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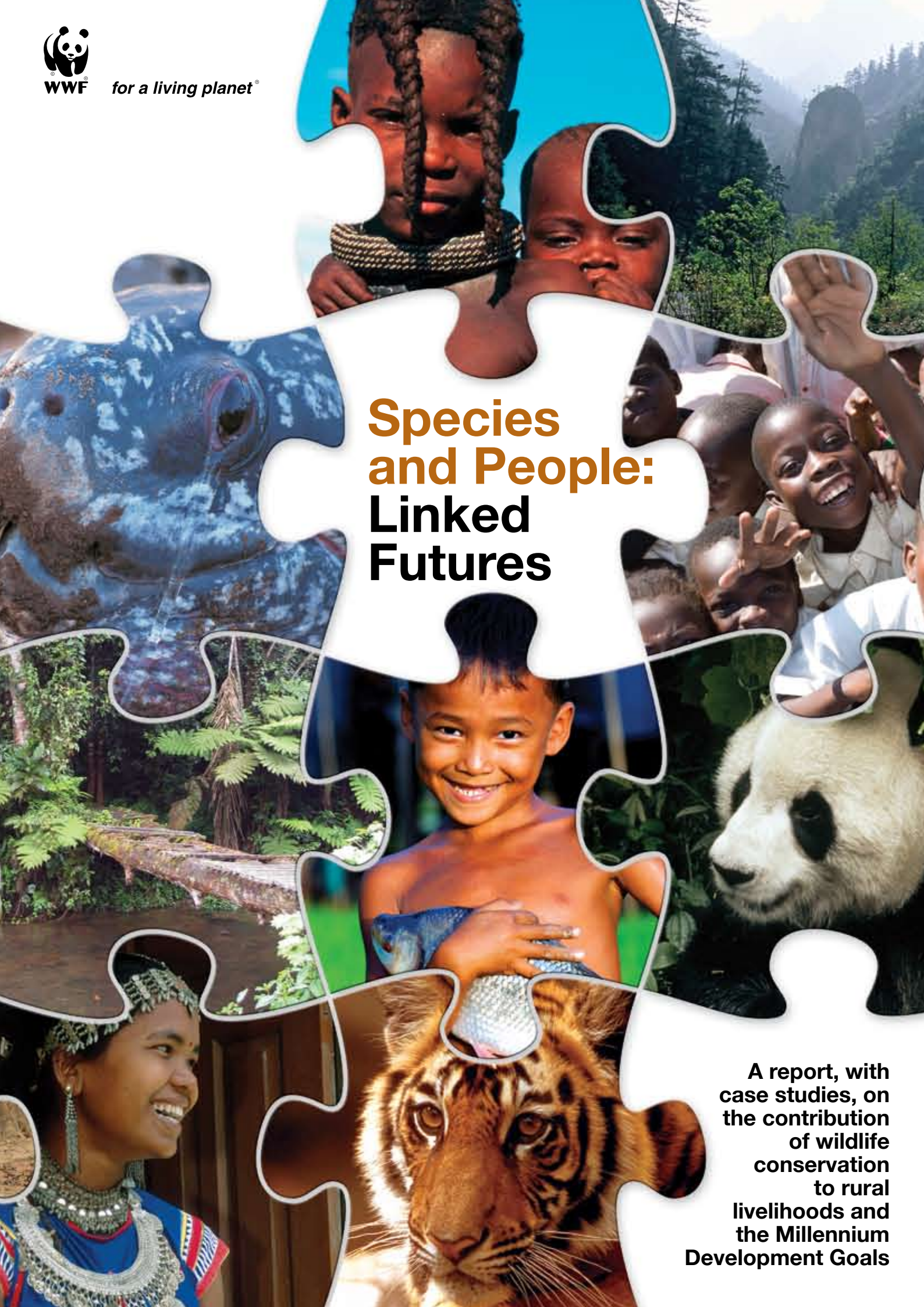

Species and People: Linked Futures

A report, with case studies, on the contribution of wildlife conservation to rural livelihoods and the Millennium Development Goals

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Integrating sustainable livelihoods with tiger conservation in the Terai Arc Landscape, Nepal
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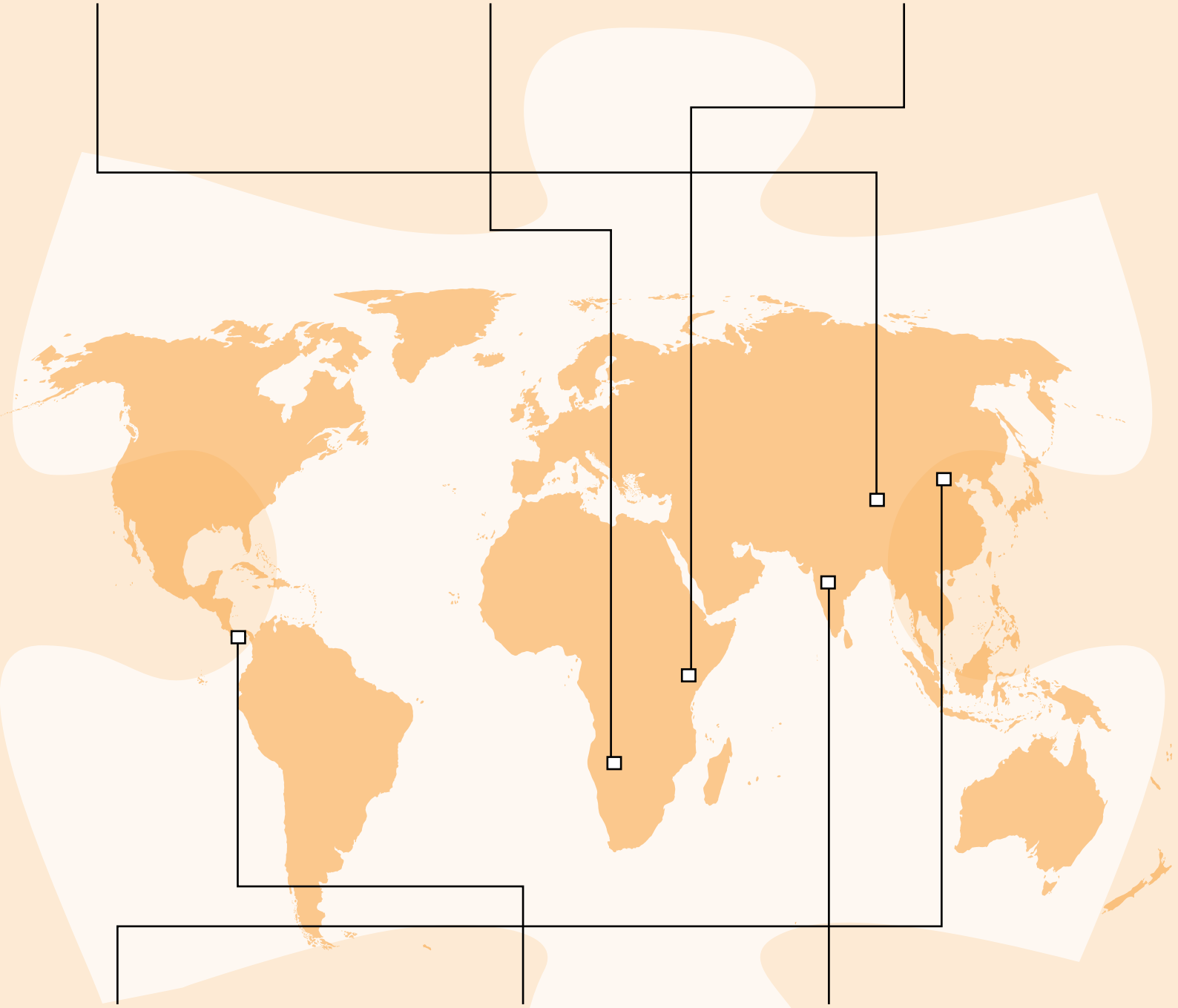

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Foreword

Dear readers,

It is with great excitement that WWF introduces “Linked Futures”. This report has been produced to demonstrate how species conservation contributes to sustainable development – indeed, how conservation for threatened species adds up to more than enhancing the population of a species and its eventual recovery.

Why did WWF prepare this report? Just imagine if you will a world without wildlife… it is, in fact, unimaginable. Species and the ecosystems they form, inhabit, and are dependent upon are the cornerstones of life. At the same time, these ecosystems and species are fundamental to human livelihoods and economic growth.

Species are essential to human societies as cultural and religious symbols, commodities, food, fibre, and transport. Species also play a vital role in ensuring environmental services such as clean water and fertile soil.

It is critical to maintain and enhance healthy ecosystems and species populations not only in and of themselves, but because they are vital to the lives and well-being of rural communities dependent on them for their survival.

This report shows how species conservation programmes can and do reduce poverty, increase participation by women in society, improve governance structures, increase food security and, of course, deliver a sustainable environment for future generations.

“Linked Futures” is the result of original research using several species conservation field programmes as case studies. These determine and describe the contribution of species conservation to human social and economic development — particularly the rural poor.

The world continues to face the worst human-induced extinction crisis in history. Despite the existence of a large number of global, regional and national instruments to conserve threatened and endangered species, the sad reality remains that we continue to watch the decline of huge numbers of species each year.

Simultaneously, around the world we see billions of dollars being spent to reduce poverty and promote sustainable economic development – often with inadequate attention to the link between sustainable development and a healthy environment.

In many parts of the world, it cannot be denied that the dynamics which threaten species are also those which contribute to poverty, such as loss of habitat and its riches, unsustainable depletion of the natural resource base, inequitable access to natural resources necessary for life, and a lack of appropriate governance and management mechanisms.

Modern species conservation is about conserving and managing a world for both species and people. All over the world, work is taking place that shows the vital link between species conservation and better economic, social and cultural outcomes for local communities.

WWF’s mission is to stop the degradation of the planet’s natural environment and to build a future in which humans live in harmony with nature, by: conserving the world’s biological diversity; ensuring that the use of renewable natural resources is sustainable; and reducing pollution and wasteful consumption.

A species conservation approach that is integrated with human needs is fundamental to the fulfillment of this mission.

The challenge for governments, scientists, industry, non-governmental organizations and communities is to embrace both the challenges and the opportunities of species conservation and to deliver integrated conservation and development outcomes. The results will improve the status of species and the communities, which, ultimately, are the custodians of their habitats and populations.

This report analyses case studies involving tigers in Nepal, wildlife in Namibia, gorillas in Uganda, giant pandas in China, marine turtles in Costa Rica, and river dolphins in India.

We hope this report will help decision makers, conservationists, development experts, politicians, funders and interested individuals embrace this challenge. The future of people and species is clearly linked.

Together, we must make sure our collective global action is also linked.

Dr Susan Lieberman

Director, WWF Global Species Programme

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Abbreviatons & Acronyms

AWF	African Wildlife Foundation
BINP	Bwindi Impenetrable National Park
BZUC	Buffer Zone Users Committee
CBD	Convention on Biological Diversity
CBNRM	Community Based Natural Resource Management
CCC	Caribbean Conservation Corporation
CFM	Collaborative Forest Management
CFUG	Community Forest User Groups
CSD	Commission on Sustainable Development
DFID	Department for International Development
DRC	Democratic Republic of Congo
DWIDP	Department of Water Induced Disaster Prevention
EC	European Commission
EIA	Environment Impact Assessment
FFI	Flora and Fauna International
GDP	Gross Domestic Product
GEF	Global Environment Fund
GP	Gram Panchayat
Ha	Hectare
HACCC	Human Animal Conflict Conservancy Compensation
HDI	Human Development Index
HPI	Human Poverty Index
HUGO	Human-Gorilla Conflict Resolution Programme
ICDP	Integrated Conservation and Development Programme
ICT	Costa Rican Tourism Board
IDS	Social Development Index
IFC	International Finance Corporation
IGCP	International Gorilla Conservation Programme
INEC	National Institute of Statistics and Census
IRDNC	Integrated Rural Development and Nature Conservation
ITFC	Institute of Tropical Forest Conservation
LDC	Least Developed Countries
LIFE	Living in a Finite Environment
IIED	International Institute for Environment and Development
IUCN	The World Conservation Union
Kgs	Kilograms
Kms	Kilometres
MBIFCT	Mgahinga and Bwindi Impenetrable Forest Conservation Trust
MDG	Millennium Development Goals
MFSC	Ministry of Forests and Soil Conservation
MGNP	Mgahinga Gorilla National Park
MINAE	Ministry of Environment and Energy
MOAC	Ministry of Agriculture and Cooperatives
MOU	Memorandum of Understanding
MUZ	Multiple Use Zones
NACSO	Namibian Association of CBNRM Support Organisations
NBI	Basic Needs Not Satisfied Index
NCDF	Nkuringo Conservation Development Foundation
NCPGPH	National Conservation Programme for the Giant Panda and its Habitat
NEG	Nature Exploration Group
NGO	Non-Governmental Organisation
NTFP	Non-Timber Forest Product
PRA	Participatory Rural Appraisal
PRI	Panchayati Raj Institutions
PRSP	Poverty Reduction Strategy Paper
RCA	Root Causes Analyses
RCNP	Royal Chitwan National Park
SDI	Social Development Index
SNV	Netherlands Development Organization
TAL	Terai Arc Landscape
UGs	User Groups
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
UWA	Uganda Wildlife Authority
VBRC	Vikramshila Biodiversity Research Center
WB	World Bank
WCS	World Conservation Society
WILD	Wildlife Integration for Livelihood Diversification
WRI	World Resources Institute
WWF	Worldwide Fund for Nature

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Executive Summary

Executive Summary

The habitats of many threatened and endangered species are also home to some of the world's poorest and most vulnerable people. Whether in the Terai lowlands of Nepal, the floodplains of the Caprivi in Namibia, or the Afromontane forests of Uganda, the issues that threaten species are often the same as, or closely related to, some of the root causes of poverty. These include the marginalization of rural communities, weak governance and political instability. Sustainable environmental management that occurs hand-in-hand with development can create a real future for the world's poorest and most vulnerable people, and also halt species extinction. It is the rural poor who live in natural areas and use natural resources for their survival. To truly attain sustainable development, it is these rural people who must be the able to conserve and manage the natural resource base.

The Millennium Development Goals, or MDGs (UN, 2000) are the guiding framework for development assistance and commit the international community to halving poverty by 2015 (see Appendix 1). However, though environmental sustainability is recognized as essential to development (Goal 7), and biodiversity conservation efforts are acknowledged (EC/DFID/IUCN, 2001) for their role in meeting human needs, the reality is that biodiversity conservation and management are still marginalized in development frameworks and funding. This is particularly true for species conservation, which has suffered from the misconception that it has little to do with people and their development priorities. The reality is the converse: species conservation can and does deliver on, *inter alia*, poverty reduction and livelihood improvement.

Species conservation programmes are helping to eradicate extreme poverty and hunger (MDG 1)

- All of the six projects selected for this report include major programme components for building local capacity for diversifying farm and off-farm income to reduce human pressures on wildlife and their habitats
- Species conservation projects are working to attain and strengthen local user rights over their natural resources on which their livelihoods depend. In Namibia, the programme is helping to form conservancies (local resource management committees) that provide a legal mandate for wildlife use. Over 7 million hectares of communal land are now managed as communal area conservancies (NACSO, 2004)
- Poor rural communities are benefiting through employment, social empowerment, income generation and access to meat. In Nepal, a tiger conservation programme at the landscape level is supporting the formation of Community Forest User Groups (CFUGs) that allow local people to manage and utilize their forest resources for household use (firewood, non-timber forest products, fodder, etc.) as well as community income through the sale of timber. Wildlife and nature-based tourism have been promoted in Costa Rica, Namibia, Uganda and China. Gross revenue of sea turtle tourism in Tortuguero, Costa Rica, in 2002 alone is estimated at US$6,714,483 from board, lodging, and transportation services, as well as souvenir sales, national park and guided tour fees (Troëng & Drews, 2004). Elsewhere in Namibia, joint ventures between the conservancies and private sector earned a total of US$582,332 during 2003 (NACSO, 2004). Rural infrastructure has also been supported, such as small irrigation systems, subsidiary roads and trails in remote areas, health centres, schools, drinking water schemes and micro-hydro projects.

Species conservation programmes are helping to promote gender equality and women's participation in society (MDG 3)

- The species conservation approach, as outlined in these case studies, recognizes women as direct resource users and works to bring them into decision-making bodies such as the Natural Resource Users Committees. For example, the study found that the Forest Protected Area Buffer Zone Users' Committees in Nepal are legally required to have 33 per cent representation of local women and, today, many CFUGs are formed by women members. In Namibia, the CBNRM approach for wildlife conservation has rules to ensure that women have a voice in decision-making processes, can stand for election to committees and benefit from capacity development and training
- Before WWF's intervention in Farida village, India, girls were not permitted to attend school, particularly after completing middle school. As a result of continuous effort from the WWF project, this situation has changed and presently all girls in the village are attending school. In addition, awareness-raising campaigns in the villages have assisted in a much higher involvement of women in the official functions of the village – a role previously held by men alone.

This report, commissioned by WWF and drawing on over 40 years experience in the field of species conservation, uses case studies from around the world to demonstrate that species conservation can, and is, contributing to sustainable development as measured against the achievement of the Millennium Development Goals (MDGs). For governments, international donors and agencies, non-governmental organizations and the private sector, the report provides evidence on the role and contribution of species conservation in delivering on sustainable development and the MDGs, as well as on international commitments to reduce the rate of biodiversity loss.

The case studies include: the conservation of the tiger (Nepal), several mammal species (Namibia), mountain gorillas (Uganda), giant pandas (China), sea turtles (Costa Rica), and river dolphins (India).

Using a well recognized "development methodology" — the "Sustainable Livelihoods" (SL) framework — for analysing the case studies, the report found that the species conservation projects/programmes, implemented by WWF and partners, were delivering achievements toward at least four of the eight MDGs: namely MDGs 1, 3, 7 and 8. In addition, they contributed significantly towards enabling good governance, which is necessary for MDG delivery.

Species conservation programmes are helping to deliver environmental sustainability (MDG 7)

- The research found significant improvements in the management and conservation of natural resources in the countries where the projects are based. Over 18 per cent of Nepal is under-protected area status today. The country has a population of 123 breeding tigers and rhino figures have climbed from 100 in the 1960s to about 460 today. In Tortuguero, Costa Rica, green turtle nesting has reportedly increased by an estimated 417 per cent between 1971 and 2003. And in China, WWF has played a key role with government partners in the establishment of 33 panda reserves that provide protection of over 60 per cent of the country's giant panda populations. In Uganda, through species conservation efforts by WWF and its partners, the world's last remaining mountain gorilla populations are slowly growing. The current recorded population in the two national parks of Bwindi and Mgahinga is around 700
- Mainstreaming sustainable development into country policies and planning is emphasized by MDG 7 and is a key achievement in some of the case studies. For example, WWF and partners have played a major role in Nepal to ensure that the Terai Arc Landscape (TAL) is recognized as a national priority and included in the 10th National Development Plan 2002-2007. Among TAL's primary objectives is the sustainable development of the region. Similarly, the importance and potential of CBNRM as a rural development strategy has been recognized in Namibia and woven into the second Namibian National Development Plan.

Species conservation programmes are helping to develop a global partnership for development (MDG 8)

- The species conservation approach as outlined in the case studies meets targets under MDG 8 by working to ensure equitable trading through partnership development and addressing needs of Least Developed Countries (LDCs); for example, Nepal and Uganda. In both countries, the programme has remained operational and continued engaging with local communities through periods of political instability and violence
- In Caprivi, Namibia, successful joint venture negotiations were developed to help local conservancies procure beneficial partnerships with the private sector. The value of the joint venture of the private sector with just one conservancy, the Salambala Conservancy, was US$34,431 per annum for the period 2000-2004 whereas others earned US$64,000 per annum. In China, the panda conservation programme has been supporting a successful partnership between three nature reserves: Wanglung, Baihe and Baishuijiang, with local farmers and the supermarket Carrefour to market organic produce such as mushrooms, honey and medicinal plants. This initiative earned US$ 31,438 in its initial three months of trading.

Species conservation programmes are building on the principles of governance and partnership that support MDG delivery

Building on the principles of good governance and partnerships is recognized as being crucial to achieving the MDGs (IIED, 2004). The main elements of "good governance" are empowerment, accountability and transparency:

- The research found that the species programme is empowering local people and building local capacity. In the process, local people are being trained about the need for transparency and accountability
- Development of negotiation skills has been a key contribution from species conservation programmes. These skills have helped to resolve disputes between neighbouring villages, and between protected area authorities and locals, and have also led to investments from the private sector. The International Gorilla Conservation Programme (IGCP) in Uganda helped to develop local capacities to successfully negotiate for Multiple Use Zones in the national park that they could have access to, as well as procuring 20 per cent of the park revenue for development work
- Importantly, the study found that in conflict-afflicted zones such as in Nepal, resource governance is perhaps the only model of governance still functional in the area. WWF's species conservation programme in the TAL is continuing to support the formation and capacity building of local resource user groups that have a legal mandate under the formal government.

Recommendations

This study has demonstrated that species conservation and poverty reduction can be delivered together. The six case studies highlight that the sustainability of the MDGs depends considerably on the successful mainstreaming of biodiversity conservation into national and international development planning. Managing species and the ecosystems in which they live can improve livelihoods and incomes, empower people, and contribute to better governance. From the study, a number of recommendations can be suggested to the development and conservation sectors:

1. Recognize the contribution of the species conservation approach towards improving rural livelihoods and economies and towards achieving the MDGs
2. Appropriately support conservation approaches that emphasize development outputs
3. Ensure species are assessed and valued as a natural asset in the process of setting poverty reduction strategy papers and other similar planning and funding tools
4. Build on the linkages between development and conservation that species conservation programmes have identified and support the implementation of similar projects/programmes
5. Support the scaling up of a wide range of successful initiatives in integrating rural development with conservation
6. Support the work of the species conservation programme to contribute more to rural livelihoods in remote areas
7. Support the funding of endangered and threatened species conservation work as a key part of the development portfolio in areas of high biodiversity value
8. Develop more partnerships between development agencies/NGOs and those environmental NGOs working with communities in areas of high biodiversity value, in order to facilitate strong delivery of MDG 7.

The issues that threaten species are often the same as, or closely related to, some of the root causes of poverty. These include the marginalisation of rural communities, weak governance and political instability.

Section I: Summary Analysis

1. Introduction

The habitats of many threatened and endangered species are also home to some of the world's poorest and most vulnerable people. Whether in the Terai lowlands of Nepal, the floodplains of the Caprivi, in Namibia, or the Afromontane forests of Uganda, the issues that threaten species are often the same as, or closely related to, some of the root causes of poverty[1]. These include the marginalization of rural communities, weak governance and political instability. Sustainable environmental management that occurs hand-in-hand with development can create a real future for the world's poorest and most vulnerable people, and also halt species extinction. It is the rural poor who live in natural areas and use natural resources for their survival. To truly attain sustainable development, it is these rural people who should be the ones to conserve and manage the natural resource base. WWF has been working for over 40 years in the field with local communities, to develop and implement new ways to sustainably manage natural resources that benefit people now and in the future. Drawing on this experience, this report uses case studies from around the world, to demonstrate that species conservation can, and is, contributing to sustainable development as measured against the achievement of the Millennium Development Goals.

The continuing decline and loss of species and their habitats is a major barrier to sustainable development. Reports such as WWF's Living Planet Report 2004 and the World Resources Institute (WRI) Millennium Assessment show that that the earth's biodiversity is being plundered. Over the past few hundred years, humans have increased species extinction rate by as much as 1000 times of background rates typical over the planet's history. Some 10-30 per cent of mammal, bird and amphibian species are currently threatened with extinction (MEA, 2005). Research has shown that this can lead to further impoverishment of local, rural communities (MEA, 2005; DFID, 2000). International instruments such as the Convention on Biological Diversity (CBD) and Commission on Sustainable Development (CSD) recognize the dependency of people on biodiversity and the natural functioning of healthy ecosystems. Species conservation, which is a key component of biodiversity conservation, directly contributes to sustainable development and poverty reduction. It supports the sustainable management and use of species and natural resources by poor people dependent upon them. It also conserves the natural resource base for its potential use in alleviating poverty and contributing to development targets.

The SL framework is a tool developed by several agencies to improve understanding of the livelihoods of the poor. It enables researchers to develop a more complete picture of poor people's livelihoods and the factors, challenges and the macro level issues that affect them.

Some 10-30 per cent of mammal, bird and amphibian species are currently threatened with extinction (MEA, 2005). Research has shown that this can lead to further impoverishment of local, rural communities (MEA, 2005; DFID, 2000).

The Millennium Development Goals (MDGs) (UN, 2000) are the guiding framework for development assistance and commit the international community to halving poverty by 2015 (see Appendix 1). However, though environmental sustainability is recognized as essential to development (Goal 7), and biodiversity conservation efforts are acknowledged (EC/DFID/IUCN, 2001) for their role in meeting human needs, the reality is that biodiversity conservation and management are still marginalized in development frameworks and funding. This is particularly true for species conservation, which has suffered from the misconception that it has little to do with people and their development priorities. The reality is the converse — species conservation can and does deliver on, *inter alia*, poverty reduction and livelihood improvement.

The aim of this report is to highlight the role and contribution of species conservation programmes towards sustainable development and the MDGs, using information from six case studies that are working to conserve species and benefit local livelihoods. Based on analysis using the Sustainable Livelihoods framework, the selected six case studies show how species conservation is contributing towards achievement of at least four of the MDGs. The case studies are representative of WWF's work on species conservation globally and include: the conservation of the tiger (Nepal), several mammal species (Namibia), mountain gorilla (Uganda), giant panda (China), sea turtle (Costa Rica), and river dolphin (India)). Except for the Costa Rica case study, which is implemented by Caribbean Conservation Corporation (CCC), a partner organization of the WWF, the others are all implemented directly by WWF (working with partners in the field).

Analysis of the case studies show that:

- Sustainable resource management through local communities is succeeding in reducing species loss and environmental degradation
- Species conservation programmes can and do deliver positive impacts on local livelihoods including improvements in human, social, financial, physical and natural assets and increased diversification of rural livelihood strategies
- Species conservation efforts are ensuring access and ownership rights to natural resources, addressing local people's priorities and engaging the private sector to invest in sustainable enterprises and the rural economy
- Species conservation projects/programmes can be successful in working through participatory processes to build on the principles of empowerment and governance

- Well-planned species conservation programmes/ projects clearly demonstrate that species conservation work is ensuring sustainable development objectives, improving rural livelihoods and delivering on the MDGs.

2. Methodology

In order to examine more closely the contribution that species conservation programmes make to sustainable livelihoods in developing countries, six very different species conservation field sites were assessed to determine how these programmes are helping to deliver the MDGs. Preliminary to beginning this study, species conservation interventions and programmes of WWF and its partners were assessed from around the world to enable the selection of the six case studies. The case studies were selected to represent the programme globally and the criteria used for selection required that they should:

- Be implemented in remote, marginalized and poor, rural communities in developing countries; two are from Least Developed Countries (LDCs)[2]

- Be actively contributing to the achievement of the MDGs by improving local livelihoods

- Show sufficient information on progress through their reports, socio-economic assessments and monitoring

The assessment was conducted using the Sustainable Livelihoods (SL) framework[3] (Appendix 2). The case studies used new research and analysis, involving field visits and intensive discussions with local stakeholders and partners, along with the review of project reports and related literature. An analytical framework was developed and used for the study based on the SL framework to study the field data and assess the contribution of the selected projects to local livelihoods and sustainable development and thereby to the MDGs.

According to the Sustainable Livelihoods framework, "a livelihood comprises the capabilities, assets (including material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base".

[2]The least developed countries (LDCs) are a group of 49 countries that have been identified by the UN as "least developed" in terms of their low GDP per capita, their weak human assets and their high degree of economic vulnerability.

[3]The SL framework is a tool developed by several agencies to improve understanding of the livelihoods of the poor. It enables researchers to develop a more complete picture of poor people's livelihoods and the factors, challenges and the macro-level issues that affect them.

Poverty

[1]There are a number of approaches to defining poverty, including approaches based on monetary income, capabilities, social exclusion and participation. Poverty is usually conceptualized as an economic or social condition, with major implications for policy. Income and consumption measures are conventionally used to map poverty. A person is considered poor when his/ her personal income or consumption is below a specified 'poverty line'. Extreme poverty is defined as having to live on less than a dollar per day.

