





# Asia Protected Planet Report 2014

Tracking progress towards targets  
for protected areas in Asia

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# Executive Summary

## BACKGROUND

Asia is the most populous region in the world, with a rich cultural and natural heritage. It includes several megadiverse countries and is home to a number of global biodiversity “hotspots”. For centuries, protected areas have been an integral part of Asian landscapes and seascapes and have played a vital role in conserving biodiversity and the ecosystem services on which many communities depend. However, rapid economic development, population growth and an erosion of traditional practices are resulting in habitat loss and degradation. This is putting protected areas in Asia at risk and leading to serious decline in the biodiversity they harbour.

In 2010, governments from around the world, including all countries in Asia, committed to the Convention on Biological Diversity’s Strategic Plan for Biodiversity which sets 20 targets to be met by 2020 to conserve biodiversity and ensure its sustainable and equitable use. These are known as the Aichi Biodiversity Targets. Aichi Target 11 focuses on protected areas, calling for the expansion of protected areas to encompass 17% of terrestrial ecosystems and 10% of marine ecosystems to cover areas of importance for biodiversity and ecosystem services. It also calls for the effective and equitable management of ecologically representative and well-connected networks of protected areas, which are integrated into the wider landscape. These targets and the principles they represent are critical to ensuring that protected areas will continue to deliver on the objectives for which they were established.

## SCOPE

This report assesses progress towards the achievement of elements of Aichi Biodiversity Target 11 in 24 selected countries in East Asia, South Asia and South-east Asia. These are referred to as the “Asia Region” throughout this report and are: Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Democratic People’s Republic of Korea, India, Indonesia, Japan, Lao People’s Democratic Republic, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, the Republic of Korea, Singapore, Sri Lanka, Thailand, Timor-Leste, and Viet Nam.

## KEY RESULTS

Although the extent of protected areas increased between 1990 and 2012, this trend has slowed since. The Asia Region currently faces numerous challenges in meeting all elements of Aichi Biodiversity Target 11 (Chapter 9). Some key results and messages are:

**Threats to protected areas (Chapter 2):** The rich natural heritage found within the Asia Region’s protected areas is under threat. Major threats to protected areas are habitat loss and degradation, exploitation of biodiversity due to high population densities (1.5 times the global average) and increasing demands from a globalised market. As a result, pollution, invasive species, illegal wildlife trade and deforestation are serious threats that urgently need to be addressed. Innovative ways to support conservation, better-enforced legislation, and new political commitments to effectively manage and restore protected areas are needed.

**Protected area coverage (Chapter 3):** There are 10,900 protected areas in the Asia Region that cover 13.9% of the terrestrial environment and 1.8% of the marine and coastal areas within national jurisdiction. The protected area coverage beyond 12 nautical miles is critically low: only 0.04% of the marine and coastal areas between 12 and 200 nautical miles of the Region is under protected area management. Very few countries have at least 17% of their terrestrial areas and inland waters protected and no countries have at least 10% of their marine and coastal areas in protected areas.

**Protection of biodiversity and ecosystem services (Chapter 4):** Protected areas in Asia do not adequately cover areas of importance for biodiversity and are not fully ecologically representative. In 2013, 16% (326) of Important Bird and Biodiversity Areas (IBAs) and Alliance for Zero Extinction sites (AZEs) were completely covered by protected areas. Ecoregion coverage is very low in both terrestrial and marine environments. Only 35% of ecoregions and 15.4% of marine ecoregions in the Asia Region are adequately protected.

**Protected area management (Chapter 5):** 77% of marine and terrestrial protected areas in the Asia Region are mainly classified as IUCN Management Category IV (Habitat/Species Management), V (Protected Landscape/Seascape) and VI (Protected areas with sustainable use of natural resources). More progress is needed to assess management effectiveness in the Asia Region. In 2013, only eight of the 24 countries included in this report (Bhutan, Brunei Darussalam, Cambodia, Lao PDR, Mongolia, Nepal, Singapore, and Republic of Korea) had assessed management effectiveness of 60% of the total areas of their protected areas, while 13 had only assessed 30%. Adequate funding is critical to achieve these goals and ensure protected areas in the Asia Region can conserve their values (Chapter 5).

