision making;
- Financial resources and technology transfer;
- Incentive systems and market instruments;

- Negotiation skills;
- Cooperation and networking within regions;
- Institutional management and performance;
- And individual skills and motivation in key institutions.

The performance indicators (PIs) for capacity building training programs are focused on application and results. They are cross-cutting with other major themes in tiger management and recovery because all these themes require trained people and with adequate resources to accomplish goals and objectives. *Our primary task now is to create consensus on the performance indicators for the management of core tiger breeding areas and apply them to guide the recovery of wild tigers. The next step is to apply these across entire tiger conservation landscapes.*

Here are our initial thoughts on performance indicators for recovering wild tigers (see also Box 4):

- Effective levels of staffing and patrolling achieved, and protection efforts established and functional. Method: Apply advances in patrolling, anti-poaching information networks, and improved trans-boundary cooperation in to contain illegal wildlife trafficking. Protection protocols designed and monitored for each core breeding area with adequately trained staff and supporting budget (see Box 4).
- Excellent leadership in key areas (PAs and corridor/buffer zones) to motivate staff and ensure effective implementation of interventions and management of tiger habitat and populations. Method: Develop a system in which leaders and senior management staff are selected based on performance and not automatic promotions or arbitrary criteria.
- Establish national and international networks to control and prosecute illegal wildlife trafficking.
- Effective monitoring programs for tigers and prey are in place in the core tiger breeding areas in each Tiger Conservation Landscape. Even with adequate funding we need to know if our interventions are having the desired effect.<sup>36</sup> This will require adequately trained staff, a supporting budget, and a peer-reviewed science-based methodology.
- Incentives for community based-conservation in buffer areas and corridors that are sensitive to the local context, work, and are funded (see Box 1).
- Communication networks among professionals within and among tiger range countries established and working to create a community of practice.

**Box 4. Possible performance indicators.**

Performance Indicators	Questions	Comments/Suggestions
<p><b>Indicator 1:</b> Effective levels of staffing and patrolling achieved, and protection efforts established and functional.</p> <p><b>Measure:</b> For protection schemes, number of patrols is focused on areas of highest poaching risks.</p>	<p>Since measures are constrained to high-risk areas (core breeding areas), are there patrols in low risk areas?</p> <p>How can the effectiveness of patrolling be measured? E.g., # of tigers on patrolled areas poached. Or conversely, is the number of breeding tigers and cub survival stabilized and/or recovering to carrying capacity.</p> <p>Are current patrols working without enough staff?</p> <p>Should we include some output measures on # of trained staff and % of trained staff on teams?</p>	<p><u>Proposed output indicators:</u></p> <p>1) Effective staffing and patrolling in place (measures: # of patrol staff trained, # of patrol staff assigned per breeding area grid, % of patrol hours covered per week as planned).</p> <p>2) Protection efforts established and functional (measures: protection protocols designed (Y/N), # of monitoring staff trained, # of monitoring reports submitted, anti-poaching information network established (Y/N)).</p> <p><u>Proposed outcome indicators :</u></p> <p>Reduction of poaching in breeding areas (measures: # of poaching declined, # of poaching attempts intercepted).</p> <p>Number of breeding tigers and cub survival stabilized and recovers to carrying capacity.</p>
<p><b>Indicator 2:</b> Establish national and international network to control illegal wildlife trafficking. Even if patrols catch local poachers, there will be no effect unless the culprits are caught and convicted.</p> <p><b>Measure:</b> Track arrests and convictions and the implementation of other measures that are used in controlling gang-related crime.</p>	<p>What are the measures for outcomes?</p> <p>What is our target? Reduction of illegal wildlife trafficking? If yes, how will we know when this target is achieved?</p> <p>The key underlying assumption is that the higher the conviction rate, the better deterrence for future poachers. If the poacher is caught, he/she will be convicted. Has this been validated in local contexts?</p> <p>Are the risks of being convicted small compared to the benefits?</p>	<p><u>Proposed output indicators:</u></p> <p>In addition to # of arrests, % of convictions in cases where arrests have taken place is an essential output. A measure of a successful trend is that the number of poachers arrested rapidly approaches a 100% conviction rate.</p> <p>National and international network established (Y/N); # of trainings conducted through the network to control illegal trafficking.</p> <p><u>Proposed outcome indicators:</u></p> <p>1) Functional national and international network (measure: # lobbying activities conducted)</p> <p>2) Local law revised (measure: Y/N)", "Poachers caught and convicted (measures: % of captured poachers convicted)</p> <p>3) Reduction of poaching in breeding areas (measures: # of poaching declined, # of poaching attempts intercepted).</p>

<p><b>Indicator 3:</b> Effective monitoring programs for tigers and prey are in place in the core tiger breeding areas in each Tiger Conservation Landscape.</p> <p><b>Measure:</b> Targets to be determined for tigers, prey, or both in each core area.</p>	<p>Was a peer review of M&amp;E system executed?</p> <p>Are data being collected?</p> <p>What are the outcomes of the monitoring program?</p> <p>Are the data being used?</p> <p>Are the recommendations being adopted?</p>	<p><u>Proposed output indicators:</u></p> <p>% of baseline data collected?</p> <p>% of measures collected at planned intervals, e.g., are target and prey indicators recorded?</p> <p>% of reports produced and planned?</p>
<p><b>Indicator 4:</b> Incentives for community based-conservation in buffer areas and corridors funded and accessed.</p> <p><b>Measure:</b> amount of resources raised and accessed each year in tiger conservation landscapes for community-based activities generated by tiger conservation efforts.</p>	<p>Amount of resources raised and accessed are input indicators. What are the output and outcome indicators?</p>	<p><u>Proposed output indicator:</u></p> <p># of community based activities conducted?</p> <p>Level of satisfactions of local communities to the incentives for communities-based conservation in buffer areas and corridors in high.</p> <p><u>Proposed outcome indicators:</u></p> <p>1) % of unprotected tiger habitat with incentives for conservation among community.</p> <p>2) Improved willingness to conserve tigers by communities in buffer areas and corridors” (measure: Community leaders’ survey (or interviews) to assess willingness to participate in conservation activities).</p>
<p><b>Indicator 5:</b> Communication networks. Create far reaching public awareness campaigns. Identify processes for annual update on the state of tiger lands.</p>	<p>What are the outcomes to be achieved through these campaigns?</p>	<p>Indicators should be beneficiary centered and may include citizen surveys to understand the effectiveness of the public awareness campaign. This should be considered and integrated into a results indicator. Perhaps the development of incentives to conserve among communities (Indicator 4) is an anticipated outcome from the outputs related to the communications network component?</p>

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<sup>29</sup> J. MacKinnon p. v in Appleton et al. 2003

<sup>30</sup> CMP: Conservation Measures Partnership [www.conservations.org](http://www.conservations.org)

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<sup>33</sup> See ref 14.

<sup>34</sup> The Executive Leadership Training is being developed to reach senior policy and decision-makers to strengthen their capacity to successfully integrate conservation principles and practices into their agenda and successfully implement priority conservation action steps defined in range country tiger action plans.

<sup>35</sup> See ref 32.

<sup>36</sup> See ref 11.