Poverty is recognized today as being multidimensional. The UN Human Development Reports take the view that poverty is broader than the lack of income – that it is a deprivation across many dimensions. From the Human Development perspective, poverty is defined as a deprivation of capabilities and opportunities essential for human development. The 1997 UN Human Development Report introduced the concept of human poverty that focuses on 'the denial of opportunities and choices most basic to human development'. This approach sees poverty not as a condition but as a process. It focuses on people's strengths and assets that they need to move out of poverty. The Sustainable Livelihoods framework provides a way of looking at how to respond to the needs of poor people from this perspective. It is being used by the UNDP and the DFID. This study has also used the framework to examine how species conservation interventions impact poverty levels.

The SL framework was selected for this study as it describes comprehensively the multi-dimensional nature of poverty and livelihoods. The framework has been used effectively by many agencies for assessments and review of projects even where these were not planned with SL concepts in mind. One case study (Terai Arc Landscape in Nepal) has actually used the SL framework to develop its programme and as such is referred to frequently in this report. The Namibian case study in this report refers to the findings of the UK Department for International Development (DFID)-funded research project, Wildlife Integration for Livelihood Diversification (WILD, 2004). WILD used the SL approach to carry out a three-year applied socio-economic research on Community Based Natural Resource Management (CBNRM) in Namibia.

Figure 1. illustrates the objectives and activities of WWF's species conservation programme that are in line with the objectives of Sustainable Livelihoods and how these then correspond to the MDGs. Whilst not exhaustive, this framework covers most of the important aspects of conservation and management of wildlife for the benefit of people. *(facing page)*

3. Species and People Linkages: Key Issues and Findings

Globally, the primary threats to species are habitat fragmentation and loss, poaching, over-exploitation, accidental killing in traps, snares and nets meant for other animals, and weak governance (resulting in ineffective implementation of policies and laws which exist to guide sustainable management of important habitats, ecosystems and species). The underlying drivers behind these threats that have been identified by root causes analyses include: poverty; the political, social and economic marginalization of the rural poor; weak governance; and political instability. Research has shown that the poor themselves are often the cause of biodiversity loss, especially if lack of income alternatives drive them to over-exploit resources (Biodiversity Brief 1, EC/DFID/IUCN). This can lead to a cycle where poverty is the root cause of the over-exploitation of natural resources. These resources are valuable assets, crucial to rural people's survival. Exhausting this resource base rather than sustainably managing it will, in future, feed further poverty. Commercial interests also tend to act for short-term economic gain, leading to unsustainable extraction of natural resources that will ultimately contribute to increasing poverty and biodiversity degradation as the resource base declines.

Conversely, the conservation and sustainable management of species and their habitats are critical for the survival of local, rural and indigenous communities in the developing world, the majority of whom are poor and marginalized. Access, use, ownership and exploitation of natural resources is inextricably linked to the livelihoods of rural peoples. Very often, these people lack basic services, infrastructure and capacity necessary to improve their livelihoods and rise above poverty. These include assets, credit schemes, technical assistance and opportunities to learn new skills. The conservation of key species and their habitats means the conservation of protected areas, forests, freshwater and marine ecosystems that provide a wide range of goods and ecosystem services, as well as livelihood options to the people living in and around them. Further, applying knowledge of the dynamics of species movement in and across habitats can provide invaluable insight into long-term sustainable land use planning. Species and habitats are valuable assets as well as an avenue of opportunity to these people to find sustainable solutions for improving their livelihood conditions.

Many conservation programmes recognize that poverty is a constraint to conservation and sustainability and must be addressed in order to deliver on conservation objectives. Root Causes Analyses (RCA), carried out by WWF, time and again have identified poverty as one of the main causes of environmental degradation. For example; in Nepal, a country torn by political conflict, poverty has been identified as a root cause of both environmental degradation and the current political insurgency (TAL Strategic Plan, 2003). These studies also pinpointed that rural livelihoods are heavily dependent on forests: the habitats of wildlife species such as the tiger, rhinoceros and elephant. Therefore, habitat conservation based on wildlife conservation planning benefited the livelihoods of the rural poor in significant ways. Sixty-nine per cent of rural households in the Terai lowlands own livestock, and most get their fodder from forests. Sixty-one per cent of households rely on wood as their main fuel for cooking. While better off households tend to use forests for production and profit, the poor rely on forests for subsistence purposes. Conservation and access to forest resources for the poor in the Terai Arc Landscape (TAL) has meant access for everyday fuel, fodder, wild foods, building materials, agricultural and household tools and medicine (Livelihoods Study, 2003).Similarly, evidence from each of the case studies analysed for this report show that species conservation, which takes into account local subsistence, economic and cultural needs, can be a powerful tool to reconcile global and local conservation priorities, and recognize the needs and voices of the poor in the developing countries. Each of the six case studies shows that species conservation projects and programmes are providing a range of opportunities to tackle poverty and improve the livelihoods of marginalized, rural, poor people. The projects and programmes are helping to improve and diversify their livelihood skills, access small credit schemes, ensure rights and access to natural resources and build negotiating skills to partner with the government and private sectors.

Figure 1. Species Conservation Objectives and Activities Corresponding to the Sustainable Livelihoods Objectives and MDGs

Millennium Development Goals (4 of the 8 MDGs)	Sustainable Livelihoods Objectives	Species Conservation objectives and activities that are designed to address root causes of environmental degradation and species loss*
Goal 1: Eradicate extreme poverty and hunger	- Increase assets (human, social, political, financial and physical) and ensure access to these - A policy and institutional environment that supports multiple livelihoods strategies and promotes equitable access to competitive markets for all - Improved access to high quality education, information, technologies and training - Better nutrition and health - Better access to basic and facilitating infrastructure	- Increase assets (human, social, political, financial and physical) and ensure access to these - A policy and institutional environment that supports sustainable natural resource management that helps to build livelihood strategies and equitable sharing - Diversify off-farm and farm livelihood strategies through capacity building and support for marketing - Improved access to resource information and communication - Supplement and improve nutrition through forest and wildlife products - Better access to basic and facilitating infrastructure - Capacity building through literacy and conservation education programmes
Goal 3: Promote gender equality and empower women	- Promote gender equality and empower women - A more supportive and cohesive social environment	- Women are empowered and fully involved in resource management and its decision- making
Goal 7: Ensure environmental sustainability	- More secure access to and sustainable management of natural resources	- More secure access to and sustainable management of natural resources
Goal 8: Develop a global partnership for development	- Partnership among donor agencies for sustainable livelihoods - Equitable trading and benefits - Continued development assistance by development agencies using SL approaches	- Ensure partnerships with development agencies and donors for sustainable livelihoods - Ensure equitable trading and benefits - Integrated development assistance to developing countries for sustainable development - Work in developing countries and LDCs

*These objectives were compiled from the objectives of the case studies (species conservation programmes/projects) included in this study.

Socio-economic research in Namibia (DFID, 2004) and in Nepal (WWF, 2003) showed that the poorest are:
- ***dependent on natural resources for subsistence survival***
- ***dependent on wildlife use for subsistence survival***
- ***vulnerable to natural disasters and vagaries in local climate and environment***
- ***impacted directly and most, by loss of access and use of resources.***

Socio-economic research (WILD Study, 2004; Livelihoods Study, 2003) has shown that the approach contributes in a number of ways to sustainable livelihoods – by offering income opportunities, access to well managed natural resources, and acting as a focal point for combining sustainable natural resource use with other aspects of economic and social development.

Socio-economic research (WILD Study, 2004; Livelihoods Study, 2003) has shown that the approach contributes in a number of ways to sustainable livelihoods – by offering income opportunities, access to well-managed natural resources, and acting as a focal point for combining sustainable natural resource use with other aspects of economic and social development. In Namibia, the government has declared the conservation of natural resources, particularly wildlife, through Community Based Natural Resource Management (CBNRM), as a national development and poverty reduction strategy. With the enabling environment provided by the Namibian government, CBNRM is now a nationwide programme. Income from the overall CBNRM programme grew from nothing to over US$1,884,058 in 2003 (NACSO, 2004).

As well as bringing economic returns, species conservation has become a vehicle for enabling governance and empowerment of marginalized, rural people by providing them with the means of taking control of natural resources and development activities in their area such as in Namibia, Uganda and Nepal (see details in Section II). Capacity building for resource management is helping to develop key skills such as leadership, organization, planning and accounting that are essential for enabling good governance in remote, marginalized areas.

4. Challenges and Limitations

WWF's species conservation work — and its Species Programme — has evolved from a largely protected areas focused approach to the ICDP (Integrated Conservation and Development Programme) model of the 1980s that stressed the role of local communities as resource managers. Today, it builds on the lessons learned from the ICDPs and emphasizes sustainable development. It recognizes that for poor people in developing countries, conservation must address their subsistence, economic and cultural needs. Species conservation initiatives have acted as the entry point for holistic and integrated interventions as necessitated by realities on the ground. Among the main challenges that species conservation has faced, and faces today, include the impoverishment of local people and their marginalization from mainstream development schemes.

Participatory rural appraisals show that the primary needs identified by local people are livelihood and development needs such as viable livelihood options and employment, safe drinking water, healthcare and infrastructure. As the case studies show, WWF and partners are working with local communities to help them find viable and sustainable solutions to improve their livelihoods and help them to negotiate for and realise development gains. However, many of these interventions are still relatively small scale. This is, admittedly, a current limitation of the species conservation programmes and projects, as they have not been planned at a sufficiently large scale to deliver broadly on development outputs. This is largely due to lack of adequate support, funding, capacity and planning.

In some situations, projects have incorporated interventions for improving local livelihoods on the ground due to overwhelming demands from the communities. Because of this, some programmes have grown in an *ad hoc* manner rather than with a planned approach. Monitoring and evaluation of development outputs have also been limited due to lack of capacity and funding. While conducting this study, there were difficulties in finding the relevant data as these had not been collected or compiled. Some programmes have been implemented or expanded fairly recently; for example, the Minshan and Qinling initiatives in China. The study, therefore, found impact indicators for livelihoods improvement were difficult to obtain for the case studies except for environmental restoration and management where many years of work have been accomplished. Where the SL framework is being integrated in the projects/programmes (Nepal case study), or where it has been used for assessment (Namibia case study), relevant information and data were readily available.

This study sheds light on the potential for addressing these challenges by showing that there exists a major opportunity for species conservation to contribute to the development targets in substantial as well as sustainable ways — if species conservation projects were to receive the required support to scale up, and if species were more effectively valued as natural assets in national development strategies.

Sixty-nine per cent of rural households in the Terai lowlands own livestock, and most get their fodder from forests. Sixty-one per cent of households rely on wood as their main fuel for cooking. The poor rely on forests for subsistence purposes. Conservation and access to forest resources for the poor in the Terai Arc Landscape meant access for everyday fuel, fodder, wild foods, building materials, agricultural and household tools and medicine (Livelihoods Study, 2003).

5. Summary Analysis of Case Studies
5.1. Contribution of the Case Studies to the MDGs

Eight MDGs were derived as a roadmap for achieving the Millennium Declaration adopted by the UN in September 2000, committing the international community to halving poverty in the world by 2015. The overarching aims of the Millennium Declaration are: "to free our fellow men, women and children from abject and dehumanizing conditions of poverty; to ensure globalisation is a positive force; to address the needs of Least Developed Countries and to continue to protect our common environment through sustainable management".

Achieving the MDGs requires very real integrated efforts to address the multi-dimensional nature of poverty, the priorities of the rural poor and their dependency on natural resources and biodiversity. The broad spectrum of poverty and livelihoods issues and the inter-linkages to environmental degradation must be addressed rather than limiting efforts to achieving just the targets and indicators identified under the MDGs. In fact, if development activities are undertaken without considering sustainability, they may potentially further degrade biological diversity, undermine the sustainability of the MDGs and hence limit any achievements. MDG's delivery and the development agenda must take into account the environmental bottom line. Species conservation practitioners and programmes are contributing to building this by integrating habitat and species conservation with development needs in real situations, as is shown in the case studies included in this report.

There has been considerable debate regarding the limitations of the MDGs in integrating biodiversity conservation across its set of goals and targets. The International Institute for Environment and Development (IIED), which launched a programme of collaborative research, networking and advocacy on the role of conservation towards achieving the MDGs, recently brought together concerned groups to stress that "environmental sustainability needs to be integrated into the MDG targets, and associated indicators should measure the extent to which changes in official development assistance and trade arrangement either support or harm the biological resource base" (IIED, 2004).

The six case studies included in this report were taken from around the world (Asia, Africa and Central America) to represent WWF's species conservation work globally, and to begin to quantify the contribution of species conservation to the MDGs. The report is based on new research and analysis using the Sustainable Livelihoods (SL) framework to assess field data and is supported by wide literature review. The selected case studies are:

1. Tiger conservation in the Terai Arc Landscape in Nepal
2. Wildlife conservation through CBNRM in Caprivi, Namibia
3. Gorilla conservation in Uganda
4. Panda conservation in Minshan and Qinling, China
5. Sea turtle conservation in Tortuguero, Costa Rica
6. River dolphin conservation in Farida village, India.

The study showed that the selected species conservation programmes/projects are delivering on the MDGs through contributions in two key areas:

(1) Species conservation is helping to conserve the natural resource base that underpins the delivery of truly sustainable development and;

(2) Species conservation is delivering development outputs by improving rural livelihoods and economies.

The positive impacts on livelihoods include improvement in human, social, financial, physical and natural assets, and increased diversification of rural livelihood strategies. Species conservation efforts are ensuring access and ownership rights to natural resources, addressing local people's priorities identified by themselves, empowering women and engaging the private sector to invest in sustainable enterprises and options to develop the rural economy. The programmes/projects clearly demonstrate that species conservation work is ensuring sustainable development objectives, improving rural livelihoods with sustainable options and delivering on the MDGs.

Based on analysis using the SL framework, the selected six case studies compiled for this report are contributing towards achieving at least four of the MDGs as the figure over page illustrates:

Figure 2. Contribution of the Case Studies to the MDGs

Case Study	MDG 1: Eradicate extreme poverty and hunger: by contributing to increased incomes and skills; by ensuring improved productive assets and stocks such as soil, water, vegetation, fish and wild food stocks	MDG 3: Gender equality: by contributing to gender empowerment in resource management and rural communities	MDG 7: Environmental sustainability	MDG 8: Partnership for development: by working towards equitable trading and returns; by engendering partnerships for development	Enabling good governance for MDGs delivery
Tiger conservation, Nepal	✓	✓	✓	✓	✓
Wildlife conservation through CBNRM, Namibia	✓	✓	✓	✓	✓
Mountain gorilla conservation, Uganda	✓		✓	✓	✓
Giant panda conservation, China	Initial stage		✓	✓	✓
Sea turtle conservation, Costa Rica	✓		✓	✓	
River dolphin conservation, India	✓	✓	✓		✓

Eradicate extreme poverty and hunger (MDG 1)

The case studies illustrate that these species conservation programmes are addressing poverty by increasing the assets of local people and enabling them to diversify their livelihood strategies in sustainable ways. The limitations of the poor that keep them entrapped in poverty are the lack of assets (such as financial and physical) and skills (such as technical, organizational, and negotiating skills) as well as the lack of opportunities (for example, credit schemes and training inputs) to increase assets and skills. The species conservation approach for addressing poverty is to ensure the conservation of productive assets and stocks such as soil, water, vegetation, fish and wild food stocks. At the same time, the approach seeks to empower local people to manage and benefit from these natural resources which are their main assets, by ensuring access and user rights and developing the necessary skills and capacity.

The SL framework identifies five core asset categories on which livelihoods are built. These are human, social, financial, physical and natural. Together with assets, it is also necessary to build livelihood strategies and activities by diversifying options, minimizing risk, coping with natural setbacks and maintaining flexibility.

Diversifying farm income

Conservation of threatened species whose key habitat areas overlap with, or are near to, poor farming communities requires interaction with these communities to discuss, develop and implement more sustainable farming and habitat management practices. This strategy helps to reduce conflict between protected areas and local people while contributing to improved livelihoods and reduced human stresses on fragile habitat areas. When rural economies are robust and local people have viable options for improving their incomes and livelihoods, they are less likely to clear more forests for farming or resort to poaching and unsustainable resource extraction. Most poor farmers in developing countries still practice a traditional, extensive form of agriculture, which results in low productivity. Lack of skills, technology, and irrigation systems are also other causes of low productivity. Added to that, the sheer lack of capital and the lack of accessibility to credit systems are major obstacles to rural people for advancing their subsistence livelihoods.

All of the six projects selected for this report – the conservation of the tiger (Nepal), several mammal species (Namibia), mountain gorillas (Uganda), giant pandas (China), sea turtles (Costa Rica) and river dolphins (India), include major programme components for building local capacities for diversifying farm and off-farm income to reduce human pressures on wildlife and their habitats. A wide range of small income opportunities are being supported in these projects that supplement household earnings and help to improve livelihoods by providing extra cash for school fees, medicine, clothing, household repairs and other necessities. Activities supported as part of a strategic species conservation programme include: raising small livestock, such as pigs, goats and poultry; beekeeping; mushroom farming; vegetable gardening; and tourism enterprises, among others.

WWF's species conservation approach seeks to empower local people to manage and benefit from these natural resources which are their main assets, by ensuring access and user rights and developing the necessary skills and capacity.

Ensuring rights and access to natural resources

Many of the poor, rural households on the case study project sites do not have legal tenure of their land or access rights to natural resources such as the forests, freshwater and marine ecosystems. Many of these local communities are locked in struggles with the authorities for land tenureship and, as a result, are considered to be illegal resource users. In order to implement species conservation programmes that will deliver sustainable habitat management, these habitats and their resources must ultimately come under the custodianship of the local community. Therefore, many species conservation projects are working to attain and strengthen access and user rights to the local people. In Namibia, the programme is helping to form and register conservancies (local resource management committees) that create a legal mandate for wildlife use for local communities. Caprivi is one of the poorest and most vulnerable regions of Namibia with the highest Human Poverty Index (HPI) in the country. Conservancies that have been registered in Caprivi have benefited local people at both collective and individual levels from the management of natural resources, particularly wildlife. Communities are earning significant incomes from wildlife tourism and limited trophy hunting.

In addition, sound conservation measures have resulted in measurably increased wildlife numbers. As a result, wildlife tourism has grown rapidly in Namibia to the advantage of rural economies. It is estimated that in 2001 the total income value added, generated from tourism in Caprivi, Kunene and Erongo regions was approximately US$16,865,672. Of this, US$1,492,537 (value added) was the income captured at the local level in the form of wages, communal income (concession fees, bed levies, etc.) and profits on community owned enterprises. (Roe et al., cited in WILD, 2003). The people in Caprivi still depend on combining strategies and resources such as cropping, livestock, piecework, wages, pensions and the use of a

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variety of natural resources including wildlife (fauna), plant and forest or river-based resources for their livelihoods. The WILD study reports that natural resource use provides a measure of security especially for the poorer households. This includes harvesting reeds and thatch grass for repair of housing and courtyards as well as sale. Other natural resources used are wild fruits, water lilies, fish, palm for craftmaking and, for some, wild animals such as duiker, wart hog, impala and spring hares provide additional food security. Effective conservation and sustainable use of these wild resources is a real way of assuring food security to people generally ignored by development schemes in remote areas like the Caprivi (WILD, 2003).

In Farida village, India, most people are poor, and the majority of the community is dependent on the subsistence farming of wheat, rice, sugarcane, vegetables and pulses. A major problem for villagers that did not own land was that the majority of government development schemes are conditional on land ownership. To tackle this hurdle, the river dolphin conservation programme brought the local administration and landless villagers together and facilitated a decision by the authorities to provide land and ownership to villagers on lease, thus increasing their access to natural resources and making them eligible for government schemes. The number of landless households decreased by 25 per cent during the project period.

Micro-finance mechanisms to seed new livelihood options

Innovative financial service mechanisms and provision of small grants to start up or support rural initiatives are also often part of species conservation programmes. Seed money is provided in Nepal to create revolving funds, which are managed by the local people themselves. Along with this, training in accounting procedures and loan management is supported. In China, financial assistance through small grants is being provided to farmers in the Minshan and Qinling mountains, where projects supported by WWF are working to conserve the giant panda. With these small grants, the farmers are able to start up or expand ventures such as raising small livestock or vegetable gardening. The capital support is helping farmers to improve their incomes and develop alternative livelihoods. The conservation gain is that farmers are less likely to turn to illegal, exploitative and unsustainable resource extraction to supplement their incomes, thereby benefiting both people and wildlife.

Building rural infrastructure

Some species conservation programmes are helping to build rural infrastructure and provide essential services. Though relatively small projects, these are identified by rural communities and provide significant support to remote areas. Small irrigation systems, subsidiary roads and trails in remote areas, health centres, schools, drinking water schemes and micro-hydro projects have been supported in many countries. While these may appear to be small projects from a development perspective, they provide significant benefits at the local level and are important to local communities. In Uganda, rather than directly supporting infrastructure, the International Gorilla Conservation Programme (IGCP), of which WWF is a partner, has helped to develop mechanisms to channel park revenues, as well as collective earnings of the community, to build infrastructure. IGCP helped to develop a revenue sharing mechanism for the local communities with the Uganda Wildlife Authority (UWA). From 2001-2003, the 20 per cent channelled back into communities from park revenues has gone to support the renovation of 12 primary schools, two health centres and a number of feeder roads, as well as other smaller projects. This infrastructure is funded through wildlife generated monies, rather than a handout from aid agencies, and is, therefore, building incentives for conservation, management, and sustainable custodianship of natural resources.

IGCP has directly supported the construction of two community campsites near the protected areas of Bwindi and Mgahinga in Uganda. The tourism revenues of these campsites are the collective income of the community. They have invested the money in infrastructure such as the construction of additional classrooms for four schools, an office for the women's group, as well as equipment and training in pineapple growing and beekeeping. A gravity drinking water scheme for the Buhoma village supported by the IGCP has built 21 water taps throughout the village. The scheme has provided water to two schools, a health centre, seven tourist campsites and about 315 households. IGCP provided partial financial assistance but, more importantly, it helped the local people to negotiate with the protected area authorities for the use of the water source located inside the park and organized them to raise funds from various sources.

Returning economic benefits to local people from wildlife tourism

Wildlife tourism has been lucrative in some places, providing much needed income and employment to local people and helping to develop infrastructure. Ecotourism, or environmentally responsible tourism that benefits local communities, is an opportunity for taking economic returns to the local people and ensuring effective resource management. WWF is helping to build local capacities for

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From 2001 to 2003, the 20 per cent channelled back to communities from the Bwindi Impenetrable National Park has gone to support the renovation of 12 primary schools, two health centres and a number of feeder roads as well as other lesser projects.

Gross revenue of sea turtle tourism in Tortuguero in 2002 alone is estimated at US$6,714,483 from board, lodging, and transportation services, as well as souvenir sales, national park and guided tour fees (Troëng & Drews, 2004).

ecotourism services in the Minshan and Qinling regions of China. Elsewhere, in Namibia, the government has long recognized the potential role that tourism can play in contributing to local economic development and poverty reduction in rural areas. The Namibian National Poverty Reduction Action Programme (2001-2005) calls for assistance to rural and disadvantaged communities to set up community-based tourism projects. In response, WWF supports community-based tourism through CBNRM in the country. Joint venture tourism lodges and camps are by far the most lucrative source of income to the conservancies. A total of US$582,332 was earned from these ventures during 2003, making up to 46 per cent of all conservancy income. Financial benefits to the conservancies and local communities involved included direct revenue sharing, concession fees paid annually, a monthly lease fee, and levies for every bed night sold by the lodge and employment. The joint ventures have provided 199 full time and 46 part time jobs for members of the conservancies involved (NACSO, 2004).

Tourism to the Tortuguero National Park in Costa Rica increased from 226 visitors in 1980 to 80,319 visitors in 2004. The tourists come mainly to observe fauna and flora and to watch nesting green turtles at night. In 1990, almost 90 per cent of tourists stated that they visited Tortuguero to observe plant and animal species, especially sea turtles (Lee & Snepenger, 1992). Gross revenue of sea turtle tourism in Tortuguero in 2002 alone is estimated at US$6,714,483 from board, lodging, and transportation services, as well as souvenir sales, national park and guided tour fees (Troëng & Drews, 2004). The number of jobs generated by tourism in Tortuguero village is estimated to be 359 (68 per cent of the total population). Funds from tourism have supported the construction of a playground, housing for school teachers, a police station, a sports court, a kindergarten, a day care centre, as well as pipes for the public water system, a fence for the garbage treatment facilities, and the maintenance of school buildings.

Promote gender equality and women (MDG 3)

Empowerment of communities to provide effective and sustainable custodianship of natural resources is critical to successful species conservation, and to successful development. The species conservation programmes cited in the case studies are empowering local people, both men and women, to become effective resource managers of wildlife and its habitat, which provide multiple opportunities for consumptive and non-consumptive uses. Many studies have shown that women, who make up about half the rural populations, are direct users of resources but are marginalized from resource management decisions. Through a focused approach that includes training, awareness and capacity building, species conservation programmes are empowering women to become fully involved in resource management and its decision-making.

Transforming gender relations by empowering women in resource management

Development indicators are very low for women in the Terai Arc Landscape in Nepal. Only 40 per cent of women are literate, compared to 60 per cent of men. Despite the easier access than in the hills and mountains, access to resources and services are also very low. Nineteen per cent of households in seven TAL districts are more than an hour's walk from a water source (NPC *et al*., 2001-3). Women and children are usually the ones allocated the tasks of collecting water and fuelwood. A World Bank survey found little evidence of change in social structure such as gender relations over the last 20 years in the Terai lowlands in Nepal. Rather, there was evidence that the status of women had declined in the Terai, and that dowries were becoming more common (World Bank, 1999). To redress this, the Terai Arc Landscape project for the conservation of tiger habitat recognizes women as direct resource users and works with government and local people to bring them into decision-making bodies such as the Forest Users Committees. Largely through such efforts, the Buffer Zone Users' Committees are legally required to have 33 per cent representation of local women. There are now a number of Resource Users Committees whose members are entirely women in the Terai.

In a similar manner, special emphasis is given on building gender equity into Community Based Natural Resource Management (CBNRM) for wildlife conservation in Namibia. The programme works to ensure that women have a voice in decision-making processes, stand for election to committees, and benefit from capacity development and training. These efforts are helping to transform gender relations in the rural societies where the projects are implemented. Empowering women in resource management is proving effective in building confidence and leadership qualities and helping women to take on greater roles in rural development.

In Farida village, India, prior to intervention through the

Development indicators are very low for women in the Terai Arc Landscape in Nepal. Only 40 per cent of women are literate, compared to 60 per cent of men. A survey found that the status of women had declined and that dowries were becoming more common (World Bank, 1999). The programme works to ensure that women have a voice in decision-making processes, stand for election to committees, and benefit from capacity development and training.

river dolphin conservation programme, girls were not permitted to attend school, particularly after completing middle school. As a result of continuous effort from the programme, this situation has changed and presently all girls in the village are attending school. Additionally, places have been reserved for women representatives from the village to attend further higher education. Previously, the husbands of the elected women would perform most of the official functions and the elected female representative would only present themselves for the signing of documents. This was the standard practice in several villages that had elected women representatives. WWF organized campaigns to make the villagers aware of this issue and to build confidence in the husbands of the female representatives. As a result, the women representatives now directly handle all official functions. The contribution of the project towards the empowerment of women in the village has helped secure the confidence and cooperation of the villagers, as well as contributing to a transformation of women's roles in the village.

Ensure environmental sustainability (MDG 7)

Species conservation has played a crucial role in integrating the principles of sustainable development into Nepal's country policies and plans. The Terai Arc Landscape concept was developed from tiger dispersal modelling. Effective and sustainable forest management practices through local communities are restoring forest corridors that connect protected areas. These corridors are essential for the dispersal and long-term survival of the tiger and other species. Species conservation efforts urging landscape conservation have been instrumental in ensuring that sustainable development and biodiversity conservation of the TAL is recognized as a national priority and included in the 10th National Development Plan 2002-2007. The TAL conservation programme is also in line with the Sustainable Development Agenda for Nepal (2002-2017) and the Nepal Biodiversity Strategy.

Similarly, the importance and potential of CBNRM as a rural development strategy has been recognized in Namibia and woven into the second Namibian National Development Plan. WWF's species conservation work is successfully using the CBNRM approach for integrating wildlife conservation with rural development objectives in Caprivi, where reports say "in key areas wildlife numbers are increasing and in some cases wildlife is returning to areas from which it had disappeared, as the attitudes of people become more positive" (IRDNC's Mid Term Evaluation, 2003). Wildlife tourism is growing and local people are benefiting financially as well as through resource use in Caprivi, one of the poorest regions of Namibia.