**Protected area governance (Chapter 6):** Protected area systems in Asia have primarily been established by national governments. All four main governance types are represented in the World Database on Protected Areas. However, 60% of protected areas in the region are under sub-national and national governance. The Asia Region has a long history of traditional conservation practices. Sacred groves and landscapes are found through the region and some are significant repositories of biodiversity. The Asia Region has unique governance systems including the Satoyama Satoumi in Japan, Aranyas forests in Nepal and the Orans in India. Widening governance types to more shared types and recognizing the role of local communities in protected areas governance is needed.

**Connectivity (Chapter 7):** The Asia Region hosts a number of large-scale conservation projects which promote connectivity of protected areas. These include: the Coral Triangle Initiative (CTI), Heart of Borneo Initiative (HoB), Greater Mekong Sub-region Core Environment Program (GMS CFP-BCI), the East Asian-Australasian Flyway Partnership (EAAFP) and the Terai Arc programme. However, there have been relatively few studies on how effective protected area networks are at delivering conservation outcomes in Asia compared to other regions of the world.

**Protected areas and disaster risk reduction in Asia (Chapter 8):** Protected areas can play an important role in disaster risk reduction (DDR) and climate change adaptation (CCA). Experience from disasters such as the Western Indian Ocean tsunami in 2004 demonstrates that well managed protected areas can help reduce risks posed by natural hazards and longer term climate change impacts. Defining and highlighting the role of ecosystem services within protected areas and explaining how they contribute to CCA and DRR should be a priority for regional and national policy dialogues and platforms.

### *Quick guide to this report*

Chapter	Relevant element of Aichi Biodiversity Target 11
2 – Threats to Protected Areas in Asia	“...integrated into the wider landscape and seascape.”
3 – Protected Area Coverage	“...17 % of terrestrial and inland water areas and 10 % of coastal and marine areas...”
4 – Protection of Biodiversity and Ecosystem Services	“...especially areas of particular importance for biodiversity and ecosystem services...” “...ecologically representative...”
5 – Protected Area Management	“...effectively managed...”
6 – Protected Area Governance	“...equitably managed...”
7 – Connectivity	“...well connected systems of protected areas...”, “...integrated into the wider landscape and seascape.”, and “...effectively managed...”
8 – Protected Areas and Disaster Risk Reduction	“...integrated into the wider landscape and seascape.”
9 – Conclusions and Key Messages	All elements

# 1. Introduction

Asia may have been the place where the first protected areas were created (see Chapter 5) and it hosts a vast diversity of species and ecosystems (see Chapter 4). In addition, Asia's cultural diversity and heritage has had a tremendous bearing on conservation in the region with some governance systems being unique in the world (see Chapter 6). However, the fast population growth and booming economic development in many countries in the region have resulted in increasing pressures on the landscape and its natural resources, which have a profound impact on protected areas (see chapter 2).

Asia is the most populous region in the world and in this context protected areas become even more important for safeguarding biodiversity, natural capital, ensuring the delivery of ecosystem services, and minimizing the effects of climate change on people and nature now and in the future (see Chapter 8).



## 1.1. THE FIRST ASIA PARKS CONGRESS

The first Asia Parks Congress (APC) took place in Sendai, Miyagi Prefecture, Japan, 13-17 November 2013. It was organized by the IUCN (International Union for Conservation of Nature) and the Ministry of the Environment, Japan (MOE-J). There were over 800 participants which included central and local governments, international organizations, NGOs, academic institutions and students from 40 countries and protected area authority officials from 22 Asia countries.

The theme of the first APC was 'Parks Connect' signifying the connections of protected areas linkages across biophysical land and seascapes, social and cultural diversity, generations and different stakeholders. The Congress aimed to enable the establishment of a regional partnership for achievement of the Aichi Biodiversity Targets and more effective implementation of the Programme of Work on Protected Areas of the Convention on Biological Diversity. Finally, the APC hoped to send out a consolidated message from Asia towards the World Parks Congress to be held in November 2014.

### Outcomes of the Asia Parks Congress

A significant product of the APC was the first 'Asia Protected Areas Charter'. The consolidated outcome of the six working groups resulted in the 'Message from the 1st Asia Parks Congress to the IUCN World Parks Congress, Sydney 2014'. The separate youth session resulted in 'The first Asia Parks Congress Youth Declaration'.

**The 'Asia Protected Areas Charter' acknowledges the rich heritage of Asia's natural and cultural diversity and recognizes the challenges of the region as rapid development has taken a toll on this very diversity.**

Finally, recognizing the need for a cooperative framework in the context of protected areas in Asia, a partnership planning committee was formed. The committee has representation from IUCN Asia Regional Office, the WCPA and MOE-J, as well as interested governments and international organizations. For more about the first APC see [www.asia-parks.org](http://www.asia-parks.org)

#### Highlights of 'Asia Protected Areas Charter'

- Protected areas for disaster risk reduction and recovery
- Harmonization of regional development and the conservation of biodiversity
- Collaborative management of protected areas
- Linkages between protected area management and cultures and traditions
- Sustainable tourism and education for environment and sustainable development
- Strengthening protected area collaboration.

## 1.2. PROTECTED AREAS AND THE CONVENTION ON BIOLOGICAL DIVERSITY

In 2010, parties to the Convention on Biological Diversity (CBD) agreed the Biodiversity Strategic Plan<sup>2</sup> which aims to conserve biodiversity and ensure its sustainable and equitable use. The CBD Biodiversity Strategic Plan is underpinned by 20 targets that need to be met by 2020. Recognizing the importance of protected areas, Aichi Biodiversity Target 11 reads:



*By 2020, at least 17 % of terrestrial and inland water areas and 10 % of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.*

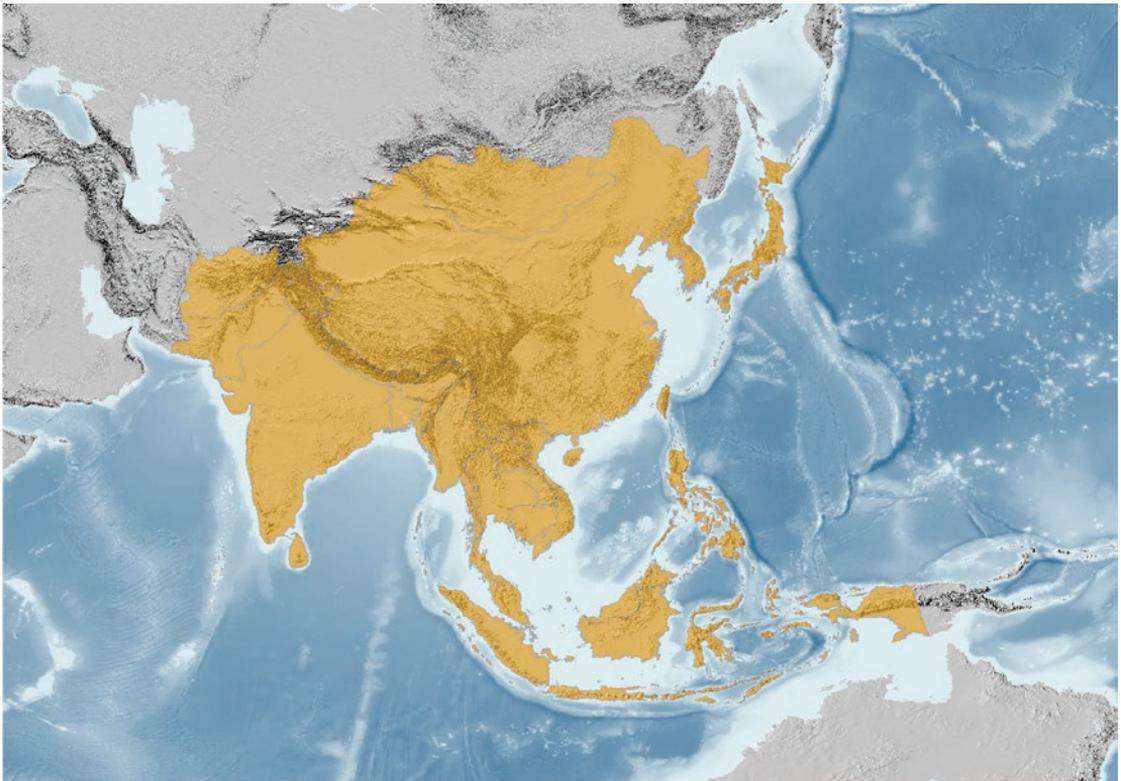
The CBD's focus on protected areas dates from much earlier than 2010. In 2004, the CBD Parties adopted the Programme of Work on Protected Areas (PoWPA)<sup>3</sup>. This is probably the most comprehensive protected area commitment ever made by the international community. PoWPA includes 16 goals and a series of time-bound targets that are still ongoing. By 2014, 12 Asian countries of the 24 included in this study had developed PoWPA action plans.