Maintaining the resource base in areas of political instability and conflict

In Uganda, through WWF and partners' species conservation efforts, the world's last remaining mountain gorilla populations are slowly increasing. In the Bwindi Impenetrable National Park (BINP), the census taken in 2002 recorded 320 gorillas, 20 more than the last census taken five years ago. In the Mgahinga Gorilla National Park (MGNP) and its bordering parks in Rwanda and Congo, a gorilla census had not been taken since 1989. The recent census carried out in 2004 recorded 382 gorillas in that group of parks, an increase of 17 per cent. This is remarkable considering the political instability, civil war and genocide that occurred in the area. At the same time, community appraisals show that the numbers of other wildlife are also increasing. Degradation of the environment has stopped and signs of regeneration are visible in some patches (A McNeilage pers. comm.).

Simple technologies to ensure sustainable solutions

Besides plantation and restoration actions to recover forest habitats, the use of simple, efficient technologies are of critical importance to ensure sustainable conservation and livelihoods in the rural areas of developing countries. Biogas reactors and energy efficient stoves are simple technologies that are highly effective and affordable. They have multiple uses that are environmentally friendly and advantageous to the rural populace. Biogas reactors produce less smoke and enough fuel gas to cook meals. Depending on the size of the plant, energy produced can be used for lighting purposes and a useful by-product is organic fertilizer. Species conservation programmes place a large emphasis on promoting the use of biogas reactors and fuelwood efficient stoves through technology transfer supported by grants and credit schemes. In the past two years, around 300 biogas reactors and over 500 efficient stoves have been installed in the Minshan and Qinling mountains of China. In China, it is reported that traditional stoves use 60-100 cubic metres of fuelwood in a year whereas the efficient stove saves up to 30 per cent of this amount. In Nepal, over 1778 biogas reactors and 6127 efficient stoves have already been built in the TAL.

Developing a global partnership for development (MDG 8)

MDG 8 specifies that it is about developing an open trading and financial system that includes a commitment to good governance, development, and poverty reduction, addressing the least developed countries' special needs, and cooperating with the private sector to make available the benefits of new technologies; especially information

Through the programme, a framework for joint venture negotiations was developed in Caprivi to help conservancies procure beneficial partnerships with the private sector. The value of the joint venture between private entrepreneurs with Salambala conservancy was US$34,431 per annum for the period 2000 - 2004 and for another consortium of conservancies, it was US$64,000 per annum for the period 2003 - 2004.

and communications technologies. Species conservation projects demonstrate real efforts and achievements in these areas.

Developing partnerships

Wildlife conservation through CBNRM in Namibia illustrates how conservation contributes to good governance and poverty reduction, and to developing partnerships with the private sector. Through the programme, a framework for joint venture negotiations was developed in Caprivi to help conservancies procure beneficial partnerships with the private sector. Two joint ventures based on trophy hunting have been successfully negotiated and managed efficiently by conservancies. Salambala Conservancy and a consortium of Kwando/Mayuni/Mashi and Wupara Conservancies entered into these ventures. The value of the joint venture with Salambala was US$34,431 per annum for the period 2000-2004, and for the consortium of conservancies, it was US$64,000 per annum for the period 2003-2004. Each individual conservancy decided for themselves the method of distribution of their income. At times, they were distributed directly to households, which helped to pay the school fees of children and other household expenses.

Similarly, exploring innovative partnerships with the private sector and local communities in order to deliver and showcase sustainable models of rural economic growth is one of the main objectives of panda conservation projects in the Minshan and Qinling mountains of China. A successful initiative of these projects has been facilitating the partnership of the three nature reserves of Wanglung, Baihe and Baishuijiang with local farmers and a private entrepreneur to successfully market organic produce such as mushrooms, honey and medicinal plants to the supermarket Carrefour. The initiative earned US$31,438 in the first three months and demonstrates possibilities of sustainable models for rural economic growth.

Working in 'Least Developed Countries'

Species conservation programmes are also working in Least Developed Countries[5] (LDCs) like Uganda and Nepal. Addressing their special needs has meant working during extended periods of political conflict, helping to enable governance and deliver on conservation and livelihoods needs. In both countries, the species conservation projects have stayed operational through long years of political conflict in regions where violence was particularly severe and the lives of the staff working in the field were in danger.

[5]The Least Developed Countries (LDCs) are a group of 49 countries that have been identified by the UN as "least developed" in terms of their low GDP per capita, their weak human assets, and their high degree of economic vulnerability.

5.2. Building on the Principles of Governance and Partnership that Support MDGs

Building on the principles of good governance and partnerships is recognized as being crucial to achieving the MDGs (IIED, 2004). The main elements of "good governance" are empowerment, accountability and transparency. Enabling local people to efficiently and sustainably manage their natural resources empowers them to take control of their resources and the livelihood strategies based on them. Capacity building of the rural, marginalized communities for resource management develops governance skills such as leadership, management, planning and accounting. These are all key strategies that species conservation builds upon.

The participatory processes used as part of an integrated species conservation programme are helping impart knowledge to rural communities about the need for transparency and accountability. Development of negotiation skills has helped resolve disputes between neighbouring villages, between protected area authorities and locals, and led to investments from the private sector for business ventures. The IGCP in Uganda has been instrumental in empowering locals to negotiate for the reform of the Ugandan Wildlife Authority's protectionist policy from one that excluded locals to a more participatory one. Today, Bwindi Impenetrable National Park, home to mountain gorillas, employs a warden and a number of rangers specifically to work with the neighbouring villages on developing sustainable use and revenue sharing options. IGCP helped to develop local capacities to successfully negotiate for Multiple Use Zones in the national park that local people could have access to for traditional livelihood activities such as beekeeping and the collection of weaving materials and medicinal plants. Similar negotiations also led the park to share 20 per cent of its income through park fees for development work in the local area.

The case studies from Namibia and Nepal show that enabling local people to become effective resource managers delivers better governance results:

1. Community decision-making processes are strengthened
2. Resource user groups are enabling communities to have access to and increased ability to control land and resource use
3. Resource management is providing empowerment mechanisms that enable rural people to be informed and capable so as to negotiate with government and the private sector to improve their livelihood options

IGCP helped to develop local capacities to negotiate for Multiple Use Zones in the national park. Similar negotiations also led the park to share 20 per cent of its income through park fees for development work in the local area.

4. Community leaders are being held accountable for their actions
5. There is increased participation of women in decision-making processes.

Moreover, in conflict-torn regions, resource governance through local communities may be the only model of governance functional in the area. In most rural parts of the Terai lowlands of Nepal that have been affected by the Maoist insurgency, the government (including the administration and police) are not physically present, having been attacked and driven away, or killed. Maintaining a low profile and using the knowledge of more than two decades of experience of working with local communities in the Terai, WWF's species conservation programme works to support the formation and capacity building of local resource user groups that have a legal mandate under the formal government. These user groups are reported to be carrying on their resource management responsibilities in the heavily conflict-affected region. WWF supports them to prepare operational plans based on sustainable management guidelines that they use to harvest and sell timber, plant new saplings, protect natural regeneration and extract grass, and gather fuelwood and other forest products. Training in information management and communications has helped them to coordinate with each other and form networking bodies (WWF Nepal Programme pers. comm.). This indicates that capacity building for community resource management can provide a means for governance and community development in conflict-afflicted regions.

6. Conclusions and Recommendations

The MDGs and the associated poverty reduction agenda are key strategic tools which are important in bringing about a truly linked approach to sustainable development which meets the needs of people while appropriately valuing, conserving, and managing biodiversity. This study emphasizes that the achievement of the MDGs and their sustainability depend considerably on the successful mainstreaming of biodiversity conservation into national and international development planning and aid agendas – and specifically on the contribution species conservation can make to this process.

The principles of "sustainable use" and "benefit sharing" embodied in the MDGs and the CBD are mutually supportive, but the challenge lies in the implementation; particularly in effectively using the inter-linkages between biodiversity and people for the benefit of both. Species conservation work carried out across the globe, and the lessons learned over many years, has much to offer in understanding the links between environment and development. The case studies included in this report illustrate where these links have been identified and used to implement effective programmes. This study shows that, increasingly, species conservation projects around the world are demonstrating visible results; that they are helping to achieve the MDGs by conserving the natural resource base that underpins sustainable development and, in addition, contributing to the improvement of rural livelihoods and economies in sustainable ways.

In order to maximize the delivery of the MDGs — and to halt the loss of biodiversity — governments, donors, non-governmental organizations and the private sector are recommended to:

1. Recognize the contribution of the species conservation approach towards rural livelihoods and economies and in so doing, recognize the validity of species conservation work and its contribution to achieving the MDGs

2. Adjust current financing mechanisms to factor in environmental risks and opportunities and therefore appropriately support conservation approaches that emphasize development outputs

3. Ensure species are assessed and valued as a natural asset in the process of setting poverty reduction strategies papers and other similar planning and funding tools

4. Recognize the linkages between development and conservation that species conservation programmes have identified and used to achieve integrated results, and promote/support the new and/or continued implementation of, and support for, similar projects/programmes

5. Support the scaling up of a wide range of successful initiatives in integrating rural development to conservation, such as community resource management, building innovative partnerships that bring private investments into rural areas, and addressing the special needs of conflict-affected areas in Least Developed Countries

6. Support the contribution of species conservation programmes to rural livelihoods in remote areas by helping to further develop systemic and people-centred approaches that build on poor people's priorities, and effectively engage all stakeholders and address the underlying socio-economic, policy, and institutional drivers

7. Support the funding of endangered and threatened species conservation work as a key part of the development portfolio in areas of high biodiversity value

8. Develop partnerships with environmental NGOs in areas of high biodiversity value in order to facilitate strong delivery of MDG 7.

Case Study One:
Integrating sustainable livelihoods with tiger conservation in the Terai Arc Landscape, Nepal.

Case Study 1

The Terai Arc Landscape in Nepal is populated by 6.7 million people. 60 per cent of households own less than 1 hectare of land. The average annual income for a person is US$100. 61 per cent of households rely on wood as their main fuel for cooking. Most get their fodder from forests.

Abstract

The evolution of WWF's global species conservation approach in the past four decades is epitomized in the development of its tiger conservation programme in Nepal. When WWF began working for wildlife conservation in the country in 1967, the emphasis was on species conservation and research. By the 1980s, to deal with human issues that were intricately linked to attaining conservation goals, it adopted the Integrated Conservation and Development Programme (ICDP) approach and focused on enabling local people to become resource managers, beneficiaries and stewards. An ecoregion-based conservation approach has now taken it beyond the limited boundaries of protected areas and the site-based initiatives of the ICDPs. WWF is today integrating the Sustainable Livelihoods framework into its species conservation approach in Nepal, in order to address the multiple stakeholders and multi-dimensional nature of tiger habitat conservation, at the ecoregion scale, in the Terai Arc Landscape.

1. The Context

The Terai Arc Landscape (TAL) in Nepal is important to the country for economic reasons, as well as for its biodiversity and ecological services. The TAL extends from Nepal to India, covering a 49,500 square kilometre network of 11 protected areas and forest corridors. The Nepalese portion of the TAL, which this case study is based on, extends over 14 districts encompassing a total of 23,199sq km. It includes over 75 per cent of the remaining forests of the Terai (Nepalese lowlands), which satisfy national and local demand for timber and non-timber resources. The Churia hills that run along its length from east to west are important watersheds for maintaining the high productivity of the Terai — one of the main sources of national economic growth.

The TAL is a conservation priority in His Majesty's Government of Nepal's (HMG/N) 10th Plan for National Development. The highly productive alluvial grasslands and subtropical forests support some of the highest densities in the world of the Royal Bengal tiger (*Panthera tigris*), and the second largest population of the Greater one-horned rhinoceros (*Rhinoceros unicornis*). In 2001, a biological assessment confirmed that this area supports over 85 species of mammals, 550 species of birds, 47 species of reptiles and amphibians and over 125 species of fishes. However, the current deforestation rate in the Terai is estimated to be in the region of 1.3 per cent per annum (about 8,300 hectares). Poaching of wildlife and illegal timber extraction exacerbated in recent years as a result of political instability.

Reforms in 1990 established a multi-party democracy within the framework of a constitutional monarchy in Nepal. But the country did not gain political stability and the situation has deteriorated over the past four years, with the country experiencing major political upheavals, insecurity and violent conflict. An insurgency mounted by Maoist rebel forces is now widespread. Negotiations between the government and Maoist insurgents have ended inconclusively twice. Conflict and violence continue to occur in various parts of the country, including the TAL. The performance of the state has been severely affected – in governance, service delivery, and the maintenance of law and order. In many rural parts of the TAL, the government administrative bodies and the police are not physically present, having been attacked and driven away, or killed.

The Terai Arc Landscape in Nepal is populated by 6.7 million people, the majority of whom are poor farmers, with 60 per cent of households owning less than a hectare of land. The average annual income for a person in the TAL is US$100. These rural households depend heavily on natural resources. Sixty per cent rely on agriculture for their main source of income, while 69 per cent of households own livestock, and most get their fodder from forests. Sixty-one per cent of households rely on wood as their main fuel for cooking. The population of the TAL in Nepal has grown by 81 per cent in the past 20 years. The current average annual population growth rate in the TAL districts is 3 per cent. (Livelihoods Study, 2003). Migration is a leading cause of population growth, with the majority of migrants coming from the adjoining hill districts.

With the majority of households owning very little land, the poor are forced to rely on subsistence agriculture and raising small livestock, supplemented with earnings from wage labour where it is available. The existence of accessible forest resources enables the poor to generate income from livestock-raising, one of the few cash-earning opportunities open to them. While productivity in irrigated land is fairly high, the majority of TAL households do not have access to irrigation, and hence are only able to produce one crop per annum. Only 12 per cent of TAL land is irrigated (MoAC, 2000). Off-farm livelihood opportunities are gradually becoming available, but are still very limited, especially for poor households who lack skills and capital. Seasonal migration to urban areas and India for wage labour is an important source of income for most of the TAL's rural communities. More local options, such as agricultural labour, rickshaw pulling, fuelwood sale and stone crushing, tend to be at subsistence level and offer little opportunity for the poor to better their lives. A woman can earn as little as US$0.5 for a day's agricultural labour (Livelihoods Study, 2003).

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People in the TAL are exposed to a number of factors that make them vulnerable, such as environmental degradation, natural disasters and the insurgency. Floods and landslides caused an estimated US$600,000 of economic damage in TAL districts in 2001 (DWIDP, 2001). The poor are the most vulnerable to all of these factors, because they have few resources to help them when they are affected, and because they tend to live on the least desirable land, where disasters are most likely to happen (e.g. river banks). The insurgency and political instability of recent years has had a major impact on livelihoods, especially in the mid — and far-west zones. The poor have borne the brunt of the impact, in terms of vulnerability to violence, increased food insecurity, reduced livelihood opportunities, and increased out-migration of able-bodied household members. The widespread poverty and lack of opportunities is recognized as one of the root causes of the insurgency (TAL Strategic Plan, 2003).

2. Links between Livelihoods and Wildlife

In Nepal, species conservation initiatives by WWF have been the entry point for holistic and integrated interventions geared towards attaining both biodiversity conservation and sustainable livelihoods for local people. WWF began working in Nepal in the 1960s with a very species-focused approach directed on research (starting with tiger and rhino monitoring and research), poaching control and human-wildlife conflict mitigation. By the 1980s, this approach had evolved into an Integrated Conservation and Development Programme (ICDP) in response to human issues in this densely populated and poor region. In recent years, species conservation work has built on the lessons learned from the ICDPs and has focused on identifying links between livelihoods and species conservation to strengthen planning and gain better results. In Nepal today, WWF is integrating the Sustainable Livelihoods framework into its species conservation approach in the TAL, in order to address the multi-stakeholder and multi-level issues of tiger habitat conservation at the ecoregion scale.

As part of the TAL Strategy Planning process in 2002-3, the Ministry of Forests and Soil Conservation (MFSC), with WWF's support, carried out a root causes analysis (RCA) through participatory multi-stakeholder consultations that identified key links between socio-economic forces and environmental degradation. The major link identified was the vital need of forests for both people and wildlife. The Terai forests are the habitat of species such as the tiger, rhinoceros and elephant. The sustainable management of the forests in the landscape not only benefits the wildlife, but also the rural people of the Terai. Livelihoods and forests are inextricably linked in the TAL, in ways that vary between socio-economic groups. Better off households tend to use forests for production and profit. The poor, on the other hand, rely on forests for subsistence purposes, as they have few other resources to survive on. The poor use forest resources for fuel, fodder, housing, agricultural tools, household implements and medicine. Forest foods are an important supplement in times of hardship (Livelihoods Study, 2003).

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The Churia forests in the TAL maintain the hydrological cycle and ensure water supply to the fertile lands of the Terai, often called the "rice bowl" of the country. Forest conservation provides essential ecological services — maintaining biodiversity, soil conservation and carbon sequestration. Species conservation work is supporting the restoration of Terai forests through different community forest management modes such as Community Forestry, and Leasehold Forestry. Local communities are supported to form legally mandated User Groups who are assigned clear-cut rights and responsibilities for the management of such forests. All the benefits accrued are collected by local members — ranging from income and employment to extractive uses for fuelwood, fodder, timber and non-timber forest products (NTFPs).

The direct benefits of wildlife conservation to livelihoods were recognized in Nepal with the growth of the tourism industry. WWF has pioneered nature-based tourism through innovative community management models and helped to develop tourism revenue-sharing of protected areas with bordering buffer zone communities. These initiatives have provided local communities bordering protected areas with substantial financial and employment benefits. For example, buffer zone management around the Royal Chitwan National Park (RNCP) has delivered significant financial benefits to the local people from wildlife tourism. Since it was registered in 1996, Baghmara Community Forest User Group, in the buffer zone of the RCNP, has earned US$175,000 from tourism activities such as wildlife viewing on elephant back, canoe trips, bird watching and entry fees. Unfortunately, tourism has taken a setback during the recent years of political turmoil, but it is expected to grow again with the return of peace in Nepal, as the country has exceedingly diverse and unique nature-based tourism attractions and activities to offer.

It is important to recognize that along with benefits exist conflicts. The major conflict is between humans and wildlife when their territories overlap. As forest cover and quality improves with successful conservation measures, wildlife numbers are expected to increase. In fact, field reports already indicate greater movement and observation of wildlife in some areas (WWF Field Reports, 2004). It is crucial

Since it was registered in 1996, Baghmara Community Forest User Group, in the buffer zone of the RCNP, has earned US$175,000 from tourism activities such as wildlife viewing on elephant back, canoe trips, bird watching and entry fees.

that the TAL Programme should develop strong mitigation measures early. WWF and other partners have a great deal of experience globally when dealing with this conflict issue in communities which neighbour protected areas. The TAL Programme is using this experience to develop effective measures at the landscape scale. Activities on the ground include growing alternative cash crops such as mentha that are not eaten by wildlife, and support for the construction of watchtowers, fences and trenches to keep wildlife out of residential camps and villages.

"According to a group discussion with mentha farmers, there was significant crop and livestock depredation around the Royal Bardia National Park. They used to lose one of their major crops — maize — to elephants, rhinos, wild boars and blue bulls. People kept watch all night during the harvesting season in May-June. During these grass deficient months, the frequency of wild animals' depredation was higher compared to other months. With support from the TAL Programme, farmers started to farm mentha. Four distillation plants for menthe oil were established, and market linkages developed. Most of the mentha farmers expressed their satisfaction with being able to diversify their income to meet household needs. As mentha oil is highly marketable and providing incomes, the farmers are able to recover from crop depredation shocks. Some of them have reinvested the earnings in other ventures such as cash vegetable gardening, raising poultry, running flour mills and retail shops." In 2004, 75 farmers earned US$5600 from the sale of 750kgs of mentha oil (WWF Field Visit Report, 2005).

3. Initiatives and Results

3.1. Building Livelihood Assets

The Sustainable Livelihoods framework identifies five core asset categories on which livelihoods are built. These are: human, social, financial, physical, and natural. Composite development indicators show that inequality in terms of capacity, income, resource distribution and access to services is more severe in the TAL than in the rest of Nepal. Agriculture is the major livelihood for 60 per cent of households but most do not grow enough to feed themselves through the year. Forty-six per cent of subsistence farming households in Basanta, Kailali district, reported that agriculture provided food sufficiency for less than six months (Mountain Spirit, 2003). Though major advances have been made in education and health, development indicators are still very low for the Terai, especially for women. Only 40 per cent of women are literate, compared to 60 per cent of men. Despite easier access than in the hills and mountains, access to resources and services are also very low: 19 per cent of households in seven TAL districts are more than an hour's walk away from a water source (NPC, 2001-3).

Strengthening human and social assets

Species conservation programmes are helping to build the human capital of the landscape through the capacity building of the people for farm and off-farm diversification, and for resource management, entrepreneurship, gender mainstreaming and leadership skills. Training, equipment and support structures, such as small credit schemes and marketing, are being assisted. Through awareness and training, women are being encouraged to fully participate in resource management and decision-making. There are now resource user groups whose members are entirely women. To encourage the education of girls, a stipend programme has been established with the help of a private donor that provides stipends to 240 female students.

A strong environmental education component of the species programme is developing communication and networking skills, and strengthening knowledge about natural resources. A community radio programme and a quarterly newsletter, "Kael Pahura," in the indigenous Tharu language have been supported, and local schools were assisted to form 98 Eco Clubs. In 2004, Non Formal Education classes were held for 158 deprived children, goat herders and adults. The participatory processes that are central to the species conservation approach are teaching valuable lessons about the need for transparency and accountability. Strengthening community forest management has led to the strengthening of community support systems. For example, when the Baghmara CFUG started to generate revenue, it began to use its income to finance biogas plant installation for its members — the majority of whom are local farmers. The CFUG provides US$34 to each member for a biogas plant installation. It is also operating a small credit scheme targeted at poor households and provides up to US$70 at a low interest rate that can be paid back in instalments (WWF Nepal pers. comm.).

Supporting basic infrastructure and equipment

Over 60 per cent of TAL households rely on fuelwood for cooking. The average household collects its fuelwood directly from the forest, an activity carried out mainly by women and children. In order to address the human issues as well as the problem of unsustainable resource extraction, species conservation work began assisting people to install fuelwood-efficient stoves and biogas reactors. To date, over 6127 households have had efficient stoves installed by locally trained technicians. In a period of four years, from 2001-2004, the programme proceeded to support the construction of 1778 biogas reactors and over 650 toilets that are attached to the reactors. Since 2004, this has been carried out in partnership with the NGO — Biogas Support Programme of Nepal. Local electrification efforts were also supported through the construction of three micro-hydro

"It was when our men failed to realize the importance of conservation and community work that we took the lead… I talked to people from the TAL and they helped us to build this watchtower… A large group of us keep watch from here and chase the animals when they come. Less of our crops are being damaged these days." Local dalit woman, Kamala Saud, 34.

power plants (of 2.5, 5 and 10 kilowatts capacities). The results of this investment by the species conservation programme are clear — huge savings in labour and time enable women and children to pursue other livelihood related activities or an education. Pressures on wildlife habitat are reduced and the participation of the local people for conservation efforts is facilitated. The improved stoves and use of biogas and toilets also lead to a cleaner environment and better health.

In practice, 35 kilograms of fresh dung (the average daily production of two buffaloes or cows) produces enough gas for three hours of biogas stove use — enough to satisfy the cooking energy needs of a family. Per household, the workload (of mainly women and girls) is reduced by about three hours per day, saving time otherwise spent on firewood collection, chopping wood and cleaning pots. Female members of households, after starting to cook with biogas, report significant health improvements, particularly regarding respiratory, gastrointestinal and eye diseases. It is estimated that each reactor saves about 3000kg of firewood and 40 litres of kerosene annually. Each reactor contributes to the reduction of greenhouse gases to the extent of approximately 4.6 tons/year CO2 equivalent. The biogas reactor saves large amounts of agriculture residue and dried dung cakes from being burned, and produces quality organic fertilizer for the farm (BSP Fact Sheet, 2003).

Species conservation programmes have also invested in the construction of infrastructure for improving services such as education, health, irrigation and transport. Although relatively small projects, they were identified by local communities and provide significant support. Eight schools were assisted with renovations and improvements to their buildings and toilets. Subsidiary roads and small irrigation schemes prioritized by local people were also supported, along with two health care centres. Additionally, the programme provides equipment and building materials to start up or expand a variety of activities such as raising small livestock, vegetable gardening, fish farming and tailoring, among others.

Ownership, access rights, diversification and cash benefits lead to stronger financial assets

Species conservation programmes endeavour to connect protected areas with forest corridors, managed by local people through legally-mandated forest management modes developed within the country, such as Community Forestry, Leasehold Forestry and Buffer Zone Management. Expanding the coverage of community-led forest management through the formation and capacity building of User Groups (UGs) has enabled local communities to gain tenureship, user rights and access to forest resources (fuelwood, timber and NTFPs). When registered, the UGs have access and user rights to varying degrees, the highest being that of the Community Forest User Group (CFUGs), which capture all the benefits accrued from the forest products — financial and otherwise. Leasehold Forestry is specially targeted at the poorest groups, providing economic opportunities while achieving productive forest rehabilitation through, for example, agro-forestry. Buffer Zone Management is carried out through Buffer Zone User Groups in degraded forests surrounding protected areas. Forest restoration activities carried out by the User Groups include seedling production, plantation and natural regeneration under sustainable management regimes.

CFUGs in the TAL have made considerable profits, which they have channelled back into the communities by funding development projects for schools, roads, bridges and irrigation schemes, and by providing soft loans. Calculations based on CFUG income and the value of forest products used indicate that income can be in the region of US$34/ha/year. The average forest area under Community Forest management in the Terai is 140ha. Therefore, on average, a CFUG can earn US$4760 per annum (Kanel et al., 2003). While it is true that issues of equitability and corruption need to be addressed in these management modes, Nepal's Community Forestry has been recognized internationally as a successful programme that delivers resource use rights to the people. In the past four years, through WWF support, 44 CFUGs were formed and registered. Altogether, 92 CFUGs benefited from training and study tours. In the last two fiscal years, WWF supported the handing over of 4271ha of forests to User Groups.

Conserving natural capital

Over the past three decades, the natural habitat of the Terai Arc landscape has become highly fragmented. The current deforestation rate in the Terai is estimated to be in the region of 1.3 per cent per annum (about 8,300ha). Poaching of wildlife and illegal timber extraction escalated in recent years, due to political instability. However, looking back at the situation in the 1960s, it is evident that the country has made huge strides in conservation, with WWF's close support and collaboration. Species conservation efforts have been instrumental in ensuring that the TAL was identified as a conservation priority in HMG/N's 10th Plan (2002-2007) for National Development, thus significantly mainstreaming conservation into development planning. With a similar aim, the TAL Programme has also been aligned with Nepal's Sustainable Development Plan and the Nepal Biodiversity Strategy.

Nepal is signatory to a number of international environmental conventions, including the CBD and CITES. Species conservation work has assisted the country to deliver on its international commitments. Today, over 18 per cent of the country is under protected area status. Today, the country has a population of 123 breeding tigers. In the 1960s, the rhino population had declined to a mere 100, from nearly 800 a decade earlier. It has grown back

Community Forest User Groups return benefits to all its members, ranging from income and employment to extractive uses for fuelwood, fodder, timber and non-timber forest products. Average income from the Community Forest is reported to be about US$4760 per annum.

steadily since then. In 2005, a rhino census in the RCNP recorded 372 individuals. Through a highly successful translocation programme, 87 rhinos were moved to two other parks in the country where they are reported to be adapting well, and some calves have been born. In total, there are about 460 rhinos in the country today (WWF Nepal pers. comm.). Sadly, rhino conservation is again being threatened by political instability. The deteriorating law and order in the country has resulted in increased poaching – 30 rhinos were reportedly killed in the RNCP between 2002-2003 (TAL Progress Report, 2003).

3.2. Building Livelihood Strategies

Agriculture and livestock raising are the major livelihood strategies across the TAL. With the majority of households owning very little land, the poor are forced to rely on subsistence agriculture and raising small livestock, supplemented with earnings from wage labour where it is available. The poor report the lack of sufficient land, insecure tenureship and low productivity as major obstacles (Participatory Livelihoods Assessment, 2003). Most poor farmers still practice a traditional, extensive form of agriculture, which results in low productivity. While productivity in irrigated land is fairly high, the majority of TAL households do not have access to irrigation, and hence are only able to produce one crop per annum. Only 12 per cent of TAL land is irrigated (MoAC, 2000). Productivity is further limited in areas where farmers do not have access to forest resources, and are forced to burn dung as fuel rather than using it to fertilize their fields. Eleven per cent of TAL households rely on dung as their primary source of cooking fuel (Livelihoods Study, 2003).