### 1.3. SCOPE: THE FIRST REGIONAL PROTECTED PLANET REPORT

Since the success of the 2012 edition of the Protected Planet report which analysed progress towards global targets for protected areas focusing on key elements of CBD Aichi Target 11<sup>4</sup>, there has been a growing interest in conducting similar analyses at a regional scale. In 2013, building from the outcomes of the Asia Parks Congress, the IUCN Asia Regional Office and UNEP-WCMC started a project that aimed to fill this knowledge gap for Asia.

**The scope of this report is 24 Asian countries in East Asia, South Asia and South-east Asia referred to as the “Asia Region”**(Figure 1.1). These countries are: Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Democratic People’s Republic of Korea, India, Indonesia, Japan, Lao People’s Democratic Republic, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, the Republic of Korea, Singapore, Sri Lanka, Thailand, Timor-Leste, and Viet Nam.

**The aim of this report is to assess the Asia Region’s progress towards achieving several elements of Aichi Biodiversity Target 11** using the latest update of the World Database on Protected Areas<sup>5</sup>, relevant published literature and expert advice. Aichi Biodiversity Target 11 is a global target for protected areas and it may be used by governments as a reference to set targets at a national level. Because this is a target that all countries included in this report have committed to achieve by 2020, we use Aichi Biodiversity Target 11 as a desired target for the Asia Region.



**Figure 1.1** The “Asia Region” or the 24 Asian countries included in the Asia Protected Planet Report 2014.

## 1.4. THE WORLD DATABASE ON PROTECTED AREAS AND PROTECTED PLANET

Analyses in this report are based on The World Database on Protected Areas (WDPA) August 2014 release (Box 1.1). The WDPA, a joint effort between IUCN and UNEP, is the most comprehensive database on marine and terrestrial protected areas of the world. It is compiled and managed by UNEP-WCMC in collaboration with the IUCN's World Commission of Protected Areas (WCPA). The WDPA is available online through its public interface Protected Planet ([www.protectedplanet.net](http://www.protectedplanet.net)) where it can be downloaded, visualized, and explored.

### Box 1.1 Key facts on the World Database on Protected Areas (WDPA)

- The data in the WDPA is compiled from governments and NGOs, and other authoritative sources.
- The WDPA currently only stores protected areas that meet the IUCN standard definition of protected areas (see box 1.2).
- All protected areas in the WDPA must comply with the WDPA standards which make data interoperable and consistent to be used for analyses and developing indicators<sup>6</sup>.
- It is updated regularly and can be downloaded and visualised at [www.protectedplanet.net](http://www.protectedplanet.net).
- In August 2014, the WDPA had around 209,000 designated protected areas from more than 193 countries and territories.