The majority of livestock owners use forests to sustain their livestock, either through free grazing, or fodder collection. The existence of accessible and available forest resources from well-managed forests, therefore, enables the poor to generate income. The integrated approach adopted by the species conservation programme is illustrated by its major emphasis on helping rural people to diversify their livelihood strategies. This includes improving forest management through local communities, and supporting poor farmers in raising livestock such as pigs, goats and buffalos. The programme helps to form small farmers groups and provides soft loans or livestock, which they are required to return to the group. Eventually, the groups use their savings to buy seeds, equipment or assist other farm enterprises. The programme also helps to improve breeds and veterinarian services.

Off-farm livelihoods opportunities are gradually becoming available in the area, but are still very limited, especially for poor households who lack skills and capital. Species projects are working to develop alternate income-generating schemes that will significantly improve livelihoods. Alternate opportunities to illegal resource extraction, such as illegal fuelwood collection and sale, will at the same time reduce pressure on forests. Agro-forestry is a significant opportunity to the people who can grow non-timber forest products (NTFPs) in their community or leasehold forests. The integrated programme has distributed 70,854 fruit tree saplings (such as mango, litchi and jamun) and 60,973 NTFP saplings in three years. These include rattan and bamboo, which can be sold or used to make furniture. Training workshops and study tours have been conducted to ensure that the right skills and networks are developed. Additionally, a Business Development Service has been set up for the promotion and marketing of NTFPs, as well as high value agricultural products. The TAL Programme has facilitated the signing of three Memorandums of Understanding (MOUs) between traders and farmers for the sale of mentha, cane and pipla. NTFPs such as *gurjo, shikakai, kalmegh, kurilo* and *bel*, used in cosmetic and herbal products, have also been sold. In 2004, as a result of effective marketing linkages, farmers reportedly sold NTFPs worth US$60,000, which benefited 1589 households (TAL Progress Report, 2004).

The sheer lack of financial assets and lack of accessibility to credit schemes are major obstacles to the rural poor for advancing their subsistence livelihoods. To address this, innovative financing mechanisms have been developed using local institutions such as the CFUGs. Seed money is provided to create revolving funds managed by the CFUGs, and training on accounting procedures and loan management is provided. The CFUGs form farmers groups who monitor and motivate individuals to return loans. In this manner, much-needed capital is made accessible to poor farmers for both farm and off-farm enterprises, giving them the opportunity to supplement their incomes and raise their standard of living. Income generation activities include rope making, basketry and weaving, as well as the sale of leaf plates, operation of small convenience shops and small-scale fish farming.

Community Forest User Groups of Nepal's far-western districts of Kailali and Kanchanpur are appreciative of the newly initiated fish farming project in their area. Six species of (fish) fry were released into six community ponds in January 2005, with the support of the TAL Programme (Nepal 's far-western lowland is interspersed with natural lakes and ponds). The TAL Programme has initiated the cleaning and restoration of ponds within a number of

"We got the idea and support for fish farming in our neglected lakes and ponds from the WWF TAL Programme. We now have the opportunity to generate income from these ponds. We've given priority to the poorest of the poor to generate income from the initiative," says Madan Singh Badayek, a local member of the Laljhadi Community Forest User Group. Each of the fish ponds is expected to earn from US$330-US$2700 from the sale of the fish. (WWF Nepal Programme website, October 2005 www.wwfnepal.org)

community forests by mobilizing concerned user groups. Each of the fish ponds is expected to earn from US$330-US$2700 from the sale of the fish.

3.3. Good Governance through Resource Management

Achieving good governance in the TAL is a huge challenge. The Maoist insurgency in Nepal began in 1996 from four remote mountain districts and spread throughout the country. More than 10,000 people lost their lives. It has paralyzed the government at local level and increased the insecurity and vulnerability of the rural populace. Experience has proved that resource governance through local communities is possible through periods of political instability and conflict. This is evident through the continued implementation of interventions in the present time in severely conflict-affected areas of the TAL. One of the reasons for this is because the management and utilization of natural resources is a matter of daily concern for survival. In Nepal today, this state is unable to deliver basic services in most parts of the TAL. However, CFUGs and Buffer Zone Users Committees (BZUGs) that are legally formed and registered under the government are continuing to function in these areas. In the remote, conflict-torn region, resource governance through local communities is being able to provide perhaps the only model of governance functional in the area.

The main elements of "good governance" are empowerment, accountability and transparency. Assuring access, user, and management rights of natural resources to local people is a means to empower them. The participatory processes used have taught valuable lessons on the need for transparency and accountability which resource User Groups are required to demonstrate. Capacity building of the people through training in leadership, organization, resource management, gender, and networking are helping to develop skills.

The User Groups are supported by the species conservation programme in their formation, capacity building, functioning and the preparation of operational plans based on sustainable management guidelines. Income generated by them is channelled back into the communities to carry out development projects which again helps to fulfil another function of governance — that of providing basic services. CFUGs have used their incomes to fund projects identified by the local people such as small irrigation schemes, biogas reactors and construction of health centres, roads and schools. In the Mahadevpuri and Khata areas, it is reported that the CFCC carried out a Participatory Rural Appraisal (PRA) well-being ranking to understand the needs and aspirations of the poorest families. Following the results of the PRA, they provided fallow land to deprived families to plant herbal/medicinal saplings for income generation (TAL Field Visit Report, August 2004).

Capacity building of the people through training in leadership, organization, resource management, gender and networking are helping to develop skills among the people related to governance.

4. Forging partnerships

Ultimately, achieving the landscape vision will only be possible through strong partnerships among stakeholders, governmental and non-governmental agencies working in the region, donors, the private sector, and, concerned groups. The species conservation approach emphasizes effective partnerships with local communities as resource managers, beneficiaries and stewards. This is being achieved through supporting community-based forest management. Working jointly with the government and its various line agencies is strategic to ensure sustainability. The species programme supports the strengthening of governmental institutions with technical and financial assistance and plays a key role in facilitating government coordination among sectors and partners.

Partnerships among development and conservation agencies are crucial to achieving common goals of sustainable development and improved livelihoods. WWF has been instrumental in bringing together major partners for the development of the Terai Arc Landscape Strategic Plan. These are the Department for International Development (DFID), the Netherlands Development Organization (SNV), United Nations Development Programme (UNDP), United States Agency for International Development (USAID), and WWF itself under the leadership of the Ministry of Forests and Soil Conservation (MFSC). This has led to commitment from all parties to invest their resources in the landscape and ensure cooperation at the field and central levels. SNV has committed €5.6 million for the eastern sector of the TAL and DFID is investing GB£8.2 million for the central sector. Another major partnership initiative of the TAL has been conceptually agreed recently. To be implemented by the MFSC, with the assistance of WWF, UNDP, and SNV, it will bring Global Environment Fund (GEF) partnership for US$12.5 million to the landscape. SNV has already provided €800,000 to start the Western Terai Landscape Building Programme in anticipation of the GEF Partnership Programme.

5. Lessons Learnt

As early as the 1980s, the species conservation programme in Nepal recognized that it is necessary to involve local people and address their needs to gain long-term conservation results. Through the Integrated Conservation and Development Programme (ICDP) approach, it focused on enabling local people to become resource managers and began seeking to address their priorities. This experience gave valuable insights about the conditions of the rural poor and their marginalization. It taught some key lessons on integrating rural development in effective ways. The species conservation approach today emphasizes the need for participatory processes and socio-economic research. It supports community development projects identified by local people and implemented in partnership with them. It uses technical expertise and research to strengthen enterprise and income generation.

The ICDP approach focused on site-based issues. With the implementation of the landscape level programme, it was necessary to go beyond ICDPs and site-based projects. Also, the sustainable development work in the field was expanding rapidly as the demands and needs arose, rather than through sound planning. Recognizing this weakness in the planning of its sustainable development component was a key step in overcoming this challenge. As a result, the species conservation approach in Nepal began using the Sustainable Livelihoods framework to develop its integrated work with the help of development partners. In 2003, the WWF Nepal Programme office supported the MFSC to develop the Strategic Plan for the TAL, with the assistance of DFID, to ensure an effective integration of the Sustainable Livelihoods (SL) approach for the planning of the TAL. It has since continued its efforts to integrate the Sustainable Livelihoods approach while supporting the MFSC in the implementation of the TAL Programme. This is illustrated by the fact that a Livelihoods Specialist has been contracted to develop ways to better integrate the SL approach. A monitoring framework is also being developed that will assess the sustainable development work.

Using the people-centred SL approach is helping the programme to understand the wider context and multi-dimensional nature of poverty and enabling it to better address these issues.

Perhaps the most important lesson of all from the Terai Arc Landscape comes from the experience of remaining operational in a conflict zone, and achieving planned results. Activities in the field have been hampered by the political conflict and the critical security situation in the country. The mobility of field staff, and monitoring and evaluation work, is reported to be severely affected. But the species conservation programme's integrated field activities have continued to be implemented by local people through grass roots community-based organizations such as the User Groups. This reinforces the fact that long-term conservation is only possible with people's participation and that it can be assured only when the conservation of species and habitats provide them with benefits — either subsistence, economic or cultural.

Local resident carrying off grass harvested from Tiger habitat, Terai Arc, Nepal. © WWF-Canon / Tshewang R. Wangchuk

Case Study Two:
Wildlife Conservation - a viable strategy in Namibia's Rural Development Programme.

Case Study 2

Abstract

Among poor, rural communities in developing countries, wildlife conservation is more likely to be successful when it provides either subsistence or economic benefits. Community Based Natural Resource Management (CBNRM) is being able to deliver that and more in Namibia, by reconciling international conservation priorities with local ones. As well as bringing economic returns, it has become a vehicle of empowerment for marginalized, rural people by providing them with the means of taking control of natural resources and development activities in their area. Wildlife populations are thriving under CBNRM, while rural Namibians learn that local wildlife can contribute to poverty reduction and improved livelihoods. Socio-economic research has shown that this approach contributes in a number of ways to sustainable livelihoods – by offering income opportunities, access to well managed natural resources, and as a focal point for combining sustainable natural resource use with other aspects of economic and social development. CBNRM is recognized as a rural development and poverty reduction strategy in the country.

1. The Context

The National Community Based Natural Resource Management (CBNRM) Programme in Namibia is a joint venture between government, non-governmental agencies and local communities that operates under a collaborative framework of the Namibian Association of CBNRM Support Organisations, or NACSO. It is a model for a more holistic and integrated approach to rural development with dual objectives, addressing both sustainable natural resource management and use, and socio-economic development. WWF has supported and helped to develop the CBNRM approach throughout Namibia through the Living in a Finite Environment (LIFE) project, with the aim of enabling communities to conserve and manage wildlife together with other natural resources in sustainable ways. In the Caprivi and Kunene regions of the country, it supports the Namibian NGO — Integrated Rural Development and Nature Conservation (IRDNC) — for CBNRM work. This study mainly focuses on IRDNC's work in Caprivi, while drawing on information from other parts of the country to provide a more informed understanding. CBNRM's importance as a rural development and poverty reduction strategy is recognized by the Namibian government and is woven into the second Namibian National Development Plan (NACSO, 2004).

In the Caprivi region, the project operates in the Bwabwata National Park, which forms the Caprivi Strip between the Okavango and Kwando rivers. It also operates in Eastern Caprivi along the Kwando/Linyanti River and on the eastern floodplains, which border the Chobe National Park in Botswana. The Caprivi region, one of the poorest in the country, has a population of 79,852 (2001 National Census), inhabiting an area of approximately 20,009sq km. In the past, the Caprivi region has been riven by ethnic divisions and secessionist activities. Soon after a failed rebellion in the region, it was affected by the overspill of the Angolan civil war into West Caprivi from 2000-2002. The secessionist activity, the war in West Caprivi, and political instability in neighbouring Zimbabwe led to a collapse of the tourism industry between January 1999 and early 2003. Tourists are now beginning to return to the Caprivi region again.

Vegetation in Caprivi consists mostly of Kalahari teak woodland, mopane (*Colophospermum mopane*) woodland, riverine woodland and floodplains. The soils are generally poor, consisting mostly of Kalahari sand from the riverine floodplains. Wildlife associated with the various vegetation types is present, though it has declined heavily due to poaching and habitat loss. Among the great variety of wildlife found there are: elephant; impala; duiker; roan; sable antelope; bush pig; francolin; springhare; baboon; lion; leopard; cheetah; wild dog; hippopotamus; hyena; and crocodile.

The economy of the region is predominantly rural and subsistence-led. Agriculture is dependent on rain. Most people are directly dependent on natural resources for a variety of livelihood activities. Wildlife and resource dependency is especially high among the poorest groups. Life expectancy in Caprivi is lower than other regions in Namibia. Malaria and HIV infection rates (approximately 33 per cent) are among the highest in Namibia. Other indicators of poverty are also very low. Caprivi has the highest Human Poverty Index (HPI) for the country as a whole, and the lowest Human Development Index (HDI). These measures do not capture the variation between the rural and urban areas, nor the differences between households in particular areas, but what is clear is that Caprivi is one of the poorest and least developed regions in Namibia (DFID, 2003).

Life expectancy in Caprivi is lower than other regions in Namibia. Malaria and HIV infection rates are among the highest in Namibia (approximately 33 per cent). Caprivi has the highest HPI and the lowest HDI in the country.

2. Links between Livelihoods and Wildlife

Wildlife in the Caprivi, as throughout Namibia, has always been an important resource of the people. Wild meat constitutes a part of the local diet and has an important cultural and economic value. Historically, the people utilized wildlife for their needs and continue to do so. During times of adversity and resource shortage, its use is more commonplace. It provides both food and, to a lesser extent, income security. Wildlife users tend to be from poor or less secure households, though the wealthy also continue to actively hunt (WILD Study, 2003).

How people in Namibia manage and utilize wildlife today is governed by a number of factors, including current legislation and cultural associations. Human and wildlife conflict was exacerbated in the past by policies that marginalized people's needs. Better understanding of the issues and a resulting change in legislation and approach has greatly helped to reduce the conflict. In the 1970s, commercial hunting for ivory and rhino horn was so severe that by the 1980s, only a remnant population of the African elephant and rare black rhino remained in the country. The declaration of all wildlife as state property, and the arrests of locals who took action against animals that had caused them losses, often made local people hostile towards wildlife conservation – even though it constituted an important part of their subsistence strategies, and declines in wildlife populations threatened their own survival.

In 1990, the newly independent Namibian government sought to rectify the wrongs of a protectionist, colonial approach to wildlife conservation. The policy and approach that emerged as a result of this attempt was the innovative CBNRM approach, for which legislation was tabled in 1996. The Nature Conservation Amendment Act 1996 gives conditional rights to groups of people over natural resources – wildlife in particular. They are able to benefit from their wildlife (both consumptive and non-consumptive use) through the formation of conservancies (community-based resource management committees). Rights granted to the conservancies include the rights of ownership over huntable game, revenue from the sale of game, and game products and tourism.

CBNRM has provided an opportunity for conservancies to make decisions and benefit in a number of ways, at both collective and individual levels, from the management of natural resources – particularly wildlife in their area. That the programme has been successful is evident from the support shown by the people and the exponential growth of registered conservancies: 31 conservancies have been registered so far in the country and 45 are in various stages of formation (C. Weaver pers. comm.). Five were registered in Caprivi through IRDNC support. The WILD study reports that people are currently benefiting in a number of important ways, namely:

Wildlife provides an important safety net for the people. It provides both food and, to a lesser extent, income security. Wildlife users tend to be poor or less secure households (WILD Study, 2003).

- Employment through tourism and the conservancy
- Income generation through craft sales
- Social empowerment of marginalized rural people
- Income to households from trophy hunting and joint venture lodge operations (from distribution of cash dividends to conservancies)
- Mitigation of human-wildlife conflict
- Access to meat from community harvesting.

Tourism has grown rapidly in the country since it became independent from South Africa in 1990. The majority of tourists visit the country's national parks, indicating that tourism in Namibia is largely wildlife and nature-based. Now, a growing number of tourists are visiting the more scenic communal areas, including Caprivi. It was estimated that in 2001 the total income (value-added) generated from tourism in Caprivi, Kunene and Erongo regions was approximately US$16,865,672. Of this, US$1,492,538 (value-added) is income captured at the local level in the form of wages, communal income (concession fees, bed-night levies, etc.), and profits on community owned enterprises — approximately 8 per cent of total revenue (Roe *et al*. cited in the WILD Study, 2003). Currently, 17 conservancies are receiving cash incomes from consumptive and non-consumptive tourism and there is real potential for communities to increase their overall income (C. Weaver pers. comm.).

There remain a number of areas that need to be addressed and strengthened. The contribution of meat distributed by conservancies to household livelihood security is currently not very significant due to distribution not being sufficiently regular and the quantity being inadequate for food security. Illegal hunting for household use and, to some extent, for income, continues to take place, though at a greatly reduced level. Illegal wildlife utilization, if it increases, will threaten the CBNRM objective of conserving and using wildlife for the benefit of all members. These are areas that need to be addressed to improve equitable sharing and conservation results.

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3. *Initiatives and Results*

3.1. Building Livelihood Assets

People in Caprivi are reliant on cropping, livestock, piecework, wages, pensions and the use of a variety of natural resources including wildlife (fauna), plant and forest or river-based resources for their livelihoods. Factors such as their socio-economic status and their locality within the region influence the degree of people's dependence on these. Wealth is ranked by the size of cattle holdings, with wealthier people having larger cattle holdings than the poorer who are more reliant on the harvesting of natural resources. Cattle are important for various reasons – although their contribution to household income may be less significant, they offer a degree of security for cash, consumption, draught power and cultural reasons.

Those who live close to the Zambezi River and its floodplains utilize fish resources more than those who live in the western parts of Caprivi. The proximity to urban centres and infrastructures such as roads and markets influence the combination of livelihood strategies and activities taken up by households. Social relations between kin and lineage members are important and the role of the headmen (the *induna*) and the traditional leaders is particularly strong (for example, for controlling access to key resources). Adopting the CBNRM approach for wildlife conservation has meant considering all these socio-economic factors to build the assets and livelihoods of the people.

Strengthening the people's assets

Literacy is low in the Caprivi. The WILD study revealed that 30 per cent of respondents over 20 years of age had no formal education. The 1991 census reported that over one third of the population (aged over 15) had never attended school. In addition, it is generally accepted that one of the legacies of protectionist legislation has been the loss of the institutions and the skills for management. WWF is supporting CBNRM to develop the human and social capital through emphasis on capacity building. This has resulted in the registration of five conservancies with seven more emerging, currently in various stages of formation (IRDNC Mid Term Evaluation, 2003). These conservancies have developed, or are in the process of developing, basic benefit distribution plans, registering their members, negotiating boundaries and partnerships, and managing their resources and any outside grants made available to them. They are learning to adhere to general accounting procedures, develop budgets for income and expenditures, and to be accountable and transparent. Some conservancy members are also learning computer skills. Special emphasis is placed on building gender equity into the CBNRM Programme to ensure that women have a voice in any decision-making processes, stand for election on committees, and benefit from capacity development.

Developing resource management and utilization skills are helping the communities not only to earn good incomes but also to maintain effective governance of natural resources, and build social cohesion and networking. Developing negotiation skills has led to successful negotiations over boundaries for resource management, which in turn have resolved disputes and conflicts that spanned generations between neighbouring villages. Two conservancies have negotiated lucrative joint ventures with private sector operators. In addition, the local people are learning entrepreneurship and tourism management skills. Twelve craft groups have been formed and training provided to improve skills and entrepreneurship. Simultaneously, two craft markets have been developed where the products can be sold. At the same time, a core of experienced and skilled CBRNM practitioners has been created, such as the community resource monitors, game guards, conservancy managers and committee members.

In terms of infrastructure, six community campsites were supported in the area that give the conservancies and their members a direct stake in the tourism sector, as well as contribute to enhancing their skills in the tourism business. Other support has included the construction of five conservancy offices.

Table 1. Annual Projected Revenues to Conservancies in the Eastern Floodplain (in US$)

Conservancy	*Community Income*	*Less Conservancy Running Costs*	*Net Annual Community Benefit*	*Plus Direct Wages*
Impalila/Kasika	131,141	34,328	96,813	112,477
Kabulabula	53,812	34,328	19,483	39,071
Nakabolewa	55,905	34,328	21,577	36,703
Salambala	63,388	34,328	29,060	45,582

Tourism as a strategy for rural development and poverty reduction

Financial benefits accrued vary from conservancy to conservancy depending on the resources available, the attractiveness of its tourism ventures, the ability to produce and market crafts, and finding the right partners from the private sector. Promoting tourism as a means to capture revenues has been a key component of CBNRM. Tourism provides a mechanism for people to benefit directly from wildlife and generates incentives to improve CBNRM. The following table shows the annual projected revenue to conservancies in the eastern floodplain, based on a conservative estimate of 5 per cent of gross revenue plus wages (IRDNC Mid Term Evaluation, 2003).

The WILD project identified the financial benefits at the collective level as well as the individual level of Community-Based Tourism *(see Table. 2, next column).*

Of the two craft markets supported by WWF, the leading one is Mashi, which is a local outlet for crafts made by over 300 people (mainly women) from 11 groups across the Caprivi region. In 2003, the sale of crafts from Mashi amounted to US$11,053, whereas from Ngoma market it was a much lower figure of US$987.

The community campsites were severely affected by the political unrest within the Caprivi region during 2001 and 2002. However, with the return to normality, they are both generating income. In the case of two new campsites at Bum Hill and Nambwe, both of which are extremely attractive and well-developed, rough estimates put the potential gross incomes of each at US$29,850. The table below gives a summary of the gross revenue earned by the community campsites (IRDNC Mid Term Evaluation, 2003).

Table 2.
Financial Benefits of Community-Based Tourism

Collective Level	*Individual Level*
Income available for distribution	Cash wage from employment to help meet basic needs, or for investment
Income available for investment (possible long-term use as community equity in tourism)	Income from craft sales to diversity livelihoods
Income available for social projects	Tips at traditional village/ campsites
	Income from building enterprise, selling reeds, thatch grass

Table 3. Gross Revenue Earned by Community Campsites in Caprivi (in US$)

Campsite	1999	2000	2001	2002	2003
Salambala	1370	1625	1780	1144	828
Kubunyana	2805	2093	1256	3424	5862
Nambwa	N/A	N/A	N/A	N/A	3128
Bum Hill	N/A	N/A	N/A	N/A	2510
N//goabaca	2978	0	120	1479	2005

Using the CBNRM approach for wildlife conservation has resulted in bringing private investment into the rural communities. Two joint ventures between private sector operators and conservancies have been facilitated, which will be important as a model and example for future negotiations and joint ventures with the private sector. Both are based on international trophy hunting. The conservancies which have entered these ventures are Salambala conservancy and a consortium of Kwando/ Mayuni/Mashi and Wupara conservancies. The value of the joint venture with Salambala for the period 2000-2004 was US$34,431 per annum. For the consortium of conservancies it was US$64,000 per annum for the period 2003-2004. It is expected that each of the four conservancies will receive US$26,866 per annum (IRDNC Mid Term Evaluation, 2003).

In 2004, the total revenue generated from CBNRM in Namibia was well over US$2.1 million (LIFE Report, 2004). With the growth in tourism, incomes from the overall CBNRM Programme grew from nothing to over US$1,884,058 in 2003 (NACSO, 2004). Joint venture tourism lodges and camps are by far the most lucrative source of income to the conservancies. A total of US$582,332 was earned

from these ventures during 2003, making up to 46 per cent of all conservancy income. Financial benefits to the conservancies and local communities involved included: direct revenue-sharing; concession fees paid annually; a monthly lease fee; and levies for every bed night sold by the lodge and employment. The joint ventures have provided 199 full-time and 46 part-time jobs for members of the conservancies involved (NACSO, 2004).

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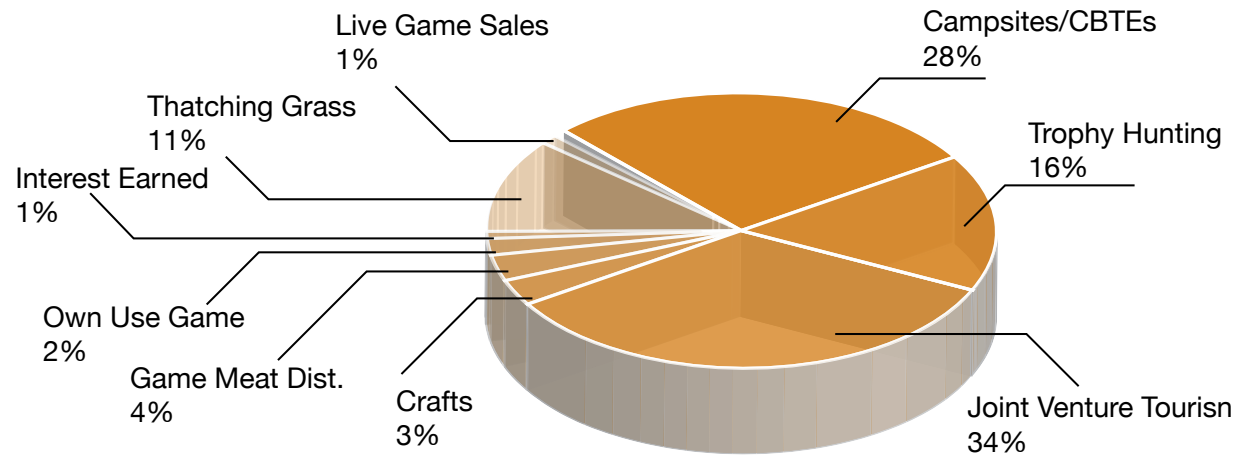
Figure 3.
Total Benefits Generated from CBNRM in Namibia in 2004



Source: Living in a Finite Environment (LIFE) Project End of Project Report, 2004 (US$1 = Namibian$6.7)

Sustainable management of natural capital

IRDNC's CBNRM approach has contributed to the protection and recovery of wildlife species, and improved wildlife management practices. It has promoted wildlife and tourism as land uses in communal areas and demonstrated the economic value of these resources to the national economy. IRDNC's Mid Term Evaluation (2003) reports that "in key areas wildlife numbers are increasing and in some cases wildlife is returning to areas from which it had disappeared, as the attitudes of people become more positive."

These achievements are even more significant in the Caprivi, one of the poorest regions in Namibia, where the people are dependent on the use of a variety of natural resources including wildlife (fauna), plant and forest or river-based resources for their livelihoods. Sustainable management of natural resources in the region has meant the conservation of a valuable asset of people who lack other assets and opportunities. Strengthening CBNRM has led to its recognition as a rural development strategy by the government. It has subsequently been incorporated into the second Namibian National Development Plan. This mainstreaming of wildlife conservation into development strategy is an important step by the country in the direction of sustainable development and the long-term conservation of the rural people's resources.

Strengthening CBNRM has led to its recognition as a rural development strategy by the government. It has subsequently been incorporated into the second Namibian National Development Plan.

3.2. Building Livelihood Strategies and Activities

Livelihood strategies are what people do in terms of production and consumption, in mediating social and institutional relationships, and in the activities that they engage with to meet their livelihood needs and expectations. Caprivi is one of the poorest and most vulnerable regions of Namibia with the highest HPI in the country. The WILD socio-economic survey conducted in 2002 in three conservancies of Caprivi reported that there were few income opportunities. Only 4.8 per cent of individuals of working age reported that their primary occupation was formal employment and 36 per cent of individuals over the age of 16 had no income. Natural resource use provides a measure of security, especially for the poorer households. This includes harvesting reeds and thatch grass for repair of housing and courtyards, as well as for sale. Other natural resource uses are wild fruits, water lilies, fish, and palm for craftmaking. For some, wild animals such as duiker, warthog, impala, and spring hares provide additional food security.

Investments for wildlife conservation through the community-based integrated approach are helping local people to build their livelihood strategies and activities by diversifying, minimising risk, coping with natural setbacks and maintaining flexibility. These include the consumptive and non-consumptive use of wildlife and other natural resources, and the promotion of tourism and its benefits to the people. Local people in tourism areas are frequently marginalized from benefiting from tourism activities. Community-based tourism initiatives and enterprises are key components of IRDNC's work, which are supported by WWF in Caprivi to ensure that the local population benefits from tourism. A variety of community-based tourism activities are supported, such as community campsites and craft making. The project is helping to diversify the products as well as improve the quality and quantity through training and strengthening management. A framework for joint venture negotiations has been developed to help conservancies procure beneficial partnerships with the private sector, and joint ventures have been successfully negotiated. These are reportedly managed efficiently by the conservancies.

To mitigate human-wildlife conflict and reduce the vulnerability of the people, the Project has spearheaded problem animal management initiatives like the piloting of Human Animal Conflict Conservancy Compensation Schemes (HACCCs) in three conservancies. By securing Global Environment Fund (GEF) small grant funds for an integrated programme, the product "revira" is being trialled, which has been used successfully as an animal deterrent in Europe with deer and wild boar. The Project is continuing to investigate appropriate mitigation measures for crop losses by linking crop loss compensation with the equitable distribution of conservancy revenue. The HACCCS being implemented by two conservancies – Mayuni and Kwandu – have carried out 23 payouts totalling US$3284 in its eight months of operation. In addition, through support from WWF's African Elephant Programme, human-elephant conflict mitigation work is currently being expanded in Caprivi.

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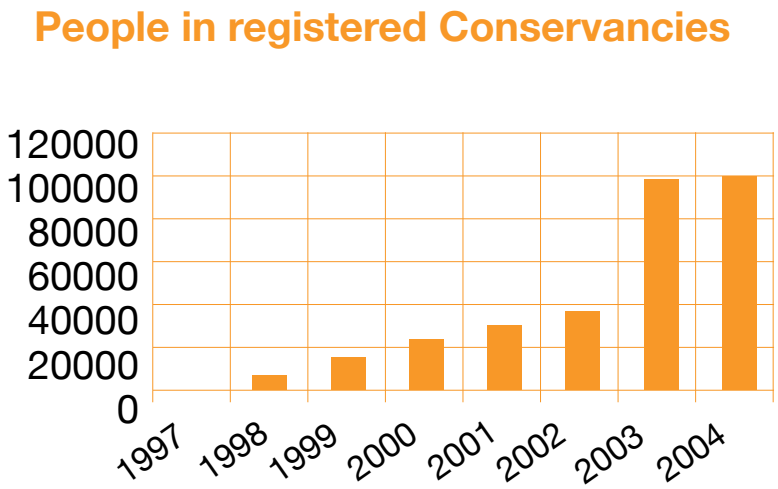
It is unrealistic to expect wildlife and tourism to be the main vehicle for rural development in Caprivi. However, to quote IRDNC's Mid Term Evaluation Report (2003), "the broad range of benefits to communities brought by conservancies can contribute to poverty reduction in Caprivi by a) providing significant amounts of income for the collective use of communities; b) providing small, but important amounts of household income in a cash starved society and; c) developing the skills and capacity and institutions among local people to manage their own affairs".

3.3. Governance through Rural Empowerment

Wildlife conservation is contributing to achieving good governance through rural empowerment. The CBNRM approach devolves rights and responsibilities to the local people over wildlife and other natural resources — the major asset of the people in remote rural communities — which provides them with opportunities for income generation and enterprise development. It assists them to acquire skills for managing their area and planning for their own future. In Caprivi, this is achieved largely through a process of mentoring, where project personnel work very closely with individuals or organizations (i.e. conservancy committees) to develop their capacities to undertake defined activities. It is complemented by formal training, where such training is available. The conservancy committees are democratically elected members and are responsible for: institutional management; planning; implementation; financial management; reporting; networking; and communication. They are involved in the development of land, natural resource and tourism management in their areas. That governance and rural empowerment is being achieved is evident from:

- Rights secured by rural communities to use and manage natural resources
- Increased capacity in decision-making, problem solving and conflict resolution
- Increased participation of women in decision-making processes
- Transparency and accountability in the conservancies being developed and maintained
- Improved links and coordination between communities, traditional authorities, local and national government
- New skills that can create income, diversify livelihoods, and enable rural people to take control of their lives.

Figure 4. Total Number of People Involved in Conservancies in Namibia



Source: Living in a Finite Environment (LIFE) Project End of Project Report, 2004

The success of the CBNRM approach in Namibia has led to a rapid growth in the number of conservancies being formed and registered, which has meant that empowerment is becoming possible for more rural communities. Over 7 million ha of communal land are now managed as communal area conservancies. Almost 100,000 people live in these areas, and over 40,000 of them are registered members (NACSO, 2004).

4. Lessons Learnt

CBNRM has contributed in a major way to the development of wildlife conservation strategies for the future. It has reinforced the importance of ownership and user rights of wildlife and other natural resources by local communities. Attaining rights and empowering local people to manage and conserve their wildlife proved to be highly effective. The conservancies demonstrate the potential to establish long-lasting community institutions that will continue to serve local residents and maintain conservation objectives after external support has been withdrawn.

The collaborative partnerships under the NACSO, between the government and non-governmental agencies, led to broad-based support of the CBNRM and effective implementation throughout the country. This has allowed biomes not under protected area coverage to benefit from community management. Joint ventures with the private sector have profited rural communities by building their capacity for enterprise and generating financial returns. These experiences emphasize the importance of partnerships for extending wildlife conservation beyond the protected areas' coverage.

The challenge for CBNRM's future success in Namibia lies in continuing to provide sufficient benefits to make living with wildlife worthwhile, by mitigating the increasing human-wildlife conflict brought about through successfully recovering wildlife populations. The conservancies need to deliver sufficient social and economic benefits to outweigh the costs caused by increased wildlife numbers. Serious attention and investments must be made to ensure that human and wildlife conflict mitigation measures are developed in effective ways. Another area requiring concerted efforts is the need to address the issues of equitable sharing among the poorest and most vulnerable groups. At the same time, strong capacity building needs to be continued to overcome the low literacy levels and lack of business skills that hinder rural communities. As before, innovation and flexibility will remain essential to further develop the programme.

Himba children, Kunene Province, Namibia. © WWF-Canon / John E. Newby

Case Study Three:
Mountain gorilla conservation contributes to local livelihoods around the Bwindi Impenetrable National Park, Uganda.

Case Study 3

Abstract

Much of the work undertaken by the International Gorilla Conservation Programme (IGCP) is directly relevant to local livelihoods and poverty alleviation, even while its overriding objective remains the survival of the world's last remaining mountain gorillas. IGCP has worked closely with partners including Uganda Wildlife Authority (UWA), the Institute of Tropical Forest Conservation (ITFC), CARE's Development Through Conservation Project, and the Mgahinga and Bwindi Impenetrable Forest Conservation Trust (MBIFCT), using participatory processes to develop livelihood-based initiatives to address human-wildlife conflict. It is enabling good governance by supporting the rights, empowerment, and capacity of indigenous and local communities in sustainable natural resource management. This case study, based on IGCP's work, exemplifies how gorilla conservation interventions have contributed to developing capacities, income and employment, and the infrastructure of rural communities surrounding national parks.

1. The Context

Bwindi Impenetrable National Park (BINP) and Mgahinga Gorilla National Park (MGNP) in southwest Uganda are among the most biologically diverse forests in East Africa. The Afromontane forests have long served as a vital component in local people's livelihoods and are home to the world's only remaining mountain gorillas. MGNP is contiguous with protected areas in Rwanda (Parc National des Volcans) and Democratic Republic of Congo (Parc National des Virunga). These parks, together with BINP, are the only remaining habitat of the 700 mountain gorillas that survive in the world today. In recent years, the gorillas have become the mainstay of Uganda's emerging tourism sector. A series of coordinated initiatives involving conservation and development organizations have been active in the area, notably the Impenetrable Forest Conservation Project (WWF) — which later became the Institute of Tropical Forest Conservation (ITFC) — the International Gorilla Conservation Programme (IGCP), CARE's Development Through Conservation Project, Uganda Wildlife Authority's (UWA) participatory management planning and ecotourism development, and the Mgahinga and Bwindi Impenetrable Forest Conservation Trust (MBIFCT).

The International Gorilla Conservation Programme (IGCP) is a collaboration of WWF, African Wildlife Foundation (AWF), and Fauna and Flora International (FFI). This case study is mainly concerned with the livelihood activities and benefits that gorilla conservation work through the IGCP has helped to deliver to the communities living around the BINP. Some reference has also been made to similar activities that are being carried out concurrently around the MGNP by the IGCP. Both the national parks are located in the southwestern part of Uganda. BINP covers a total area of 330.8sq kms, whereas the total area of MGNP is 33.7sq kms.

BINP is characterized by a great diversity of plant and animal species with a number of regional endemics. It serves as an enclave for at least twelve species known to be threatened with global extinction, including the critically endangered mountain gorilla (*Gorilla beringei beringei*). The forest has various ecological values including soil conservation, water catchment, biodiversity, carbon storage and future use. In recognition of the collective values and significance of the forest, Bwindi was declared a (Natural) World Heritage Site in December 1994. MGNP was gazetted with the main purpose to protect the mountain gorillas, and to conserve the ecological resources in the park.

Agriculture is the main economic activity of the largely poor, rural communities around Bwindi and Mgahinga. High population, polygamy and the practice of dividing land among the sons have fragmented landholdings. Land shortage and intensive cultivation have led to soil degradation and poor yields. Agricultural encroachment of the parks has occurred in some places. The rural areas around the parks are among the most densely populated areas in Africa. This is probably due to the highly fertile soils and climate that enable farming to take place all year round, and two to three crops to be harvested each year. The provisional results of the 2002 Housing and Population Census indicate high population densities in the districts where the national parks are located. Kabale district has an average population density of 290 per sq km, Kisoro district has 323 per sq km and Kanungu has 160 per sq km (Plumptre, Kayitare *et al.*, 2004). Fuelwood is the main source of energy for cooking. About 85 per cent of the fuelwood is produced from the farmers' woodlots, which were planted in the past due to various interventions. However, timber, poles, stakes, fuelwood, and bamboo remain some of the most commonly and illegally exploited resources from the two parks.

Around Bwindi, Bakiga is the main ethnic group, numbering about 90 per cent. Bafumbira account for about 9.5 per cent, and the remaining are made up by the Batwa, Bahoro and Bahunde groups. The areas adjacent to the MGNP are mainly settled by Bafumbira, with a few Batwa (0.5 per cent). The Bakiga and Bafumbira were known to carry out logging, pit sawing, hunting and mining in the forests before these were gazetted as national parks. Today, it is mainly the beekeepers, traditional healers, blacksmiths and craftmakers who utilize the forest resources in various ways under agreements with UWA, the park authority. Among the poorest in the area are the Batwa people who were solely dependent on the forest for their livelihoods before these became gazetted as parks. They are marginalized by the local communities, are landless, and work as labourers for other farmers.

The three countries of Uganda, Rwanda and the Democratic Republic of Congo (the DRC) have undergone long periods of conflict, rebellion and civil war. It is only Uganda that has stabilized in the past 15 years. Rwanda and DRC are slowly gaining stability, but the countries are still troubled and outbreaks of violence continue. The

IGCP worked throughout the years of conflict carrying on activities that could be implemented. These included trans-boundary collaboration, protection measures, anti-poaching activities (poachers have destroyed entire gorilla family groups in their attempts to capture infant gorillas for zoos), habitat conservation, community participation, and development of economic alternatives. IGCP supported the park staff in Rwanda and the DRC for over six years during the worst of the fighting. The dangers that these staff faced were huge and many lost their lives. It is due to all these efforts that the mountain gorillas have survived and multiplied.

2. Links between Livelihoods and Wildlife

IGCP focuses on two key targets – conservation of the mountain gorilla populations and regional Afromontane forest habitats. The programme's strategy is based on identifying threats to these targets and implementing specific strategies to mitigate these threats. Having recognized that the primary threat to the gorillas now is the population pressure and demand for agricultural land, the key strategic objectives involve forming and strengthening linkages with local populations and promoting the flow of benefits from conservation to local people.

When Bwindi and Mgahinga were gazetted in 1991, traditional forest users, especially the Batwa people, were denied access to the forest resources that provided their livelihood. Historically, local communities had used Bwindi Forest as a source of timber, minerals, non-timber forest products (NTFPs), game meat and agricultural land. As a result, conflicts arose between the Protected Area and locals. The loss of biodiversity became widespread due to fires and intense poaching. The Afromontane areas around the two parks are inhabited by some of the poorest people in Uganda. Poor people are typically described as those who lead subsistence lives, work as wage labourers to supplement incomes, own no livestock, have poor houses (without iron-sheeted roofs) and cannot afford to send their children to school. The negative impacts on protected areas such as crop damage and restricted resource access impact the poor the most. At the same time, the poor are more dependent on protected areas for their subsistence, or as an illegal income source.

To address these issues, WWF became involved in identifying and utilizing environment-livelihood linkages to generate dual benefits for conservation and rural communities. This led to the development of a Collaborative Forest Management (CFM) approach through the creation of Multiple Use Zones (MUZ) that were introduced in Bwindi in 1994 (with WWF's support) to the UWA and ITFC. Through this mechanism, locals were allowed access to the forests for collection of medicinal plants and weaving materials, and the placement of hives for beekeeping. They were given employment and responsibility to help park managers in the protection and maintenance of biodiversity and ecosystem functions. From 1991, gorilla tourism and revenue-sharing mechanisms were also developed around the two parks. These measures helped to resolve the conflict situation. A recent socio-economic study reported that over 60 per cent of people in most communities bordering protected areas felt that they benefited from the forest and could name several forms of benefit (Plumptre, Kayitare *et al.*, 2004).

The negative impacts of protected areas, such as crop damage and restricted resource access, impact the poor the most. At the same time, they are more dependent on protected areas for their subsistence, or as an illegal income source.

Though gorilla tourism brings only limited numbers of visitors, it is benefiting some areas around the park in significant ways. In 2003-2004, BINP received 4674 tourists, whereas MGNP received 1779. IGCP has helped to develop a revenue-sharing mechanism for the local communities with the UWA — 20 per cent of the park entry fee (i.e. US$20 per person) is channelled back into the local communities through the revenue-sharing programme. This income has been used for local infrastructure development, such as the renovation of school buildings and health centres, and for building feeder roads. In addition, since 2004, US$9 from each gorilla permit fee (i.e. US$360 per person per day) is channelled back into the communities. Gorilla tourism is delivering direct economic benefits at household level by providing employment and income. In the tourism area of Buhoma, which borders BINP, over 90 per cent of the local community benefit from tourism in some way; mainly through primary employment in the park, tourism facilities, sale of produce (agricultural, livestock, tree products, etc.), trade, and services including entertainment and sale of crafts (Plumptre, Kayitare *et al.,* 2004). All this shows that habitat conservation of the mountain gorillas has meant not only the conservation of the rarest vegetation type in the African continent, but also the sustainable management of valuable livelihood resources for the surrounding human communities.

This transformation in the relationship between the park and people over time can be illustrated by a local story. In 1991, when the BINP was established, the community of Mukona Parish set fire to around 10sq kms of forest to voice their protest, as well as to clear the forest land for claiming. Over the years, as the park authorities became more concerned and responsive to local concerns, this antagonism changed to appreciation. In 1998, when a fire started accidentally in the southern part of Rubuguli Parish, the same villagers of Mukono Parish walked for five hours without any remuneration or incentive to put the fire out (S. Asuma pers. comm.).

3. Initiatives and Results
3.1. Building Livelihood Assets

Strengthening human and social assets

IGCP is working to develop the human and social assets of the local people living around the two protected areas through training and mentoring. The project is active in nine parishes bordering BINP and three parishes adjacent to MGNP. Its success in developing the capacities of the local people is evident in the organization, negotiation and business skills of the people. The largely illiterate people of the area have formed functional groups for activities such as tourism, beekeeping, craft making, and revenue-sharing with the park authorities and for infrastructure development.

In Kabale district, only 52.6 per cent of the people are literate (Kabale District Local Government, 2005). The project has supported the capacity building of local people here. They have become informed of their rights and their potential resources and are learning to plan for the long term. An area where they have made significant progress is in learning to negotiate with the government, non-governmental organizations (NGOs), and the private sector. This is evident in the intensive negotiation process that is currently underway between the UWA and the local people for the review of the Multiple Use Zones. Local people are also negotiating successfully with private companies to bring their investments into the area.

Supporting basic infrastructure and equipment

Rather than directly supporting infrastructure, IGCP has helped to develop mechanisms for channelling park revenues, as well as the collective earnings of the community, to build necessary infrastructure. The project supported the establishment of two community campsites near BINP and MGNP. The revenues that these campsites are generating are the collective income of the community and are being used for rural infrastructure development. The Buhoma Community Campsite has invested its income in the past three years (2001-2003) for the following:

Table 4. Income from Buhoma Community Campsite Invested in the Local Community

Infrastructure and/or Equipment	*Funds Invested (US$)*
Kanyashande Primary Schoolhouse built	***4,000***
Rubona Primary School (one classroom block and one office block built)	***3,086***
Muona School (three classroom block built)	***2,285***
Buhoma Nursery School (four classroom block built)	***3,543***
Bwindi Women's Group Office built	***1,714***
Feeder road to Mukongoro	***200***
Equipment to Murambira Pineapple Growing Group	***102***
Harvesting materials, beehives, training for Nyakeina Beekeepers Association	***400***

(Source: Buhoma Community Campsite Records)

In 1996, Community Protection Institutions (CPI) were formed under the Revenue-sharing Programme of UWA. IGCP has helped to develop this programme with the UWA and CARE. Twenty per cent of the park fees are channelled back into the communities for infrastructure development through the CPI. Through this programme, the following projects were supported around BINP from 2001-2003:

Table 5. Local Infrastructure Supported by 20% Revenue Shared with BINP

Infrastructure	*Funds invested (US$)*
Twelve primary schools (renovation, addition of classrooms, improving roofing, procuring desks)	***2,000***
Two health centres (one renovated and one constructed)	***2,114***
More than six kms of feeder roads built	***2,000***
Sub-county hall and office block built	***8,000***

(Source: Revenue-sharing Project Updates, BINP, 2003)

A gravity drinking water scheme for the Buhoma village (supported by the IGCP, Buhoma Community Campsite, and other donors such as the UNDP/GEF small grants programme), has built 21 water taps throughout the village. The scheme has taken water to two schools, a health centre, seven tourist campsites and about 315 households. IGCP provided partial financial assistance but, more importantly, it helped the local people to negotiate with the protected area authorities for the use of the water source located inside the park, and organized them to raise funds from various sources.

Diversification and cash benefits lead to stronger financial assets

Tourism is the major economic activity supported by IGCP. Financial returns from tourism may be collective (from a community campsite) or individual (from employment or entrepreneurship). The collective income goes to the community as a whole and is utilized for various community-identified projects such as infrastructure development. Tourism benefits to the individual are through employment in the campsites and other private ventures such as craft making; employment in providing transport facilities to tourists; and marketing of agricultural produce.

IGCP has supported the construction of two community campsites and strengthened their management by local people through training in management, accounting and organization. The people of Buhoma, Mukono parish, are by far the ones who are benefiting the most from tourism, whereas the other tourism sites are developing at a slower pace. Buhoma Campsite earned US$70,628 in 2004. It employs 11 local staff permanently. There are six private campsites in the vicinity that employ more staff, though some of them are non-locals. On average, a campsite

employs ten people, half of whom are likely to be locals. Other people employed through tourism, directly or indirectly, include about 15 local guides and 20 porters, two full time employees of the grinding mill, and many craftmakers. In addition, there are seven craft shops in Buhoma operated by individuals on their own initiative.

Table 6.
Buhoma Community Campsite Revenue

Year	*2001*	*2002*	*2003*	*2004*
Collective Income In US$	*22,640*	*37,912*	*57,103*	*70,628*

(Source: IGCP)

The revenues from the campsites are being invested in local infrastructure. Buhoma Campsite has bought a car, set up a grinding mill, and provided financial support to the gravity water scheme that supplies drinking water to the village.

Diversifying farm income

The IGCP is helping to support various enterprises that contribute to improved livelihoods. These include beekeeping, mushroom farming, rearing pigs, sheep and poultry, and operating small shops. There are 400 farmers currently involved in beekeeping in the Multiple Use Zones of BINP that border six parishes. Since farmers keep different numbers of beehives, it is difficult to report how much they earn individually. It is estimated that a farmer can earn approximately US$17 per annum from one beehive if he is able to get two harvests from it (I. Garakumbe pers. comm.).

About 200 women have been supported to grow mushrooms in three parishes bordering MGNP. In 2003, these women produced 800kgs of mushrooms, which sold for around US$1830. The mushrooms are bought by local people and the tourist camps. Although the income from these activities is small, it is nonetheless a significant contribution to each household. The beekeepers are reportedly using their income to pay tax and their children's school fees. A sampling survey carried out in the two districts of Kisoro and Kanungu reports that the average monthly household expenditure is as low as US$15. Household monthly expenditure for food, sugar, salt, and drinks amounted to 31.7 per cent. This was followed by expenditure on clothing and footwear (which was 17.2 per cent); health care and medicine (which amounted to 14.6 per cent); and expenditure on education (which was 12.1 per cent) (Income and Enterprise Baseline Survey, AWF, 2003).

A sampling survey carried out in the two districts of Kisoro and Kanungu reports that the average monthly household expenditure is as low as US$15.

Conserving natural capital

The conservation of the Afromontane forests – habitat of the mountain gorillas – is integral to the conservation of highly important ecological values for the local people and the nation, including soil conservation, water catchment, biodiversity, carbon storage and future use. The introduction of the Multiple Use Zones in the national parks, revenue-sharing, and the gradual inclusion of the local people in conservation management, addressed the park-people conflict and led to conservation gains. The massive destruction of forests through illegal clearing and unsustainable practices such as pits awing and mining have been greatly reduced and halted in critical areas. Degradation of the environment has stopped, and signs of regeneration are visible in some patches.

The gorilla population is growing slowly in both the national parks in Uganda. In BINP, the census taken in 2002 recorded 320 gorillas, which is 20 more than the census taken five years prior. In the MGNP and its bordering parks in Rwanda and Congo, a census had not been taken since 1989. The recent census carried out in 2004 recorded 382 gorillas in that group of parks — an increase of 17 per cent, which was remarkable considering the intense political instability, civil war and genocide that occurred in the area. At the same time, community appraisals show that the numbers of other wildlife are also increasing (A. McNeilage *pers. comm*.) IGCP has been successful in strengthening the protected area authorities and developing regional collaboration. Since 1991, it has supported and worked to strengthen park management through the long years of conflict in the region. An MOU between the three countries was signed in 2003 for regional collaboration for gorilla conservation. This has been translated on the ground with active trans-boundary cooperation between the park authorities of all three countries.

3.2. Building Livelihood Strategies

The people living around BINP and MGNP are mainly subsistence farmers. High population, polygamy and the practice of dividing land among sons have fragmented landholdings. Intensive cultivation has led to soil degradation and poor yields: 60.7 per cent of households are reported to be dependent on agriculture as their source of income and livelihood. The highest per household income belongs to those engaged in non-farm employment, followed by those self-employed in business (Income and Enterprise Baseline Survey, AWF, 2003).

IGCP seeks to promote opportunities, choices, and diversity for people in order to improve their livelihood strategies, which are a combination of activities that people undertake in order to achieve their livelihood goals of well-being. Through the introduction and development

of the Multiple Use Zones, local people around BINP have had the opportunity to pursue their traditional means of diversifying their farm incomes with beekeeping and basket weaving. A number of individuals were able to supplement their incomes by being able to continue their practice of traditional healing – with the access and use of medicinal herbs.

The farmers cultivating fields adjacent to the park are vulnerable to damage from wildlife. Those fields, which are near areas habited by gorilla family groups, are inevitably vulnerable to damage from the animals; particularly during periods of food shortage in the forest. To address this issue, the project supports the Human-Gorilla Conflict Resolution Programme (HUGO) volunteer members with training in order to keep watch and chase away the gorillas. The project is also supporting the cultivation of alternative crops such as tea, which is not eaten by wildlife. Local people report that the HUGO members have been effective in minimizing damage caused by gorillas. As an incentive, the HUGO members were assisted to start small farm enterprises such as raising small livestock. Some of the members have opened shops with support from the project.

Tourism has been a lucrative off-farm activity for the people of one parish adjacent to BINP and, to a lesser degree, of a second parish near MGNP. Through employment and enterprise in tourism, people have found new opportunities, learnt new skills, and been greatly helped to improve their livelihoods. It is important to realize, however, that it is not possible for tourism to become available and advantageous to all. In the case of gorilla tourism, the limited number of the gorilla family groups will automatically limit tourism development. With successful negotiations between parishes and private companies, as well as the UWA, there is an indication of increasing well-regulated tourism in a few other areas, that will benefit about five parishes, altogether. However, it is not likely that it can be spread to all parishes nor is it IGCP's intention to attempt to do so. The project will support the livelihood strategies of people of other parishes in diverse ways, particularly through farm enterprise development.

3.3. Enabling Good Governance

Among the key capabilities that enable good governance are: the strengthening of linkages between public institutions and civil society; ensuring the accountability of public institutions; access to information about government programmes and entitlements; empowering the poor and the vulnerable to influence government policy; and facilitating private sector investments to promote economic growth. IGCP is working on these capabilities with the rural communities through its integrated approach for gorilla conservation. It is achieving this by supporting the rights, empowerment and capacity of indigenous and local communities in sustainable natural resource management and conservation.

The project has been instrumental in empowering the locals to negotiate for the reform of UWA policy – from a colonial, protectionist one that excluded the locals, to a more participatory approach. Today, BINP employs a warden and a number of rangers specifically to work with the community. The park, with the help of the project and the ITFC, has designated Multiple Use Zones where local people can continue their traditional beekeeping and have access to weaving materials and medicinal plants. Revenue-sharing mechanisms return 20 per cent of park revenues to the local area. Recently, successful negotiation by the locals resulted in the park authorities granting the community of Nteko parish in Nkuringo the sole rights to the gorilla viewing of one gorilla family group. This has, in turn, given the people a strong leverage to negotiate with private companies to invest in the building of a tourist campsite, which will benefit them through revenue and employment. The community has formed the Nkuringo Conservation Development Foundation (NCDF) and has raised US$2285, in addition to acquiring land for the campsite.

3.4. Participatory Processes and Partnerships

Stakeholder consultations are central to species conservation and have been carried out by the IGCP over the years. They include a number of participatory studies on the attitudes and aspirations of the people. Participatory assessments have been carried out, particularly relating to the Multiple Use programme and the Revenue-sharing programme. However, some of the assessments were carried out in an *ad hoc* manner as the need arose. This also led to difficulties in collecting data for this study. IGCP is seeking to remedy this by developing a socio-economic baseline. It is focusing on expanding its community involvement component with a planned approach in the future. Funding and influence from the USAID has helped to emphasize this.

An income and enterprise baseline sampling survey was completed in September 2003 for the districts of Kisoro and Kanungu. In 2004, IGCP – together with World Conservation Society (WCS) and CARE – supported the study of the socio-economic status of people living near protected areas in the Central Albertine Rift. This report looked at three areas, namely: the socio-economic status of local communities in the Central Albertine rift; an assessment of the economic situation and income

Local people have successfully negotiated for the establishment of Multiple Use Zones in the parks and revenue-sharing mechanisms that return 20 per cent of park revenues to the local area. Negotiation by the locals has resulted in the park authorities granting the community of Nteko parish the sole rights to the gorilla viewing of one gorilla family group. The people now have a strong leverage to negotiate with private companies to invest in tourism development.

generation; and, finally, the relationship between the local community and protected areas.

IGCP has helped to develop strong networking and cooperation between the various agencies in the area and the local community. The agencies active in the area include UWA, the local government, CARE, MBIFCT, IGCP, other smaller NGOs, and the local bodies formed for enterprises such as beekeeping, tourism, etc. The Revenue-sharing programme is implemented with the close collaboration of the governmental agencies, non-governmental agencies and the local community. The effective use of collective revenue from tourism can be attributed to this successful partnership effort.

4. Lessons Learnt

IGCP is an example of a project that has evolved over time and, with experience, has become holistic and people-focused. These lessons were learnt throughout difficult years of political instability, violence and economic crisis in the three bordering countries where the national parks are located. The experience paved the way in developing an integrated approach to gorilla conservation that aims to mitigate poverty driven overexploitation and conflict through livelihood-based conservation initiatives.

In recent years, IGCP has emphasized its work with the local communities, particularly in enterprise development. It will benefit from detailed planning in order to inform a more comprehensive community development component that is closely linked to its conservation objectives. Identifying key areas of intervention are necessary to enable the project to stay focused. There is a need to target the Batwa people who continue to be marginalized by the local communities and to some extent by NGO and government projects. The project also needs to emphasize the inclusion of women more. Participatory assessments using the Sustainable Livelihoods framework would help to better understand the aspirations, resources and limitations of the people, which will contribute to a more effective and integrated approach.

There is a need to develop a strong socio-economic baseline, which the project has recognized and is beginning to do. While stakeholders' consultations and participatory studies have been carried out regularly, these appear to have been *ad hoc* or donor driven at times, and documentation is not systematic. Difficulties were experienced in collecting the data during this study, although many participatory and evaluative studies had been carried out before. While expanding its remit and scaling up, the project and similar interventions would benefit greatly from strong documentation and baseline data on its earlier experiences and assessments.