## 1.5. DEFINITION OF PROTECTED AREAS IN THIS REPORT

Protected areas, globally, are extremely variable in size and very different in governance types and management objectives. There are many definitions of protected areas but for the purpose of this report the IUCN definition of protected areas, which underpins the compilation of the World Database on Protected Areas, is used (Box 1.2). The IUCN definition of protected areas is compatible with the CBD definition of protected areas<sup>7</sup>.

The IUCN and CBD definitions of a protected area may not capture other areas that might have a positive contribution to conservation. The existence of these areas is recognized by the Aichi Biodiversity Target 11 element “...other effective area-based conservation measures”. These are sites for which the primary purpose is not “...to achieve the long-term conservation of nature” but that still have conservation value and may have conservation as a secondary objective. Currently, there is no agreed methodology to identify these areas and there is no global database that compiles records of all such sites. However, some efforts aiming to fill in this gap exist. These include identifying and compiling indigenous peoples and community conserved areas (ICCAs) ([www.iccaregistry.org](http://www.iccaregistry.org)) or Sacred sites ([www.sanasi.org](http://www.sanasi.org)).

## Box 1.2 Defining and classifying the world's protected areas

The WDPA, which underpins most of the analyses in this report, uses the IUCN definition: **A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values**<sup>8</sup>.

**Management Categories:** IUCN has developed a system of protected area management categories that helps classify protected areas based on their primary management objectives (see also Chapter 5). The categories have long been used by the IUCN WCPA and many governments for protected area planning and reporting, including in the WDPA, and the value of the categories for reporting is explicitly recognized in the CBD PoWPA as well as several decisions adopted by the CBD Conference of the Parties (COP)<sup>9</sup>.

**Governance Types:** Protected areas are governed in various and complex ways. Both IUCN and the CBD recognise four broad protected area governance types and 11 sub-types, defined on the basis of who holds authority, responsibility and can be held accountable for the key decisions for protected areas<sup>10</sup>.

**Table 1.1** IUCN's protected areas management categories and governance types.

Source: Borrini-Feyerabend et al., 2013.

Governance types  Protected area categories	A. Governance by government			B. Shared governance			C. Private governance			D. Governance by indigenous peoples and local communities		
	Federal or national ministry or agency in charge	Sub-national ministry or agency in charge	Government-delegated management (e.g., to an NGO)	Transboundary management	Collaborative management (various forms of pluralist influence)	Joint management (pluralist management board)	Declared and run by individual land-owner	...by non-profit organizations (e.g., NGOs, universities, co-operatives)	...by for-profit organizations (e.g., individual or corporate landowners)	Indigenous peoples' conserved areas and territories – established and run by indigenous peoples	Community conserved areas – declared and run by local communities	
Ia. Strict Nature Reserve												
Ib. Wilderness Area												
II. National Park												
III. Natural Monument												
IV. Habitat/Species Management												
V. Protected Landscape/Seascape												
VI. Managed Resource Protected Area												



## 2. Threats to Protected Areas in Asia

Protected areas in the Asia Region are the last remaining strongholds for biodiversity; they preserve natural capital and provide important ecosystem services to vulnerable local communities. However, unsustainable management of these resources threatens protected areas and their surroundings. The 24 countries included in this study support 54 % of the world's population (3.8 billion people)<sup>11</sup>. Population densities across the region are up to 1.5 times the global average, which places high pressure on natural ecosystems<sup>12</sup>. The region contains both developing and highly developed countries and the region as a whole has high economic development.

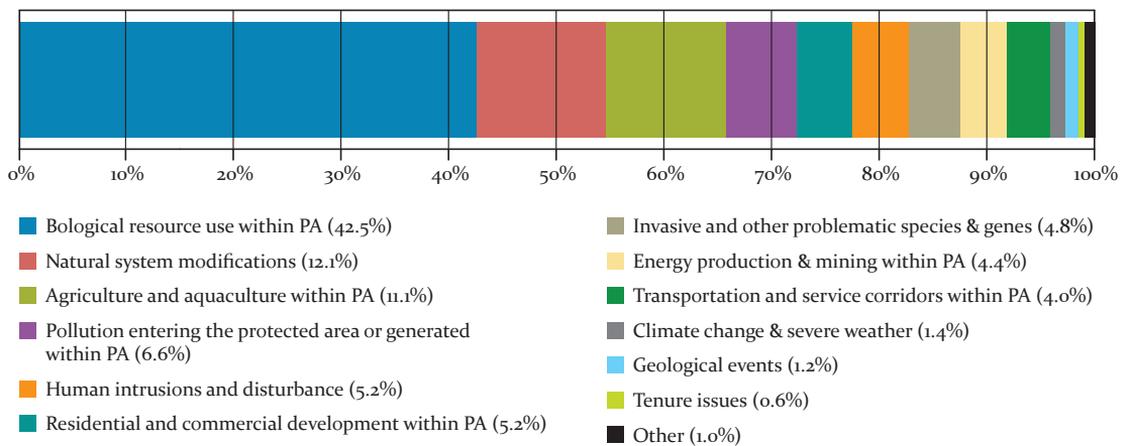
This chapter summarises threats to protected areas in the Asia Region using the threats information from the Protected Area Management Effectiveness database (PAME)<sup>13</sup>. Illegal trade and deforestation are having an important impact on protected areas in South-east Asia<sup>14</sup> and these also receive special attention here.



## 2.1. THREATS TO PROTECTED AREAS IN THE ASIA REGION

The PAME database (PAME) was developed as part of a global evaluation of protected areas' management effectiveness<sup>5</sup> (see Chapter 5 for more information about PAME). PAME assessments report threats to protected areas using an adapted version of the standard classification developed by the Conservation Measures Partnership<sup>6</sup>. This classification of threats is hierarchical and allows recording of general threats (Level 1) as well as more specific threats (Level 2). Data on threats to protected areas were available in 21 PAME assessments carried out for around 500 protected areas in Bhutan, Cambodia, China, India, Indonesia, Lao PDR, Malaysia, Mongolia, Nepal, Pakistan, Thailand and Viet Nam between 2000 and 2009.

Figure 2.1 shows the most common Level 1 threats reported in PAME assessments of protected areas in the Asia Region. The major threat to protected areas reported from these assessments was 'Biological resource use within protected areas' with 42.5% of records, followed by 'Natural system modifications' (12.1%), and 'Agriculture & aquaculture within protected areas' (11.1%). Other commonly reported threats are 'Residential and Commercial Development within protected areas' (5.2%), 'Human intrusion & disturbance' (5.2%) and 'Pollution' (6.6 %).



**Figure 2.1** Percentage (in number of times) of level one threats were recorded in the PAME database in the Asia Region. Information from 21 PAME assessments carried out in around 500 protected areas in Bhutan, Cambodia, China, India, Indonesia, Lao PDR, Malaysia, Mongolia, Nepal, Pakistan, Thailand and Viet Nam between 2000 and 2009. Source: University of Queensland 2010.

'Biological resource use' is the most frequently reported Level 1 threat. Within this, hunting, killing and collecting terrestrial animals, and gathering terrestrial plants are the commonly mentioned threats. Illegal wildlife trade is a well-known and serious threat to biodiversity and protected areas. In 2008, the combined global value of legally traded commodities derived from wild plants and animals was approximately USD 24.5 billion<sup>7</sup>. In East Asia, economic development has brought a rising demand for exotic and luxury products, including wildlife products, which inevitably create illegal trade markets of these desired goods. Notable examples include the rhino horn, pangolins, bear bile, reptiles, turtles, orchids, corals and sharks (Box 2.1).



## Box 2.1 Illegal hunting and wildlife trade in South-east Asia

High rates of deforestation in South-east Asia have made the remaining forests more accessible to hunters and fueled widespread commercial trade in wildlife and wildlife products. Uncontrolled hunting pressure within protected areas has led to dramatic population declines and extinction of several globally significant wildlife species<sup>18</sup> (Table 2.1). The highly lucrative and largely illegal exploitation of wildlife for commercial trade is fueled by demand for meat, medicines, pets and 'high value' wildlife products such as rhino horn and pangolin scales. Many protected areas in South-east Asia have been unable to withstand hunting pressures associated with escalating market demand for wildlife products. Weak governance regimes associated with poor law enforcement have further increased the vulnerability of protected areas to wildlife exploitation. The severe impacts of the trade are linked to the wide diversity of targeted species and the high volumes of extraction to meet commercial scales of demand<sup>19</sup>.