Mountain gorilla youngster resting on a silverback, Uganda.

Case Study Four:
Partnering to secure the future for people and pandas in the Minshan and Qinling Mountains, China.

Case Study 4

Abstract

Examples from around the globe repeatedly emphasize that considerable losses in natural resource and ecological functions will eventually far outweigh short-term economic gains. The unprecedented speed at which China's economy is currently growing raises concerns over the obvious harmful environmental consequences from such phenomenal growth. Illustrating more sustainable models for rural and economic growth, as well as an evolving conservation approach, are projects for giant panda conservation in the Minshan and Qinling mountains of China. Supported by WWF, these projects are seeking to demonstrate viable partnerships between local communities and nature reserves, economic development and conservation goals – interest groups and aspirations that have conflicted with each other in the past. This case study illustrates how conservation projects for the giant panda have evolved to include pressing human concerns about the most populated nation in the world. Information from the projects, though still small-scale, indicates that they can become effective models of sound partnerships that engender both conservation and economic results.

1. The Context

In the last two decades, China's rapid economic growth and modernization has made it a global phenomenon. The country's economic development is seen as a huge success, with annual growth rates averaging nearly 10 per cent in the last 20 years (UNDP Human Development Report, 2002). Its Gross Domestic Product (GDP) growth rate in 2003 was an unrivalled 9.1 per cent. It is estimated that by 2020, China's GDP will have quadrupled compared to the year 2000 (Goldman Sachs, 2003). Economic growth in the country has meant improved living standards, though it is estimated that 8 per cent of the country's huge population of 1.27 billion still live below the poverty line. The downside of this amazing growth is that, if the current patterns of development are to continue, the country's natural resources will not be able to sustain it and the environment will have to bear the heavy burden of pollution and overexploitation. The World Bank concludes that pollution and environmental degradation cost China 8-12 per cent of its annual US$1.4 trillion GDP in direct damage. Immediate concerns for the country today are: ensuring sustainable growth; maintaining essential reserves of its natural resources; and achieving better living standards not only materially, but physically, in a healthy, clean environment.

The Minshan mountain range extends over the Sichuan and Gansu provinces. It has abundant biodiversity and is home to the largest giant panda population – about 500-550 individuals. Minshan covers parts of six counties and

The World Bank concludes that pollution and environmental degradation is costing China 8-12 per cent of its annual US$1.4 trillion GDP in direct damage.

19 nature reserves and is populated by close to 1 million Han, Tibetan, Qiang, and Baima people. WWF's main field project here is known as the Minshan Landscape Initiative. The Qinling Mountains have the second largest distribution area for the giant panda (up to 20 per cent of the wild panda population). WWF's project here is known as the Qinling Panda Focal Project and it is operating in an area with a population of 2.3 million (mainly Han people), 126 species of mammals, 338 species of birds, and 1435 species of insects have been recorded in this area. Besides the giant panda, other well-known species found in the two mountainous areas include the golden monkey, takin, crested ibis, golden eagle, clouded leopard, red panda, giant salamandar, and the golden pheasant.

Both the Minshan and the Qinling mountains act as water catchment areas for China's largest rivers — the Yangtze and the Yellow. They also play a crucial role in providing fuelwood and freshwater for local people. The Qinling Mountains are the only water source for Xi'an, China's ancient capital, which today has a population of over 7 million. The slopes of the Minshan and Qinling are among the few heavily forested areas still remaining in China. The forest cover in the Minshan Landscape is 51.53 per cent and covers an area of 19,370sq km (Minshan Landscape Conservation Project Report, WWF, 2003). The forest coverage in the Qinling Mountains is around 50 per cent (Qinling Conservation and Economic Development Project Report, WWF, 2004). Farming and animal husbandry are the dominant occupations. In Minshan over 80 per cent of local people are farmers. Local livelihoods and economy in both the mountainous areas have always been heavily dependent on the extraction of forest resources. Commercial logging was the main income source for many of the local people since the 1950s and 1960s, resulting in heavy deforestation. Recognizing how critical the mountains were as catchment areas for farmland irrigation and for drinking water to millions of people downstream, the Chinese government included these areas in the 1998 logging ban imposed in several provinces. This led to the loss of the chief source of income in a region where poverty remains entrenched. In 2000, the average annual net income per capita for farmers was below US$218 for the seven counties in Minshan, with one county reporting less than US$120 (Minshan Landscape Conservation Project Report, WWF, 2003).

Most of the forests in the mountains are state-owned — either designated as nature reserves or non-operational

In 2000, the average annual net income per capita for farmers was below US$218 for the seven counties in Minshan, with one county reporting less than US$120.

forest farms. The collection of fuelwood and non-timber forest products (NTFPs), together with timber felling, are illegal in these forests. Small community forests exist under township management and allow fuelwood collection for the locals. These lack management and are consequently heavily degraded. It is hardly surprising, therefore, that illegal fuelwood collection from the state-owned forests, as well as illegal logging and poaching, continue. The forested slopes provide one major legal source of income opportunity today and that is through recreational tourism. Domestic tourism to the nature reserves in these mountains has grown enormously in recent years. Among the most popular destinations are Jiuzhaigou and Wanglang Nature Reserves. Tourism to Jiuzhaigou – a World Heritage Site with beautiful natural wooded valleys – was actively promoted by the government. The nature reserve alone received 1,191,000 visitors in 2001 (WWF Report, 2001). While this trend has brought economic benefits to the region, unplanned, large-scale tourism is causing negative impacts by bringing with it pollution and exploitation of natural resources.

2. Securing the Future for People and Pandas

WWF was the first international environmental organization invited by the Chinese government in 1980 to support its giant panda conservation efforts. The country has made great strides since then for giant panda conservation. The first panda reserves were declared in 1965, and there are 33 today. A regional giant panda conservation network is in effect, and management in the protected areas has been greatly strengthened. To a large part, these successes are due to a flexible approach that has allowed the WWF Programme in the country, working with stakeholders, to evolve in response to the issues on the ground — particularly those concerning local communities and their needs, as these inevitably impacted conservation efforts. Effective management of giant panda habitat has meant addressing poaching and resource exploitation by the poor farming communities bordering the state-owned forests. Merely declaring these activities as illegal did nothing to curb them. It was soon realized that without responding to the livelihood needs of the impoverished farming communities, the giant panda and its habitat, and the natural resources of the area and their ecological functions, could not be protected.

In response to these complex and interlinked issues, WWF is helping to develop models of innovation and partnerships between local communities, government and the private sector. Interventions in Minshan began in 1997 with the Pingwu Integrated Conservation and Development Project (ICDP). The project has since become part of a much larger Minshan Conservation Initiative. The Pingwu ICDP was initiated as a pilot project that could be applied to other areas in Sichuan. It was envisaged because of the need to try and reconcile panda conservation with livelihood/development concerns. A participatory evaluation of the project, carried out in 2002, highlighted a number of weaknesses in the project that were valuable for future planning. There was inadequate analysis and understanding of the links between livelihood development and conservation, and of the complexities of trying to set up viable alternative livelihoods. Therefore, the end result was that the initiatives did not generate sufficient income. In addition, most of the alternative income generation activities initiated by the project were on a very small scale and could not show significant impacts. This still remains a limitation due to lack of capacity and funding. Since the Pingwu ICDP, the livelihood activities have been expanded in a major way but they are still relatively small-scale and fairly recently implemented. Therefore, as with this study, it is still difficult to show significant quantitative impacts.

The Qinling Panda Focal Project started more recently, in 2002. The Pingwu ICDP taught valuable lessons regarding the development of alternative income-generating schemes among rural people. The strength of the approach lies in the participatory processes used to consult the local people about their living conditions and aspirations. In both Minshan and Qinling, a series of participatory consultations and market assessments have been carried out to develop the livelihoods programme.

The government dominates the development of all sectors in China: be it conservation; industry; or infrastructure. In more recent years, with a more liberal policy and freer markets, this is slowly changing and independent forces are making their influences felt. WWF is assisting the nature reserves and forest farm authorities to build their capacities to work with local communities — a novel concept as these government bodies did not engage with local people in the past. At the same time, partnerships are being negotiated with the private sector and township governments to develop enterprises that are based on-farm, and sustainable natural resource use.

3. Initiatives and Results

3.1. Building Local Capacities for Sustainable Livelihoods

The Chinese government's logging ban and restrictions on resource use in the region were necessary to protect critical ecological functions. However, the ban did not help the already impoverished communities to better their livelihoods, as forest resources were their chief source of income. Since the 1950s, these communities had been heavily dependent on activities such as logging, mining and herb collection. Without alternative opportunities for income, the government-imposed control worked only to

WWF is assisting nature reserves and forest farm authorities to build their capacities to work with local communities. Partnerships are also being negotiated with the private sector and township governments to develop local enterprises.

a degree, and illegal logging, poaching, herb collection and cattle grazing in the reserves still continue. The WWF projects in the area are working to address this issue and build local capacities to follow sustainable and viable options, rather than continue activities that are illegal, exploitative and unsustainable. Training and technical assistance are being given to the nature reserves and former forest farms, as well as the township bodies, to develop their abilities to work with local people to help diversify their farm incomes. This approach builds the capacities of the government authorities as well as local communities, while simultaneously building bridges between players where there has been conflict in the past. The key to the effectiveness of this programme is the participatory consultations carried out in order to understand local conditions, aspirations, market demands, and resources. Training given for local capacity building includes improving skills, technologies, markets and services. Farm enterprises such as bee and mushroom farming, pig and goat raising, cultivating vegetables, fruit trees and herbs — along with ecotourism — are also being encouraged.

3.2. Diversifying and Marketing Farm Produce

Local people are encouraged to diversify their farm income through farm-based enterprises. Some of these activities are traditional and some are new to the area. WWF supports the training of the farmers and helps them with equipment and small grants. The conditions for disbursing these grants were developed through a participatory process. Households bordering the nature reserves, which are highly dependent on natural resources, are identified. Poor households are targeted and women are encouraged to apply. Since the projects began, 80 farmers have been supported to begin beekeeping, and 57 were assisted to start raising goats and pigs to supplement their farm earnings.

The panda conservation projects also supported around 235 farmers to cultivate non-timber forest products (NTFPs), such as apple trees, walnut and prickly ash pepper plants, and 102 farmers are cultivating medicinal herbs. Recently, two local farmers in Minshan have established nurseries that grow wild, edible ferns that are in popular demand from both the tourists and the locals themselves. They will supply saplings to other farmers interested in this venture. Vegetable gardening is also being strongly encouraged – 185 farmers have been helped to start or expand their vegetable plots to grow cabbage, radish, greens, etc. This has contributed to improving their nutrition, as well as providing means to supplement their incomes and improve their livelihoods.

With the help of WWF, three nature reserves have successfully negotiated a partnership between Carrefour (the supermarket chain) and local farmers, to supply organic products to the supermarket. The initial earnings from this venture between a period of three months, from October-December 2004, amounted to US$31,438. The cash went directly to the farmers.

Farm-based enterprises need to be linked to markets they can supply their products to. WWF is facilitating innovative partnerships between farmers, forest authorities, and private companies. Carrefour, a French company, has set up its supermarket stores throughout China. With the help of WWF, three nature reserves have successfully negotiated a partnership between Carrefour, local farmers, and themselves to supply organic products to the Carrefour supermarket chain. The nature reserves involved are Wanglung, Baihe and Baishuijiang. The nature reserve staff help farmers from communities adjacent to the parks to start up or expand the production of honey, mushrooms and prickly ash pepper. The products are then collected by the reserve staff and sold to an entrepreneur who supplies it to Carrefour supermarkets. All the products use the same brand to promote their saleability as organic products from natural areas. The initial earnings from this venture between a period of three months, from October -December 2004, amounted to US$31,438. The cash went directly to the farmers. WWF supported the nature reserves with related training to technically assist the local farmers. Training and equipment were also supported for the farming of organic products. About 70 households benefited from this programme in its first year of operation. Due to its success, the programme will be expanded in the coming years to reach more farmers.

Near the Foping Nature Reserve in Qingling, the flooding of the Han River, a tributary of the Yangtze, caused a major disaster in 2003, causing large-scale loss of lives and property. WWF supported the two villages of Xiaonanping and Yueba, who suffered heavily from the floods, to begin beekeeping and linked them to a private company to supply their honey. This has turned into a profitable venture with the honey being sold throughout Shaanxi province. The farmers are reportedly earning an annual income of US$120 per farmer (Z. Zhelin* pers.comm.*).

3.3. *Ecotourism is an Option*

The domestic tourism boom to Jiuzhaigou Nature Reserve was heavily promoted by the government. In 2001, over 1 million tourists visited the reserve, which brought obvious economic benefits to the local people. A WWF assessment carried out in Yazhe village, in Minshan, reports a co-relationship between alternative economic activities such as tourism and reduced dependence on natural resources. The graph below illustrates that income from tourism (from services providing accommodation, food and cultural programmes), and horse treks, have increased markedly. In contrast, herb collection and poaching have declined significantly.

Tourism can be a double-edged sword, however. If it is helping to reduce resource dependence in some areas, in others — particularly those with large-scale tourism such as Jiuzhaigou Nature Reserve — it is causing ever-increasing pressures on the same natural resources. Demand for fuelwood and timber for construction, demand and sale of animal parts, and pollution problems are increasing with escalating tourist numbers. "Ecotourism," or environmentally responsible tourism that benefits local communities, is an opportunity for taking economic returns to the local people and ensuring effective resource management. WWF is helping to build local capacities for ecotourism services in the Pingwu County of Minshan, as well as in the Qinling region where tourism is a more recent development.

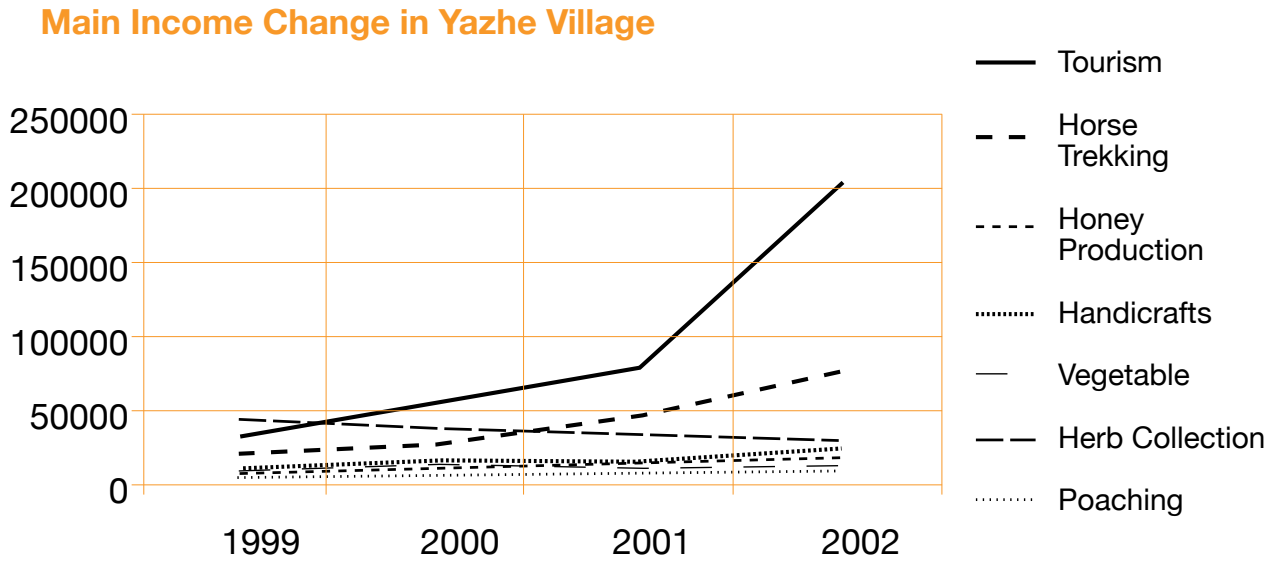
Locals are being trained on tourism enterprise and service development, hospitality, interpretation skills, and environmental protection. Support is provided to start up or upgrade services. For the ethnic Baima people of Pingwu, who live near the Wanglang Nature Reserve, community-based tourism has proved successful and provided an alternative income source to illegal logging activities. This has helped to resolve a serious conflict situation between the locals and the park authorities that existed prior to 1997, which is when the Pingwu ICDP was initiated in the area. Local people are involved in a variety of tourism activities such as home stays, horse treks, and cultural programmes that supplement their farming incomes.

To further increase local tourism facilities, the project supported the renovation of the Wanglang Nature Reserve headquarters to allow for expanded lodging facilities of up to 50 beds for tourists, and an "eco trail" was built in the reserve. Pingwu county is currently being assisted to upgrade their tourism services and apply for Ecotourism Certification from Green Globe Ecotourism Certification, Australia. An ecotourism expert has been contracted to develop the Ecotourism Plan for the Jiuzhaigou Nature Reserve. Ecotourism development for Baihe Nature Reserve is also being planned.

In Qinling, 60 households have begun homestay services with WWF support. Besides training to improve their services and sanitation, they were assisted to build toilets. This has had a wider impact by influencing other villagers to clean their surroundings and, if they can afford it, to build toilets attached to their homes. Home stays in southern Taibashein have become popular among domestic tourists and are reportedly earning around US$360 per annum. One homestay entrepreneur, Mr. Zin, earned as much as US$3628 in 2004 (L.Xiaohai pers. comm.). A total of 70 locals have been trained as guides and two local enterprises providing hiking services have started to operate in the area. Individuals who work as guides are normally from poorer households and this seasonal work will earn them US$10 per day, which will go to supplement their overall earnings. A convenience store and a restaurant catering to tourists in the area are also in operation with the project's help. Since Qinling is remote and accessibility is difficult, the project has even helped the community to buy a truck to transport necessary goods.

3.4. *Conserving Natural Capital*

The government has made significant progress in improving the national context for conservation, but the implementation of existing policies and laws is weak. This is largely due to the major emphasis being on economic development, compounded by deficiencies such as lack of funding, and poor capacity and infrastructure for conservation. One of the most significant outcomes of the first decade of cooperation between WWF and the Chinese government was the development of a management plan for the giant panda, which was adopted by China's State



Council in 1992. This National Conservation Programme for the Giant Panda and its Habitat (NCPGPH) called for the establishment of additional nature reserves, tangible improvements in the existing ones, and the creation of migratory corridors between isolated populations. The NCPGPH has been instrumental in the progress made in the establishment of new reserves and in the strengthening of capacities for conservation.

The 1998 logging ban imposed by the Chinese government was a positive development for conserving the forested slopes of the Minshan and Qinling mountains, thereby protecting its critical catchment functions as well as safeguarding the habitat of the giant panda. However, the quality of forest cover or habitat increase has not yet been monitored in the two mountainous regions. Almost all of the local people on the project sites are reliant on fuelwood for cooking purposes. They collect the fuelwood from their community forests, which have become heavily degraded due to poor, or in many cases, non-existent management. Local people are also illegally extracting fuelwood from the nature reserves and former forest farms. To address this, WWF is supporting the construction of energy efficient stoves and biogas reactors for the local farmers. In Minshan, 397 biogas reactors and 361 energy efficient stoves have been built. In Qinling, 120 efficient stoves have been completed. It is reported that traditional stoves use 60-100 cubic metres of fuelwood in a year — the efficient stove saves up to 30 per cent of this amount. Additionally, some local individuals are getting the opportunity to train as technicians and earn US$36 for each stove they build.

There are some indicators that large-scale logging and deforestation have halted and a slow — but nevertheless real — recovery is taking place, including: the imposition of the logging ban; the increase in protected area coverage; and increases in the giant panda population. The government has established 33 panda reserves that provide protection for over 60 per cent of the country's giant panda populations. Surveys carried out in the 1970s and the 1980s indicated that there were about 1100 giant pandas remaining in the wild. A third survey carried out more recently, between 1999-2002, indicates a higher figure of nearly 1600 (survey conducted by the State Forestry Administration and Sichuan Forest Department). This involved more sophisticated survey techniques (which discovered that there were 40 per cent more pandas than were thought to exist).

Exemplifying the WWF approach in species conservation, WWF's support for giant panda conservation today applies a broad-based and integrated approach. These include:

- Assisting local communities and government institutions (nature reserves, former forest farms and township governments) to address and develop win-win solutions for conservation and economic development. This includes building the capacity of local farmers to develop sustainable options to increase their farm and off-farm income

- Capacity building of the government institutions for park management, poaching control, and research. Training courses for guards, scientists, and managers are supported, together with equipment and veterinarian services

- Biodiversity monitoring in nature reserves and forest farms. These include monitoring of the giant panda and its habitat, as well as monitoring other species such as the musk deer, takin, black bear and bird species

- Upgrading provincial afforestation standards (used by nature reserves, forest farms, community forests, and privately leased forest land) to include biodiversity conservation and monitoring guidelines.

4. Sustainable Rural Growth though Partnerships

Exploring innovative partnerships to deliver and showcase sustainable models of rural economic growth is one of the main objectives of the panda conservation projects. The partnership of the three nature reserves of Wanglung, Baihe and Baishuijiang with local farmers and a private entrepreneur to successfully market organic produce to the supermarket Carrefour, is one example that demonstrates the possibilities of sustainable models for rural economic growth.

WWF's partnership with the World Bank's International Finance Corporation (IFC) in the Minshan landscape is another opportunity for developing sustainable models for improving rural income and livelihoods. IFC is part of the World Bank Group. It fosters economic growth in developing countries through private sector investments, mobilizing capital in the international financial markets, and providing technical assistance and advice to businesses and government. It is the world's largest multilateral organization providing assistance directly in the form of loans and equity to private enterprises in developing countries. Under the WWF and WB/IFC partnership in Minshan, feasibility studies have been carried out and a programme will be initiated that will provide small grants to develop community enterprises, based on market demands for produce such as honey, walnut, prickly ash pepper, medicinal herbs, etc. A grant of up to US$5000 for one enterprise can be provided, along with technical assistance to local farmers.

Innovative partnerships for effective management that benefit local livelihoods rather than marginalize them are needed for the co-management of vast tracts of land that link protected areas to each other. Known as corridors, the conservation and management of these areas are necessary to link isolated populations of giant pandas and other species. These corridors allow their dispersal, and that of other species, which is crucial for their long-term conservation. The Huangtuliang corridor extends over the provinces of Gansu and Sichuan, linking three nature reserves (Wanglang, Wujiao, Baishuijiang) and one forest farm. A major circuit road goes through this area, which has heavily degraded forests due to past logging operations. Effective management can only be achieved through real cooperation and communication between the government authorities, the local people, and the private sector. WWF has facilitated agreements between these various groups for developing income-generating schemes, alternative energy use and the control of poaching, logging and illegal herb collection. To implement the agreement, co-management committees are formed which are typically comprised by the village headman, representatives of the village, and officials of the township or forest sector.

5. Lessons Learnt

Protecting water catchments, which in this case are the habitat of the giant panda, is of vital importance to the millions of people who live downstream. However, this invariably restricts local people from resource use that has traditionally supplemented their incomes and livelihoods. To balance this loss to local communities, it is necessary to have a holistic conservation approach and develop alternative opportunities for enhancing their livelihoods. The continued incidence of poaching, illegal logging and illegal herb collection by impoverished farmers, even after the imposition of bans, taught a significant lesson to the giant panda conservation approach — that it is necessary to effectively address human needs to achieve conservation results.

The Pingwu ICDP in Minshan taught valuable lessons regarding the integration of livelihood concerns and the implementation of income-generating schemes. This aspect of the project suffered in its early years from a lack of adequate analysis and understanding on the links between livelihood development and conservation, as well as on the complexities of trying to set up alternative livelihoods. This experience was instrumental in helping to develop a programme that is participatory and ensures that alternatives are appropriate and acceptable to the target groups. Equally important is the need to link the income-generating schemes to existing or new markets and ensure that adequate technical assistance and extension are made available to build local capacity. However, many of the alternative income-generating activities being implemented are still on a small scale, because of a lack of capacity and adequate funding. As this study found, due to the small scale of the activities, it is difficult to show improvements on livelihoods or significant impacts to conservation. There is need to scale up and expand the activities, together with ensuring that effective monitoring and evaluation is carried out.

Regarding tourism development, greater efforts need to be made to pre-empt the negative impacts of uncontrolled mass tourism, some of which are already becoming apparent. Given the fact that mass tourism to Pingwu and the nature reserves of Wanglang and Jiuzhaigou is already established, it would be inappropriate to ignore this and focus instead on an exclusive “high-end” ecotourism market that may take a long time to reach adequate levels. It is possible to change the behaviour of the tourists and establish eco-friendly practices through campaigns, awareness, and education. Therefore, mechanisms need to be developed to manage and work with the large numbers of domestic tourists already visiting the area. The existing environmental regulations need to be reviewed, coordinated with relevant departments, and enforced effectively.

Another key lesson learnt was the need for partnerships among the stakeholders involved. Partnerships among the various interest groups are necessary to achieve long-term results in conservation and sustainable rural economic growth. Strengthening the government institutions in the region to work with local communities offered opportunities to use available human resources and explore domestic funds while helping to resolve conflicts. Involving the private sector gave opportunities to tap into their resources for developing markets and capacities that are environmentally sustainable. This also offered lessons to the private sector — for viable eco-friendly alternatives to their usual business approach, which is usually focused singularly on capital gains. The projects in Minshan and Qinling indicate that partnerships between the local people, the forest authorities, and the private sector strengthen conservation management while offering opportunities for exploring economic benefits.

Giant panda habitat. Qin Ling Mountains, Shaanxi Province, China.
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Case Study Five:
Sea Turtle conservation in Tortuguero, Costa Rica.

Case Study 5

Wildlife use is common in Costa Rica. Sea turtle use is important in several coastal communities, with non-consumptive use as a tourism attraction now the most prevalent. Illegal consumptive use is also widespread.

Abstract

Sea turtle conservation efforts in Tortuguero, Costa Rica, began in the 1950s. Legislation protecting sea turtles and creating the Tortuguero National Park in the 1960s and 1970s caused the village economy to change from natural resource exploitation, to an economy based on nature tourism. Initially, living standards declined and the human population decreased – but once wildlife tourism grew, these changes were reversed. Education and health services available to the local population have improved, and increased employment opportunities have stimulated human population growth. It should be acknowledged that some negative impacts from tourism include an increase in solid waste and sewage production, prostitution, and a rise in drug and alcohol abuse. Green turtle nesting increased by an estimated 417 per cent between 1971-2003. Several species conservation and human development goals have been achieved in Tortuguero. It is clear that of the two realistic development options available – natural resource extraction, or species conservation/tourism – the latter has provided more benefits than the first could have done; both to an endangered species and to the local community.

1. The Context

Costa Rica, a country covering 51,100sq km, is located in Central America. The major economic sectors include exports by the high technology electronics industry, tourism, and agriculture: mainly bananas; pineapples; coffee; oranges; mangoes; melons; and papayas (Programa Estado de la Nación, 2004). The number of foreign visitors to Costa Rica increased from 435,000 in 1990, to over 1.2 million visitors in 2003. Tourism generated US$1.2 billion in 2003 (Programa Estado de la Nación, 2004). During the last decade, unemployment has been relatively low and stable, with an open unemployment rate of 4.2-6.7 per cent (Programa Estado de la Nación, 2004). In 2000, the average length of education for people more than 25 years old was 7.4 years. Five per cent of people more than 12 years old were illiterate (Programa Estado de la Nación, 2004). Costa Rica has one of the highest Human Development Index (HDI) values of Latin America (Programa Estado de La Nación, 2004). The National Institute for Statistics and Census (INEC) has developed additional development indicators including: the Social Development Index; the Social Lag Index; and the Basic Needs Not Satisfied Index, to measure access to services and to identify socio-economic disparities within the country. HDI values vary between Costa Rica's 81 cantons; with the area around the capital San Jose and nearby Heredia having higher values than rural areas (Programa Estado de la Nación, 2004). The cantons with greater socio-economic development are those that are small and heavily populated, and where the head of the household has had more than eight years of education (Programa Estado de la Nación, 2004). Incomes and electricity use are higher in these cantons (Programa Estado de la Nación, 2004). Areas close to the borders with Nicaragua and Panama, with low population densities, have the highest Social Lag Index values (Programa Estado de la Nación, 2004). The inequality in incomes increased between 1990-2003 but remains one of the two lowest in Latin America (Programa Estado de la Nación, 2004).

Tortuguero village is in northeastern Costa Rica, on the Caribbean coast. Access to the village is limited to boats and small airplanes. Tortuguero is located in Pococi canton, which ranks 58th out of 81 cantons in terms of HDI, 66th out of 81 in the Social Development Index, and 68th out of 81 in the Social Lag Index (Programa Estado de la Nación, 2004).

In 1985, the human population of Tortuguero village was approximately 150 people divided into 29 households. A large proportion of the residents were of Afro-Caribbean origin; many of whom spoke Caribbean Creole (Place 1988; Lefevre, 1992) By 1990, the human population had increased to 211 residents (Lee & Snepenger, 1992), in 2000, Tortuguero had 526 inhabitants (INEC pers. comm.). Historically, the main economic activity in Tortuguero was the exploitation of meat and eggs from the area's nesting green turtles (*Chelonia mydas*) (Place, 1988). Later, in the 1940s-1960s, the lumber industry became the most important employment sector (Place, 1988). Nature tourism began in the mid-1980s and is now the source of employment and income for the vast majority of residents. Today, 40 per cent of the population was born in Pococi canton, with those of Nicaraguan origin making up 32 per cent and those born in other cantons of Costa Rica representing 27 per cent of residents (INEC pers. comm.). One per cent of inhabitants originate from countries other than Costa Rica and Nicaragua (INEC pers. comm.). Afro-Caribbean people are the largest ethnic minority,

and represent 17 per cent of the population (INEC pers. comm.).

Costa Rica's location is on the narrow land bridge that connects North and South America and separates the Caribbean Sea from the Pacific Ocean. The country has a a wide variety of habitats, and high species diversity. So far, 90,000 species have been recorded in Costa Rica (including 1,780 species new to science), representing 17 per cent of the expected biodiversity of the country (Programa Estado de la Nación, 2004). Costa Rica has a long history of conservation efforts — 25.6 per cent of the land territory is now under state protection. An additional 8 per cent of the total territory is privately protected (Programa Estado de la Nación, 2004). Wildlife use is common in Costa Rica. Sea turtle use is important in several coastal communities, with non-consumptive use as a tourism attraction now the most prevalent. Non-consumptive use of sea turtles occurs in Tortuguero, Parismina, and Gandoca on the Caribbean coast, as well as Tamarindo, and Matapalo on the Pacific coast. Illegal consumptive use is widespread. There is a managed collection of olive ridley (*Lepidochelys olivacea*) eggs at Ostional, where there is still a legal consumptive use of sea turtles (Legislative Assembly, 2002).

Tortuguero village is surrounded by protected areas, most importantly Tortuguero National Park (made up of approximately 31,187ha terrestrial areas and 50,100ha marine areas), and Barra del Colorado Wildlife Refuge (81,211ha) (SINAC, 2005). Both these areas form part of the northeastern Caribbean RAMSAR site. Tortuguero National Park consists of very humid tropical forests and wetlands. The national park is most famous for the beach that hosts nest sites for four sea turtle species: green (*chelonia mydas*); leatherback (*Dermochelys coriacea*); hawksbill (*Eretmochelys imbricata*); and loggerhead (*Caretta caretta*). All four species are classified as endangered or critically endangered (IUCN, 2004). The Tortuguero green turtle rookery is one of the largest in the world (Troëng & Rankin, 2005). The leatherback rookery forms part of the fourth largest population in the world (Troëng *et al*., 2004). In addition, the national park hosts 55 species of fishes, over 350 species of birds, and 140 species of mammals (Boza & Mendoza, 1981).

2. Wildlife and People Linkages

Natural resources and wildlife have been central to inhabitants of the Tortuguero area. In the 1880s, the major economic activity was the collection of natural rubber (Bovallius, 1888). Later, selective logging of tropical hardwoods became the pillar of the local economy, resulting in a quadrupling of the human population (Place, 1988). The first sawmill was built in the 1940s and operations continued until 1964 (Lefevre, 1992). Small-scale local logging continued until the creation of Tortuguero National Park. When the logging operations closed and many people lost their jobs, some people began hunting large cats for their skins to make money. The creation of Tortuguero National Park in 1970 (Government of Costa Rica, 1970) resulted in legal protection for large cats but hunting continued for some years (E. Chamorro pers. comm.).

Green turtles from feeding grounds throughout the Caribbean migrate in order to breed in coastal waters. Female turtles later emerge on the beach to lay their eggs. Hunters can easily render nesting turtles helpless by turning them on the beach. Mating turtles float close to the surface, making them easy prey to harpoon fishermen. Indigenous people probably caught turtles at Tortuguero before the 1500s. European sailors came to Tortuguero for nesting turtles as early as the 17th century. In the 20th century, the Limon municipality leased the beach and turtles were turned and later sold at local markets, or exported to the United States or Europe. Boats from the Cayman Islands turtle fleet would sometimes come to Tortuguero to stock up on green turtles (Carr, 1956). Green turtles were also caught for local meat consumption. Due to protective legislation and enforcement, consumptive use of turtles became a negligible economic activity in terms of employment and income by the mid-1980s (Place, 1988).

Conserving sea turtles benefit people

With the creation of Tortuguero National Park in 1970, many of the natural resources used by people became off-limits (Place, 1988). Although the human population had already declined as a result of the cessation of logging, a further decline of 2.2 per cent occurred between 1973-1984, probably due to the lack of economic opportunities (Place, 1988). The national park contributed to a decline in farming through expropriation of land, which was only partly offset by creating alternative employment as park staff (Place, 1988). By 1985, unemployment was still very high (Place, 1988). The tourism potential of the area had been noted when the National Park was created in 1970 (Government of Costa Rica, 1970). However, visitation to the national park was very limited in the 1970s. As a result, the local residents' standard of living declined in the decade after the park's creation (Place, 1988). Then tourism began to grow rapidly in the mid 1980s. In 2004, a total of 80,319 tourists visited the national park (ACT pers. comm.). In 1990, almost 90 per cent of tourists stated that they visited Tortuguero to observe plant and animal species, especially sea turtles (Lee & Snepenger,

In 1990, almost 90 per cent of tourists stated that they visited Tortuguero to observe plant and animal species, especially sea turtles (Lee & Snepenger, 1992).

1992). The green turtle nesting season during June-October is outside the country's main tourism season. However, nesting green turtles attract enough visitors to effectively provide a second high season in Tortuguero. Tourism growth has generated employment and income opportunities and has reversed the human population decline as people migrate from adjacent communities and neighbouring Nicaragua. In 2000, Tortuguero had 526 inhabitants (INEC pers. comm.). But this is most probably an underestimation of the real population size (S. Troëng, pers. obs.).

Caribbean Conservation Corporation's role and project information

Caribbean Conservation Corporation (CCC) has undertaken sea turtle research and conservation efforts in Tortuguero since 1959 (Carr *et al.,* 1978). As a result of the conservation efforts, protective legislation limiting the taking of turtles and eggs from the beach was passed in 1963 (Government of Costa Rica, 1963). In 1969, the export of calipee, the green body fat used as the main ingredient in turtle soup, was banned (Government of Costa Rica, 1969). The removal of green turtles in waters off the nesting beach was further restricted by presidential decree in 1970 (Government of Costa Rica, 1970) and law in 1975 (Legislative Assembly, 1975). Locals were permitted to remove a couple of green turtles per week until the early 1990s. Fishermen from the port of Limon, 80km south of Tortuguero National Park, were also allowed an annual catch of 1,800 green turtles until early 1999. Concerns that illegal hunting was contributing to catches that vastly exceeded the legal quota caused environmental groups to bring a lawsuit that resulted in green turtle fishing being outlawed (Costa Rican Fisheries Institute, 1999). In 2002, a new sea turtle law banned all consumptive use of green turtles and established harsh penalties for those who illegally hunt sea turtles (Legislative Assembly, 2002). The economic importance of sea turtle tourism was used as a major argument when promoting the approval of the new law (S. Troëng, *pers. obs*.) The presence of park rangers, CCC scientists, tour guides and tourists on the nesting beach deter the illegal removal of turtles and eggs, and facilitates reports of such activities to the authorities. Conservation efforts at Tortuguero have contributed to an estimated increase by 417 per cent in green turtle nesting between 1971-2003 (Troëng & Rankin, 2005). The impacts of increased tourism visitation on other wildlife are unknown. The deforestation rate within Tortuguero National Park was negligible during 1960-1997 but deforestation in a 10km buffer zone outside the park increased during the same time period (Sánchez-Azofeifa *et al*., 2003).

CCC operates a field station in Tortuguero and has a country office in San José, in addition to its international headquarters in Gainesville, Florida, USA. CCC's efforts in Tortuguero focus on sea turtle research and monitoring but the organization also plays an active role in many development and management issues. For example, CCC organized the first tour guide training course in 1990 (Jacobsen & Robles, 1992). Until the early 1990s, CCC provided significant local employment during the green turtle nesting season (Place, 1988). Increased job opportunities in the tourism sector, and the use of volunteers for the turtle patrols, have reduced the importance of CCC as a local employer but CCC remains involved in local development and conservation issues. (More information is available at http://www.cccturtle.org).

Participatory processes

The Tortuguero National Park was created without consultation with the local communities. Since then, local interests and concerns have become more important to the Ministry of Environment and Energy, which manages the national park. Public use regulations now allow certain activities within the national park. The regulations are revised on a regular basis and committees with representatives from the Tour Guide Association, the Development Association, the Women's Association, and small business and hotel owners are often set up to deal with issues such as changes in the turtle observation system, solid waste treatment, and transportation.

The increase in public use of the national park can be illustrated by the tour guide training programme, initiated in 1990 to minimize the tourism impacts on nesting green turtles and to provide local people with alternatives to consumptive resource use. Eight participants completed the first training course (Jacobsen & Figueroa, 1994). In 1993, a total of 83 people participated, and in 1999 and 2001, the tour guide training courses were attended by 136 and approximately 100 people respectively (Peskin, 2002 pers. obs.).

3. Initiatives and Results

3.1. Building Livelihood Assets

Tourism to watch nesting sea turtles and other wildlife in Tortuguero National Park increased from 226 visitors in 1980 to 80,319 visitors in 2004. In 2004, a total of 31,655 permits were issued for sea turtle walks. A turtle tour costs between US$5-US$25 (S. Troëng *pers. obs*.). Although the number of visiting tourists has increased dramatically, the proportion of tourists in Costa Rica who visit Tortuguero has decreased from 16 per cent in 1997 to 8 per cent in 2001. (Costa Rican Tourism Institute, 2002; cited in Morera, 2004). Tourist spending in Tortuguero has increased from an average of US$154 in 1990 (Jacobsen & Robles, 1992)

Local tour guides have supported the construction of a playground, housing for the teachers, a police station, a sports court, a kindergarten, and a daycare centre, as well as pipes for the public water system, and provided funds to repair and maintain the school and high school buildings (E. Obando pers. comm.).

to US$236 in 1998 (Costa Rican Tourism Institute, 2000), to US$255 in 2002 (Costa Rican Tourism Institute pers. comm.). In 2002, gross revenue of sea turtle tourism in Tortuguero was estimated at US$6,714,483 from board, lodging, and transportation services, as well as souvenir sales, national park and guided tour fees (Troëng & Drews, 2004).

The increase in visitation has contributed to an increase in the hotel and cabina (hostel) infrastructure. In 1985, just one hotel with 12 rooms and two rustic cabinas operated in Tortuguero (Place, 1988). In 1990, the maximum hotel capacity was 287 people per night (Jacobsen & Figueroa, 1994). Today, there are 11 hotels and 18 cabinas, with an estimated 599 rooms (Harrison *et al.*, 2005). The hotels have greater room capacity than the cabinas. Local residents do not own hotels, but the majority of cabinas have local ownership. The cabinas has increased from 12 in 2001 to 18 in 2004, while the number of hotels has remained the same during this time period.

Human population growth has contributed to an improvement in government services available to local residents, although the quality of these services is still below those provided in central Costa Rica. In 1990, sixth grade was the highest level of education available in Tortuguero (Lee & Snepenger, 1992). A secondary school opened in 1999 and students can now continue their education for three out of the five years of secondary school (E. Obando pers. comm.). The availability of health services has also improved. In 1990, the village health centre was only open two days a month (Lee & Snepenger, 1992). Today, the health centre is open two days a week. The Costa Rican Social Security system only provides a permanent doctor for communities with more than 2,500 inhabitants (E. Obando pers. comm.). In terms of other services there have been some improvements. In 1990, there was no garbage collection, public water or sewage system available (Lee & Snepenger, 1992). A public water system is now available in Tortuguero. A solid waste treatment plant has been built, but no sewage system exists. Increased human population and visitation has resulted in a large increase in solid waste and sewage. The system currently in place for solid waste treatment is inadequate and an improvement is urgently needed. One hotel experimented with sewage treatment but septic tanks remain the predominant method for the disposal of sewage. Tourism has also contributed to problems like prostitution, and an increase in drug and alcohol abuse.

Since 1994, most tour guides have made a small donation to a communal fund for each tourist they sell a guided walk to, to observe nesting sea turtles. Each year, upon completion of the green turtle nesting season, the guides decide which community project to support with the collected funds. The tour guides have supported the construction of a playground, housing for the teachers, a police station, a sports court, a kindergarten, and a daycare centre, as well as pipes for the public water system, a fence for the garbage treatment facilities, and provided funds to repair and maintain the school and high school buildings (E. Obando pers. comm.).

In 2002, gross revenue of sea turtle tourism in Tortuguero was estimated at US$6,714,483 from board, lodging, and transportation services, as well as souvenir sales, national park and guided tour fees (Troëng & Drews 2004).

3.2. Building Livelihood Strategies

Tour guides, hotel owners, tour operators, boat captains, hotel employees, local hostels, and small business owners benefit directly from sea turtle tourism in Tortuguero (S. Troëng pers. obs.). In 2004, the hotels and cabinas had an estimated 599 rooms (Harrison *et al.,* 2005). At 0.6 direct jobs per room (Costa Rican Tourism Institute pers. comm.), the number of jobs generated by tourism can be estimated at 359.

The tour guides represent a section of the Tortuguero community that receives considerable economic benefits from sea turtle tourism. Before 1990, few regulations governed human activity on the nesting beach (Jacobsen & Figueroa, 1994). In March 1991, it was decreed that tourists could only visit the beach if accompanied by trained tour guides (Jacobsen & Figueroa, 1994). There are 235 tour guides with licenses to conduct sea turtle tours. In 2000, local guides represented only 31 per cent of all guides but they conducted 72 per cent of the sea turtle walks in 1999 (Peskin, 2002). Distribution of turtle walks permits among local guides was not highly unequal (Peskin, 2002). A large majority of local guides (95.1 per cent) believe the economic benefits from tourism activities are not evenly distributed. However, the great majority of guides (95.1 per cent) agree that international tourism is improving the quality of life and 92.7 per cent believe tourism has significantly increased their income. The participation of women guides has also increased. In 1990, all 18 tour guides working in Tortuguero were male (Jacobsen & Robles, 1992). In 2000, 19.5 per cent of local tour guides were women (Peskin, 2002). Female guides were significantly more likely to believe working as a guide helps support their family than the male guides (Peskin, 2002). In 2004, a pilot system aimed at further reducing the impact of tourism visitation on nesting turtles was implemented. Hotel and cabina owners provided funds to employ turtle spotters to patrol the beach and inform guides of the location of nesting turtles. The system

Economic benefits are part of the reasons locals support of turtle conservation and tourism. In 1989, 100 per cent of residents agreed with the statement: "It is good that the park is protected", (Brown, 1991; cited in Jacobsen & Robles, 1994), and in 1990, almost 90 per cent of households said tourism was good for the community (Lee & Snepenger, 1992).

"After the National Park formed in Tortuguero in 1975…we support ourselves from tourism…What we do is take out people, show them the jungle, forest, birds, mammals, reptiles, whatever, so it is really easier for our generation…because what we do now is support ourselves off of sightseeing, wildlife, or whatever we have here."
- Eddy Rankin, a local tour guide from Tortuguero, Costa Rica.

allowed guides and tourists to access the beach close to a nesting turtle instead of searching for turtles, which can potentially scare off females that have not yet nested. The pilot system provided direct employment to seven local residents.

Comparing rural and coastal communities in Costa Rica, analysis can reduce the confounding factors to explain the differences in local development. Comparison between Tortuguero and Ostional, a site in Pacific Costa Rica where sea turtle eggs are used consumptively, suggests that non-consumptive use generates much greater revenue than consumptive use, both in terms of gross revenue and local benefits. Hope (2002) estimated that members of the Ostional Development Association earned on average US$70-US$100 per month in 2000, from the collection and sale of turtle eggs. In Tortuguero, tour guides can make as much as US$100 for each sea turtle tour. Peskin (2002) estimated that each local tour guide provided walks to 351 tourists in 1999. At a rate of US$5-US$10 per tourist, each tour guide earned US$1,755-US$3,510 during the five-month nesting season. Many tour guides also do other jobs such as provide canal tours; hence the estimated income only represents part of their total income. Since 1999, there has been an increase in the number of tourists taking turtle tours and, therefore, the tour guides are likely to be earning more today. Comparison of social development in Tortuguero, Ostional, and Barra del Colorado, a coastal community without sea turtles but similar to Tortuguero (rural, isolated, on the Caribbean coast), shows that Tortuguero had a lower value for Basic Needs Not Satisfied and hence greater social and economic development.

Table 7. Basic Needs Not Satisfied (NBI) for Some Coastal Costa Rican Communities

Community	*Sea Turtle Use in 2001*	*Proportion of Population with Basic Needs Not Satisfied (NBI*)*
Barra del Colorado	none	41%
Ostional	egg sales	39%
Tortuguero	tourism	28%

**Higher value indicates less social and economic development. Source from INEC.*

The transition from a natural resource use economy to tourism has drastically improved economic circumstances and marginally improved education and health services, but there is variation in terms of how residents have been able to access the new economic opportunities. Those with access to capital and able to adapt to the monetary economy have received more benefits, while those without capital and with little education have to make do with more menial jobs in hotels and other tourism businesses (Barrera, 2003).

Sea turtle conservation in Tortuguero – with the resulting increase in green turtle nesting – has provided added benefits to coastal dwellers elsewhere. Large numbers of green turtles are hunted for food and domestic commerce by residents in Caribbean Nicaragua (Lagueux, 1998). The majority of green turtles caught in this fishery come from Tortuguero (Bass *et al*., 1998). The sustainability of the fishery is questionable (Lagueux, 1998) but it is clear that without the long-term conservation efforts in Tortuguero it is unlikely that the fishery could be maintained at current levels. Also, green turtles feed mainly on sea grasses and algae. Sea grass beds are among the world's most highly productive marine ecosystems. Green turtles help to maintain sea grass beds and make them more productive. Without green turtles, sea grass blades grow tall and sediments that shade light and generate disease can build up. With green turtles feeding on the sea grass, the plants are kept short thus preventing sediment build-up. Also, sea grass consumed by green turtles is rapidly digested and becomes available as nutrients to other species of animals and plants in the sea grass ecosystem.

Hope (2002) estimated that members of the Ostional Development Association earned on average US$70-US$100 per month in 2000, from the collection and sale of turtle eggs. In Tortuguero, tour guides can make as much as US$100 for each sea turtle tour.

3.3. Forging Partnerships

Tortuguero village remains remote and relatively small, which reduces the interest and ability of government agencies in playing an active role in the area. The Ministry of Environment and Energy (MINAE) is the only government agency with a permanent presence. Other local and national government agencies visit sporadically. Still, many do contribute to conservation and local development. MINAE, in collaboration with CCC, the National Learning Institute, and the Costa Rican Tourism Institute, provide regular tour guide training courses for local residents and outsiders.

Further south, the community of Parismina has observed the economic opportunities resulting from sea turtle conservation in Tortuguero. In 2001, they initiated their own sea turtle conservation project with the assistance of the Costa Rican Coastguard. The leatherback turtle population nesting at Parismina is shared with Tortuguero and other nearby nesting beaches (Troëng *et al*., 2004). Therefore, the conservation project in Parismina is complementary to the Tortuguero efforts.

4. Lessons Learnt

This case study shows that long-term conservation action on sea turtle nesting beaches can reverse nesting declines and simultaneously contribute to the development of nearby communities. Comparisons with communities that chose to continue natural resource extraction suggests that species conservation provides greater benefits over time. It is clear that benefits from sea turtle conservation may not be immediate and, in the short-term, a reduction in natural resource use may result in local economic decline. Benefits from species conservation will gradually increase and, over the long-term, both economic and social development goals may be achieved. For this reason, it is wise to avoid creating elevated expectations for immediate, large-scale benefits. Rather, the strategy should aim for gradual improvements over time and perhaps recognize that certain sectors of the community will benefit more than others.

Some local residents and some outsiders from other parts of Costa Rica and Nicaragua have been able to take advantage of the transition from natural resource use to tourism, while others have benefited less. Although it would be desirable for everyone to benefit equally from tourism, such expectations are unrealistic. Significantly, the involvement and enterprise of outsiders has been critical in increasing tourism visitation to Tortuguero since 1985 (Place, 1988).

The direct and obvious connection between sea turtle conservation and the income received from tours to observe nesting turtles has been critical in order to generate local support for conservation action and regulations. The concept of a sea turtle being worth more alive than dead has been useful in gaining support for sea turtle conservation — both locally and nationally. Controlling access to the beach and only allowing observation of nesting turtles along part of the beach, and only when accompanied by licensed tour guides, ensures economic benefits to guides as well as minimizing the ecological impact of tourism by limiting visits to a small section of the nesting beach.

The economic benefits of sea turtle conservation are very apparent, while education and health services have improved only marginally. Increased job opportunities and incomes have contributed to human population growth. Greater population and incomes have meant an increased standard of living for Tortuguero residents, but tourism has also contributed to problems like increased solid waste and sewage production, prostitution, and a rise in drug and alcohol abuse.

Species conservation and associated local development in Tortuguero began in the 1950s and continues to evolve today. So far, the conservation goals of several species have been reached as have human development goals. It is very clear that of the two realistic development options available to Tortuguero – natural resource extraction and species conservation/tourism – the latter has provided more benefits than the former could have done — both to the endangered species and to the human population (Troëng, 2004). The Tortuguero case study provides useful lessons for other communities and projects aiming to conserve endangered species while also achieving local development.

Turtle tour, Tortuguero. © WWF

Case Study Six:
Conserving the Ganges River dolphin and improving livelihoods in Uttar Pradesh, India.

Abstract

Villagers in northern India who live along the sacred Ganges River report that improvements in their livelihoods have been made possible through conservation initiatives for the survival of the Ganges River dolphin (Platanista gangetica). The following case study focuses on Farida village, in Uttar Pradesh, where a study was conducted in order to better understand the linkages between conservation initiatives and sustainable livelihoods. The specific objectives of the study included: quantifying the changes in livelihood assets; examining the effect of conservation initiatives in developing livelihood strategies; and understanding its contribution in enabling good governance. The results indicate that the conservation programme has contributed to dolphin conservation while simultaneously building the capacity within the village to improve the standard of living. As a result, the livelihoods of villagers have been significantly enhanced in terms of employment and livelihood assets, local governance has been strengthened, there have been improved measures to secure water quality, and advancements have been made in gender equity and health. Villagers are becoming increasingly better informed, and therefore better able to utilize government schemes created to improve livelihoods. Furthermore, their ability to demand good governance is helping to ensure the successful implementation of these schemes.

1. The Context

India is home to 20 per cent of the world's population; more than 1 billion people in total. The country has a current GDP of US$692 billion and has emerged as the tenth largest economy in the world (World Bank, 2005). The nation succeeded in reducing the percentage of the population that is living below the poverty line from 36 per cent in 1990 (320 million) to 19 per cent in 2000 (260 million) (Asian Development Bank, 2003). Half of the poor are concentrated in the States of Uttar Pradesh, Bihar, and Madhya Pradesh, where the pressures on natural resources are higher. The majority of the poor in these areas are people who depend closely on nature for survival.

India is one of the 12 mega-biodiversity countries in the world — with 45,000 species of flora and 81,000 species of fauna identified within its borders. India is committed to the conservation of its environment, forests, and wildlife, as demonstrated through strong constitutional provisions, policies, and legal foundations to protect biodiversity. The challenge India now faces is to conserve this enormous biodiversity, while simultaneously using its natural wealth to improve the standard of living (MoEF, 2002).

The Ganges (known in the sub-continent as the "Ganga") Basin is the largest river basin in India, with a geographical area of 861,404sq km. It is a source of livelihood for over 450 million people (40 per cent of India's population). The river carries with it a huge amount of fertile silt, and the floodplains it creates are some of the richest agricultural areas in the sub-continent. However, habitats in the Ganges River Basin are threatened by significant anthropogenic pressures, such as water abstraction, urban development, and land use changes (Haque, 1976; Gupta, 1986; Ghosh, 1991). Additionally, the Basin has witnessed unprecedented levels of pollution and deterioration of aquatic habitats due to the unsustainable exploitation of aquatic resources. The activities required to meet the basic needs of the increasing number of people living in the basin have further deteriorated the water quality and aquatic biodiversity.

The Ganges River dolphin (*Platanista gangetica*), an endemic, truly aquatic mammal found in the Ganges-Brahmaputra-Meghna river systems, is one of only four species of freshwater dolphin in the world. It is listed by IUCN as "Endangered" and included in Appendix-II of CITES. In 1982, the dolphin population in India was estimated to number between 4,000-5,000 individuals, but is now estimated at less than 2,000 individuals (WWF, 2005); with an annual mortality rate of around 130-160 animals (Gupta, 1986). Continuing developmental pressures, the absence of coordinated conservation planning, almost no protected areas for the species, and a lack of awareness about the threats faced by the dolphins mean that population numbers continue to decline (Rao, 1995).

WWF India identified the Ganges River dolphin as a species of particular concern, thus initiating the Ganges River Dolphin Conservation Programme in 1997. The programme conducted the first ever scientific status survey of the species in India (in collaboration with network partners), is undertaking education and awareness programmes for fishermen and other riparian dependent human populations, and has formulated a Strategy and Action Plan for the Conservation of the Ganges River Dolphin for the State of Uttar Pradesh (with the help of the implementation agency — The State Forest Department). An effective network for the conservation of the Ganges River dolphin in India was also established and the programme has helped focus media attention on the species and its conservation.

The Ganges River Basin is the largest river basin in India, with a geographical area of 861,404sq km. It is a source of livelihood for over 450 million people — 40 per cent of India's population.

2. Links between Local People and the River Dolphins

The Ganges-Brahmaputra-Meghna river system runs through one of the most densely populated areas in the world. Many of the villagers in the Ganges Basin are highly dependent on the resources of the riverine system to meet their basic needs, including water security and nutritional requirements through fishing and agriculture. The river system also has strong cultural and religious significance.

Over the last two decades, the increasing degradation of the River Basin, together with unsustainable fishing, has negatively affected both the dolphin population and human communities living in the basin. Large-scale commercial fishing is undertaken in dolphin habitats, and due to destructive fishing methods (e.g. the use of small mesh nylon mosquito nets), fish catches are unsustainable and fish populations have been depleted. The water quality is deteriorating due to the use of chemical agricultural fertilizers and pesticides in the catchment areas, industrial pollution (including sand mining and high levels of chromium from the leather industry), pollution from untreated raw sewage waste, and other human activities such as mass bathing by large numbers of pilgrims during festivals and post cremation rituals. Furthermore, due to the dramatic reduction in water flow during the dry season, there is salt water intrusion at the river mouth. This degradation of water quality is endangering people and destroying dolphin habitats.

The population of the Ganges River dolphin has been further depleted due to several additional human-induced factors such as incidental catch in fishing nets, and the targeted capture of dolphins for oil (which is used medicinally and to attract catfish in net fishing). The construction of dams and barrages on the rivers, which divert water for irrigation and other uses, created permanent barriers across the river, blocking the movement of the dolphins.

WWF is working to identify and implement workable solutions to prevent the degradation of the river system which will benefit both the dolphin population and the local people who depend directly on the river in numerous ways for survival. These include: improving water quality through the minimization of chemical fertilizer and pesticide use; afforestation; the introduction of innovative methods to reduce fuelwood use; and other measures to reduce soil erosion. In addition, encouraging alternative livelihood options that put less pressure on the natural environment while providing higher economic returns has been effective.

Over the last two decades, the increasing degradation of the Ganges River Basin, together with unsustainable fishing, has negatively affected both the human and dolphin populations.

3. Initiatives and Results

The Ganges River Dolphin Conservation Initiative in Farida village was launched in 2001 by WWF India as a pilot programme to improve livelihoods, improve the conservation status of the river dolphins in the area, and influence government policies on conservation. Farida village, located in the Bulandshahar district of Uttar Pradesh, was chosen following a socio-economic survey of 26 villages in the vicinity of the upper Ganges River stretch, which identified Farida as the least developed village. The community of Farida is highly dependent on the river for livelihoods, and the stretch of the river Ganges at Farida is important habitat for the Ganges dolphin. It is hoped that the achievements the programme has made in Farida will be replicated in villages along the entire area of river dolphin habitat.

Several activities were initiated in the village. Special attention was given to the education and awareness raising programme, and capacity building within the community to achieve sustainable livelihoods. These activities included:

- Information dissemination and rapport building with the community
- Meetings, discussions and dialogue with the community, *Panchayati Raj Institutions*[6] (PRIs), departments, and block and district administration offices related to the programme
- Identification of volunteers, and formation of a village level environmental committee through the involvement of the *Gram Panchayat*[7] and the community
- Orientation and training of PRI-elected representatives and the village environmental committee
- Resource mapping and socio-economic surveys for collecting primary and secondary information
- Conducting surveys to facilitate the development of alternative sources of livelihood for the villagers and to assess the availability of local resources
- Ward or community level meetings for identification and prioritization of local environmental issues through community participation
- Village level meetings for prioritization of local environmental issues
- Preparation of a village development plan with an emphasis on local environment issues
- Resource mobilization for implementation of the plan through community and PRI participation.

In April 2005, a household survey was conducted in the village to quantify the change in livelihood assets of local communities, examine the effect of the conservation programme in developing livelihood strategies, and to fully understand the contribution that the programme had made towards enabling good governance in the study area. A randomly selected sample of the village was surveyed through a series of interviews and observations,

[6] *Panchayati Raj Institutions* are the grass-roots units of self-government in India, operating at village, block, and district level.

[7] *The Gram Panchayat* is the village council; the lowest tier of the *Panchayat* system.

using Participatory Rural Appraisal (PRA) methodologies. The sample consisted of 62 households (approximately 10 per cent of the village) with an average household of seven, equalling a total of 438 people (247 males and 191 females). Several meetings and discussions were held with the villagers to generate a better understanding of their livelihood strategies. The changes in selected variables between the year 2001 (i.e. before the programme) and the year 2005 (present) were recorded and the results are summarized in the following sections.

3.1. Ensuring Good Governance

India is the largest democratic republic in the world and the division of power between the executive, the legislature, and the judiciary is fundamental to enabling the nation to ensure good governance. The 73rd Amendment of the Constitution of India has given statutory recognition to the *Panchayati Raj Institutions* (PRI), the grass-roots units of self-government. The Amendment created a three-tier *Panchayati Raj* system of democracy: *Gram Panchayats* at village level; *Panchayat Samitis* at block level; and *Zilla Parishads* at district level. One-third of all seats in these bodies are reserved for women, and seats are also reserved for members of scheduled tribes and scheduled castes proportional to their population. To ensure that the Panchayats themselves stay accountable to all the people of their constituency, they are required to hold village assemblies (*gram sabha*) several times each year, with a quorum of citizens attending. The PRIs are responsible for the preparation and implementation of a plan for economic development and social justice, that includes the functioning and funding of 29 areas of development (or subjects). Many of these subjects are closely related to the conservation of natural resources and biodiversity (e.g. agriculture, land, soil, irrigation, water management and river basin development, animal husbandry, fisheries, forestry, minor forest produce, non-conventional energy sources, fuel, and fodder).

Farida village is located in the Farida Banga *Gram Panchayat* (GP). WWF India facilitated the preparation of the plan for economic development and social justice by involving the *gram sabha* members, as well as the elected representatives of the GP. The plan was able to identify and prioritize local problems and issues of importance, and a plan of action for effective implementation was also prepared. The whole process was instrumental in building capacity within the local governmental institutions.

People in Farida village had been unaware of the potential benefits of the PRIs until the introduction of a comprehensive education and awareness programme by WWF. The household survey, and discussions with villagers, revealed that the programme generated considerable confidence among the people in the village to demand good governance, thereby ensuring improved livelihoods (see section 3.2 below).

The household survey, and discussions with villagers, revealed that the programme generated considerable confidence among the people in the village to demand good governance, thereby ensuring improved livelihoods.

3.2. Improving Livelihood Assets and Building Livelihood Strategies

Improving the livelihood assets and strategies of the local people in Farida village is benefiting both the villagers and the natural environment in which they live, by reducing the villagers' reliance on natural resources to provide for the majority of their basic needs.

Increasing capacity within the community to capitalise on existing alternative livelihoods options

Prior to the programme, discussions with the community indicated that many people were living in poverty. It was also discovered that the demand for labourers in the adjacent towns had risen due to increased construction activities in the area. The nature of employment varied, but included skilled and unskilled labour, carpentry, tailoring, and domestic help. WWF purchased employment newsletters in the local language and made them available in the village library that had been set up by the organization. In addition, WWF contacted eligible villagers directly and motivated them to obtain employment. The programme was thus instrumental in enabling villagers to take advantage of these and other employment opportunities.

The programme connected with, or mobilized, various government agencies to facilitate the training of villagers to set up cottage and small-scale enterprises and assist them in securing financial support from banks and cooperative societies. It also made use of its liaison with companies and corporate organizations to generate employment opportunities for the villagers. Finally, the WWF team arranged for a number of visitor groups to come to Farida, which generated some employment and income-generating opportunities.

Increasing capacity within the community to capitalise on government initiatives

The government offers several schemes for the conservation of the Ganges River Basin. Many of these schemes such as *Indira Awas Yojana* (construction of houses for the poor with full government support), *Pradhan Mantri Sadak Yojana* (the development of roads and drainage connections in rural areas), and *Pradhan Mantri Rojgar Yojana* (the provision of employment for rural youth), have provisions to address livelihood issues and poverty.

The number of landless households declined from 24 per cent to 18 per cent during the survey period.

The *Gram Panchayat* organizes *gram sabha* meetings every month in the village to identify the needs of villagers and to discuss implementation plans of various schemes. However, due to deficiencies in information dissemination and organization, these meetings were not yielding significant results. WWF, therefore, intervened with meetings and a comprehensive awareness programme informing the villagers about the benefits they could accrue from the government schemes.

The provision of information, facilitation, and empowerment of local villagers by the WWF Programme has enabled them to access numerous government development schemes. WWF facilitated the preparation of micro-plans for village development by bringing together all concerned agencies and, more importantly, supporting active participation of the villagers. The follow up with the local government agencies to approve the micro-plans was also a crucial step in the process. Copies of the micro-plans were subsequently made available to the villagers through the *gram sabha*.

About 66 per cent of households placed their grievances or suggestions for improving their livelihoods to the GP or the relevant government agencies. Of these, 8 per cent were settled, 15 per cent are still under process, and 29 per cent were not considered. Information is unavailable on the remaining 47 per cent.

The following improvements have been made in the village of Farida as a result of the community successfully accessing Government schemes: the construction of a 5km stretch of road to connect the village with the nearby town (under the *Pradhan Mantri Sadak Yojana* — the Prime Minister Road scheme); the construction of 35 concrete houses for the most impoverished members of the community (under the *Indra Gandhi Awas Yojana* — the Indra Gandhi Residential Scheme); the construction of 20 concrete houses for members of the fishing community (under the *Matshy Awas Yojana* — the Residential Scheme for Fishing Communities); the construction of 75 toilets and mud/brick roads within the village and the development of a draining system (under the *Gram Vikas Yojana* — Village Development Scheme); and the construction of a middle school (under the *Sampurn Siksha Yojana* - Education For All Scheme). Local villagers were employed as labourers in all the construction work involved in the aforementioned developments.

A major problem for villagers who did not own land was that the majority of government schemes are conditional on land ownership. To tackle this hurdle, WWF brought the local administration and landless villagers together and facilitated a decision by the *Panchayat* to provide land and ownership to landless villagers on lease, thus making them eligible for the government schemes. The number of landless households declined from 24 per cent to 18 per cent during the survey period.

All households are now aware of one or more of the schemes of the PRIs that address livelihood improvements. The survey reported that about 78 per cent of households came to know about such schemes through the WWF Conservation Education and Awareness Programmes.

Income and poverty

The average annual household income in Farida village has increased from US$736 to US$873 during the survey period. The per capita monthly income has increased from US$8 to US$10. The Planning Commission of the Government of India estimated US$7 as the poverty line for rural areas in Uttar Pradesh. Using this baseline, the level of poverty in Farida has declined from 55 per cent to 45 per cent during the survey period. The decline in poverty is due to increased employment and an increase in cash income. The survey reported that the WWF Programme played a key role in informing and mobilizing the local people to capitalize on various employment opportunities in adjacent areas. Additionally, new jobs and opportunities were created because of the increased use of government development schemes – something that was also due, in a large part, to the WWF Programme.

Land

The people in Farida village are poor and the majority of the community is dependent on the subsistence farming of wheat, rice, sugarcane, vegetables, and pulses. During the survey period, the area of land owned by each household increased from an average of 3.00 to 3.19 acres. Discussions with villagers indicate that the education and awareness programme informed them of available opportunities and motivated them to negotiate leasing land from the government. Increased income, as a result of the programme, also led to an increase in land ownership, as more of the villagers were able to buy land.

Livestock

Livestock, which includes buffaloes, cows, and goats, is an important livelihood asset in Farida. The number of livestock in the sample households increased considerably during the survey period due to the increase in income facilitated by the WWF Programme. For each household, the number of buffaloes increased by an average of 51 per cent, cattle by 55 per cent, and goats by 26 per cent during the survey period. These animals are important for milk and milk products, transport, and fuel (known as *upli*, made from cattle dung, which is mainly used as a fuel for cooking).

Asset profile

The asset profile of households indicates that the number of televisions has increased nine-fold and the number of

scooters five-fold during the survey period (partly because of a new road that was built to the village). The households that were surveyed reported that the role of WWF in facilitating employment for the villagers was instrumental in helping to enhance their livelihood assets.

Household expenditure

The people in Farida village use 53 per cent of their household expenditure on food, 15 per cent on clothing, and 10 per cent on education. There has been no major shift in the pattern of household expenditure during the survey period.

Loans and savings

The study shows that loans taken by the people in Farida village have increased during the survey period. The number of households in debt has increased from 48 per cent to 64 per cent and the average annual loan per household has increased from US$190 to US$257 over the survey period.

The villagers take loans mainly for agricultural purposes, but also for personal reasons and to purchase equipment and tools for work. Sixty per cent of the loans come from private money-lenders who charge an interest rate of 5 per cent per month or more, which is high compared to cooperative societies or banks, which charge less than 1 per cent if the loan is for agricultural purposes. Despite this, there is a 10 per cent increase in the share of private money-lenders during the survey period. At the same time, the share of cooperative societies and banks has marginally declined from 22 per cent to 20 per cent. This issue can be addressed through the strengthening of micro-credit and self help groups in the village, or by improving access to national banks.

About 52 per cent of households have savings, and 78 per cent of these households deposited their savings in cooperative societies or banks. Only 3 per cent of households deposited their savings with private money-lenders.

3.3 Improving Water Quality

Good water quality in the Ganges river system is critical in order to maintain healthy aquatic ecosystems, and to support the human populations that rely on the water for drinking and irrigation, as well as cultural and other purposes.

Reforestation

Riparian forests are of critical importance to the health of the Ganges river system. Forests help to filter water, increase fish abundance through the provision of substrate formed from leaf litter (Nilsson and Svedmark, 2002), and increase favourable habitat for river dolphins. As the river meanders around fallen trees and other obstructions derived from the forest, areas of high productivity are formed that are important feeding grounds for dolphins.

The provision of information, facilitation, and empowerment of local villagers by the WWF Programme has enabled them to access numerous government development schemes.

However, deforestation, and the resultant soil erosion and river siltation, is a major problem in many areas in the upper Ganges River, and is clearly evident in villages like Farida. To address this problem, WWF India operated replanting programmes in selected sites along the banks of the river. The villagers strongly supported and actively participated in the replanting and greening of these areas, and plans are currently underway to expand this work.

Minimizing fuelwood use

The WWF Education and Awareness Programme encouraged villagers to minimize the use of fuelwood as an energy source in order to reduce soil erosion from deforestation. During the survey period, the use of wood as the fuel for cooking declined from 37 per cent to 14 per cent, and the use of *upli* (dried cattle dung) increased from 62 per cent to 85 per cent. The use of *upli* as a fuel, however, has its own associated pollution problems, and WWF is now working to motivate the villagers to install biogas plants, which will ultimately reduce the use of *upli*. Government subsidies are available for the installation of these plants in villages. The percentage of households using fuelwood as their main energy source for cooking declined from 22 per cent to 8 per cent over the survey period.

The villagers depend mainly on kerosene for lighting, and the percentage of households using kerosene increased from 75 per cent to 90 per cent during the survey period. Electricity is used for lighting in 3 per cent of households, Liquefied Petroleum Gas is used in 3 per cent of households, and fuelwood and *upli* are also used. During the survey period the percentage of villagers using fuelwood for lighting declined from 18 per cent to 2 per cent.

Discussions with villagers indicated that people preferred to minimize the use of fuelwood in order to control soil erosion and other environmental degradation.

Pollution control

The results of the study show a clear shift away from the use of chemical fertilizers and pesticides for the cultivation of wheat, rice, sugar cane, and vegetables (on average, the percentage of chemical fertilizers and pesticides used by each household reduced from 81 per cent to 51 per cent, and the percentage of organic fertilizers and pesticides used by each household increased from 19 per cent to 49 per cent during the survey period). Discussions with villagers during the survey revealed that the shift

The villagers strongly supported and actively participated in the replanting and greening of these areas, and plans are currently underway to expand this work.

from chemical to organic practices was due to the WWF Programme.

The villagers are aware of the urgent need for the polluting industries on the river stretch to comply with environmental standards. Such industries release effluents visible by the sudden change in the colour of river water. As a result of the WWF Programme, the villagers are more confident that their collective voice can support and strengthen the initiatives to address the issue of industrial water pollution.

Water sourcing and method of collection

The WWF Programme educated the villagers on how they could contribute to ensuring safe drinking water. As a result, the villagers have participated in designing drainage systems and introducing improved methods to ensure drinking water quality. The results of this case study show a sharp decline in the number of households sourcing water directly from the river for drinking and irrigation purposes (from 30 per cent to 8 per cent of households). This is due to the increase in the numbers of tube wells in the village (the percentage of households with access to tube wells increased from 47 per cent to 92 per cent during the survey period).

The use of motor pumps for collection of water for irrigation has increased from 68 per cent to 94 per cent of households. For drinking and other domestic uses, 63 per cent of households use manual methods such as hand pumps and 32 per cent of households use motor pumps. The increase in motor pumps in the village is due to the increased availability of electricity since 2001. To help mitigate the negative effects of water abstraction, including the increased use of motor pumps, WWF aims to develop rain harvesting and other suitable methods that will help to maintain the ground water level of the village.

3.4. Health and Gender

The WWF Programme helped to generate more attention towards healthcare in the village. Over the survey period there was a decline in the high levels of disease in the village, including waterborne diseases, respiratory diseases, malaria, and others.

Before WWF's intervention, girls were not permitted to attend school, particularly after completing middle school. As a result of continuous effort from the WWF Programme, this situation has changed and presently all girls in the village attend school. The GP has reserved places for women representatives from the village. Previously however, the husbands of the elected women would perform most of the official functions and the elected female representative would only be present for the signing of documents. This was the standard practice in several villages that had elected women representatives. WWF organized campaigns to make the villagers aware of this issue and to build confidence in the husbands of the female representatives. As a result, the women representatives now directly handle all official functions. The contribution of the programme towards the empowerment of women in the village has helped secure the confidence and cooperation of the villagers.

The percentage of chemical fertilizers and pesticides used by each household reduced from 81 per cent to 51 per cent.

3.5. Forging Partnerships

Through this programme, WWF India has developed an effective network of programme partners, including: the State Forest Department; the State Administration; the Wildlife Institute of India; Jiwaji University; NGOs such as the Nature Exploration Group; Narora (NEG); the Dolphin Conservation Society; and Guwahati and Vikramshila Biodiversity Research Center, Bhagalpur (VBRC). The other major programme partners involved in the programme are: the Ministry of Environment and Forests; Government of India; and the Bombay Natural History Society (BNHS). This diverse and broad range of partnerships provides a foundation that is absolutely crucial for the sustainability of the work in Farida, and increases the possibility of replicating the work in other areas.

Furthermore, for villagers to be eligible for government schemes that will improve their livelihoods, the village must have effective partnerships with local institutions and the awareness, cooperation and acceptability of villagers at the grass roots level. These are key partnerships that the WWF Programme will continue to focus on in Farida village.

3.6. Conserving Natural Capital

The WWF Programme has resulted in improvements in the environmental sustainability of the area and improved the conservation status of the region's biodiversity. This has occurred most significantly through improvements in water quality (see section 3.3 above), and a reduction in the unsustainable use of natural resources such as fish and timber. Prior to the commencement of the programme, the people of Farida village engaged in significant commercial fishing activities — through a lease from the Revenue Department of the State of Uttar Pradesh that allows fishing on some stretches of the river. This lease was granted despite the fact that the Forest Department of the State of Uttar Pradesh had issued a ban on commercial fishing due to the area's importance for dolphins. As a result of the WWF Programme, the majority of villagers stopped commercial fishing activities and have started to participate in alternative livelihoods that provide them with better economic benefits than fishing. The awareness-raising work has successfully instilled a belief and a

The level of poverty in Farida has declined from 55 per cent to 45 per cent during the survey period. The decline in poverty is due to increased employment and an increase in cash income.

willingness in the villagers to contribute to conservation by ensuring sufficient food for the dolphins in this particular stretch of the river. WWF is now working with the district administration to enforce the ban on commercial fishing in this area.

These improvements have had a positive impact on the dolphin population in the area. Dolphin sightings in the section of the Ganges near Farida are far more common than before. In 2005, a ten-day WWF survey recorded five dolphins in the Farida village *ghat* (a stairway leading to the river). In the entire 165km stretch of the upper reaches of the Ganges, between Bijnor and Narora in the state of Uttar Pradesh, the number of dolphins has doubled to 40 over a ten-year period.

4. Lessons Learnt

Working with communities to develop programmes that improve livelihoods, while improving the management of the natural environment, is complex. Many factors are involved, and a wide range of stakeholders need to be engaged, including government, business, NGOs, and individuals. New skills and innovative approaches must be tried and tested, and partners with a broad range of expertise must be engaged to make the programme a success. For example, this study shows that an awareness and facilitation programme led to people seeking new jobs and accessing government schemes that they were previously ignorant of. It is important to note that whilst making communities aware of the links between livelihood benefits and wildlife conservation is no easy task, it would not have been possible for WWF to motivate the villagers towards dolphin conservation and the sustainable use of natural resources if this approach had not been taken.

Another key lesson learnt is that programmes of this kind require a significant and long-term investment. Long-term support is needed to ensure that issues such as debt can be managed effectively, and to ensure that livelihood improvements do not lead to negative impacts on biodiversity in the long-term (for example, ensuring that increasing livestock numbers do not have damaging environmental impacts in the future).

In the entire 165km stretch of the upper reaches of the Ganges, between Bijnor to Narora in the state of Uttar Pradesh, the number of dolphins has doubled to 40 over a ten-year period.

An interesting lesson learnt from the programme was the effective use of the media to assist in the delivery of the programme's goals. The participatory nature of the conservation programme and the overwhelming support and active involvement of the people in Farida village generated substantial attention from the media at local, national, and international levels. This provided a useful tool to showcase and generate support for the work that was being undertaken.

For the future, the most important lesson learnt from the programme is that effective partnerships with local governments and communities can be established to benefit local communities, as well as the natural environment in which they live. Negotiation skills play a crucial part, and WWF is helping to build the necessary skills in local people to help them find partnerships and investments, not only with the government but also with other parties. This programme provides a good model that can be used on a large scale through government agencies, with the support of local NGOs. One of the significant achievements of the work in Farida was the confidence it inspired in local government, thus encouraging the replication of this kind of work in other villages throughout the Ganges River Basin.

Meeting between WWF India's Ganges River Dolphin Project leaders and local leaders in the village of Farida, Uttar Pradesh, India. © WWF-Canon / Brian Thomson

Appendices

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Appendix 1
The Millennium Development Goals (MDGs)

Eight MDGs were derived as a roadmap for achieving the Millennium Declaration, which was adopted by the member states of the United Nations in September, 2000. The MDGs have become a guiding framework for development assistance. It commits the international community to poverty reduction and pro-poor growth.

1. Eradicate extreme poverty and hunger.
Target for 2015: Halve the proportion of people living on less than a dollar a day.

2. Achieve universal primary education.
Target for 2015: Ensure that all boys and girls complete primary school.

3. Promote gender equality and empower women.
Target for 2005 and 2015: Eliminate gender disparities in primary and secondary education, preferably by 2005 and at all levels by 2015.

4. Reduce child mortality.
Target for 2015: Reduce by two-thirds the mortality rate among children under five.

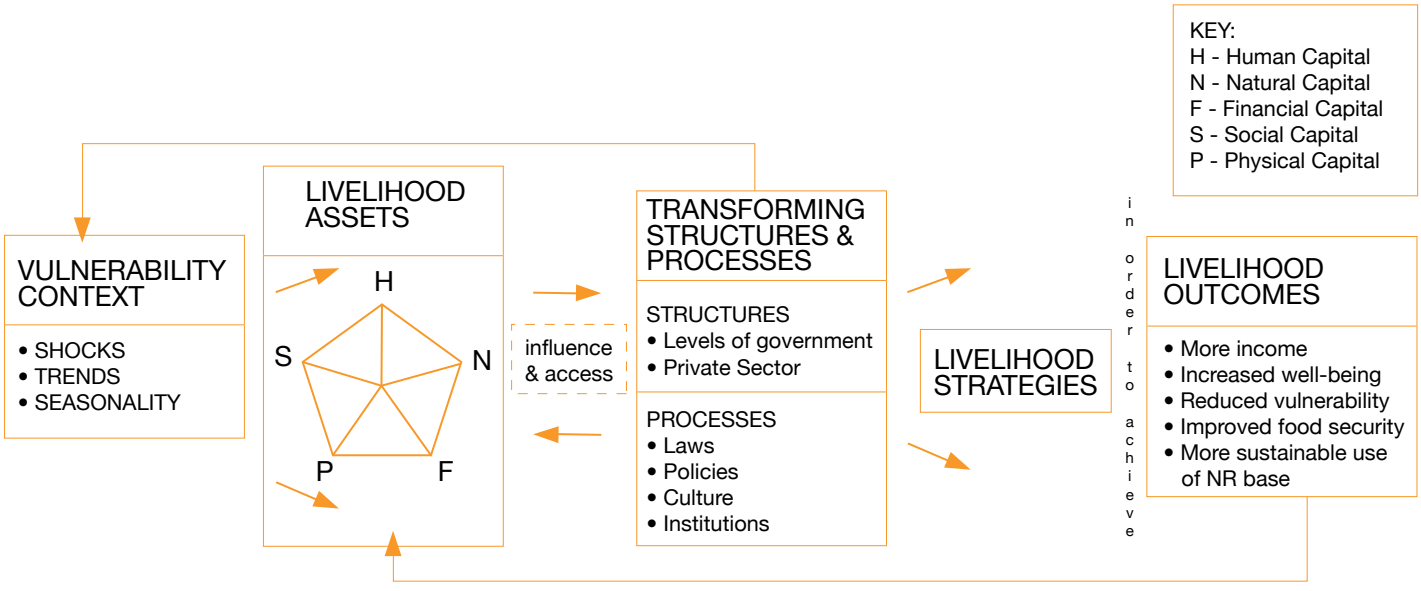
5. Improve maternal health.
Target for 2015: Reduce by three-quarters, the maternal mortality ratio.

6. Combat HIV/AIDS, malaria and other diseases.
Target for 2015: Halt and begin to reverse the spread of HIV/AIDS and the incidence of malaria and other major diseases.

7. Ensure environmental sustainability.
Targets:
- Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.
- By 2015, halve the proportion of people without sustainable access to safe drinking water and basic sanitation.
- By 2020, achieve significant improvement in the lives of at least 100 million slum dwellers.

8. Develop a global partnership for development.
Targets:
- Address the least developed countries special needs, and the special needs of landlocked and small island developing states.
- Develop further an open, rule-based, predictable, non-discriminatory trading and financial system.
- Deal comprehensively with developing countries' debts.
- In cooperation with developing countries, develop and implement strategies for decent and productive work for youth.
- In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries.
- In cooperation with the private sector, make available the benefits of new technologies – especially information and communications technologies.

Appendix 2
The Sustainable Livelihoods (SL) Framework



Appendix 3
Analytical Framework for Assessing Sustainable Livelihood (SL) Outcomes in Species Conservation

1. Project Goals and Objectives

- Do they include sustainable development/sustainable livelihoods and its components? How is this articulated?

2. Linkages of Conservation to Sustainable Development

- Has a socio-economic baseline been developed?
- Have participatory consultations of the people been carried out to ascertain their livelihood conditions and priorities? What sort of pra approach was used?
- Have linkages between sustainable development and conservation been identified? How did they articulate these links?
- What steps is the project or CPO taking to incorporate SD and MDGs in their agenda? Are related studies being carried out or planned for? Has SD/Livelihoods staff/expertise been contracted? Are M&E frameworks or log frames being developed and implemented? Has a partnership analysis (including development partners) been carried out and is partnership development occurring in development areas?
- Assessment of the SL component of the M&E or logframe – how comprehensive is it?

3. Analytical Matrix

The Analytical framework used for the assessment of the initiatives and outputs of the projects/programmes.

This Analytical Framework uses the Sustainable Livelihoods Framework (developed by various development agencies) to study a range of indicators to assess the outputs/impacts of the selected projects on the livelihoods of the local people of the project sites.

Note: Since livelihoods is a complex area of study, there are overlaps, and some of the questions may be repeated under different indicators. For simplification, this framework may have placed such questions under one indicator or category instead of repeating them (see next page).

Questions on global partnerships for development (MDGs):

- Is the project working to ensure equitable trade? How?
- Does the project help the country to support international environmental agreements so that the country can negotiate and implement agreements to benefit its rural poor?

Other important questions relevant to the study are:

- Assess differences between stakeholders: who are the stakeholders and who are benefiting?
- What makes people vulnerable (natural factors, policy and institutions) and have interventions helped people to deal with vulnerability?
- Assess the overall significance of different types of impacts: scale of impact with respect to the inputs invested (money, time, labour); relative contribution of the impact to livelihood sustainability and security (in comparison to other options, if any); and the value people attribute to the impact.
- While assessing financial aspects, assess whether a new activity leads to diversification, and its risk factors and advantages to the individual or group to maintain liquidity.

Analytical Matrix

Indicators	*Status before project intervention*	*Initiatives made by the project*	*Output of project interventions*	*Policy impacts (local, regional, and national level impacts)*	*Sustainability aspect of the initiative/ output*
I. Governance of Natural Resource a. Access or ownership of resource by the local community. Clarify issues involved b. Institutional strengthening — i.e. strengthening of community organizations to work together for common objectives such as common property resources: (i) transparency (ii) accountability (iii) participation (iv) institutional efficiency (regular meetings and minuting, income management, representation of gender and the disadvantaged) c. Strengthening a community in its relations with outsiders and the wider society (incl. political authorities and central govt) d. Empowerment of individuals and the community, particularly marginalized people such as the poor, and women e. Equitable sharing f. Information access					
II. Building Livelihood Assets: Human; Financial; Physical; Political; Social, Human, social and political capital: a. Skills acquired b. Cash earnings invested in education, health c. Social networks developed and strengthened d. Empowerment e. Governance capacity building for NRM Financial capital: a. Increase in income b. Employment generated c. Skills acquired d. Does the project affect access to assets, or change their quality or productivity? e. Does time spent on the activity conflict with or complement the seasonal timetable of other existing activities? Different types of income need to be distinguished and estimated: i. Who is earning: number of people, per cent of relevant population, type of person? How much: typical amount per person? ii. Wages earned by employees iii. Earnings from sales of products iv. Collective community income v. Profits earned by enterprise owners					
Physical capital: i. Infrastructure supported ii. Equipment supported					
III. Building Livelihoods Strategies: a. Access, ownership rights, and benefits (cash and use) from communal resources b. Access, ownership rights, and benefits (cash and use) from Protected Areas c. Diversification of farm and off-farm livelihood strategies: type of activity; cost benefits; sustainability					
IV. Vulnerability: Has the project contributed to reducing the vulnerability of the poor to stresses and shocks? If so, in what ways?					
V. Environmental Sustainability: a. Has the project led to sustainable utilization of natural capital — e.g. wildlife, forests, fish stocks, etc. (better management regimes, appropriate methods and equipment, monitoring) b. Improvement in species numbers, habitat area (quality and quantity).					

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- promoting the reduction of pollution and wasteful consumption.

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