**Table 2.1** Exploitation-driven declines and local extirpations of globally endangered species from protected areas in South-east Asian countries.

Protected Area	Country	Species	Population decline or extinction	Drivers of exploitation	Source
Cat Tien National Park (Cat Loc)	Viet Nam	Javan Rhinoceros ( <i>Rhinoceros sondaicusannamiticus</i> )	Extirpation of the species	Illegal trade in rhino horn	Brook <i>et al.</i> , 2014
KayanMentarang National Park	Indonesia (Kalimantan)	Hose's langur ( <i>Presbytishosei</i> )	50-80% reduction in population density (1996-2003)	Traditional Chinese medicine	Nijman, 2005
Siberut National Park	Indonesia (Sumatra)	Kloss's gibbon ( <i>Hylobatesklossii</i> )	50% reduction over a 25 year period (1980-2005)	Logging and hunting	Whittaker, 2005
Tonle Sap Biosphere Reserve	Cambodia	Turtles <i>Batagurbaska</i> , <i>Cuora amboinensis</i> , <i>Heosemys annandalii</i> , <i>Malayemys subtrijuga</i>	Catch reduction reported by fishermen- not quantified	Unsustainable exploitation for domestic and international demand	Platt <i>et al.</i> , 2008
Yok Don, Ea So, Cat Tien NP, VinhCuuNR	Viet Nam	Banteng ( <i>Bosjavanicus-birmanicus</i> )	50% reduction (1990-2007)	Hunting for trophies and meat; habitat loss and fragmentation due to roads and dams	Pedrono <i>et al.</i> , 2009
Seima Protection Forest	Cambodia	Tiger ( <i>Panthera tigris</i> )	Extirpation of tiger (2000-2010)	Illegal wildlife trade	O' Kelly <i>et al.</i> , 2011
Hpongkhanrazi Wildlife Sanctuary and Hkakaborazi National Park	Myanmar	Tiger, pangolin, otters, bears (commercially valuable wildlife species)	Reported declines and local extirpations	Hunting for subsistence and trade	Rao <i>et al.</i> , 2010, and 2011
Nam Et PhouLouey National Park	Lao PDR	Ungulates: Gaur, Serow, Wild pig, Sambhar, Muntjac	Low abundance of ungulates, no presence of tiger	Hunting for subsistence and trade	Vongkhamheng <i>et al.</i> , 2013

'Natural system modifications', the second most frequently recorded threat, refers to management interventions, often for human welfare, that can cause habitat degradation and become threats to protected areas. This includes fire and fire suppression, dams and water management or use, fragmentation within protected areas and isolation of protected areas in the wider landscape.

## Box 2.2 Deforestation in South-east Asia

Over the past two decades, the ASEAN region, forecasted to rank as the fourth largest economy in the world, has experienced globally significant rates of economic growth and population expansion<sup>21</sup>. This has placed enormous pressures on the region's natural resources, resulting in brisk and extensive land cover change through globally high rates of deforestation, including within protected areas<sup>22</sup>. Tropical deforestation, unprecedented in scope and scale, has placed protected areas within tropical South-east Asia, a region with exceptionally high levels of biodiversity and endemism, at risk<sup>23</sup>. Global analyses have confirmed that protected areas in South-east Asia have the highest levels of deforestation<sup>24</sup>. In Indonesia, 16% of the total primary forest lost (6.02 million hectares) during 2000-2012 occurred within conservation and protection forests that prohibited clearing<sup>25</sup>. In countries such as Cambodia and Lao PDR, large swathes of land within protected areas have been allocated to economic land concessions (for rubber and oil palm)<sup>26</sup>.

Rapidly growing global markets for commodities such as oil palm and rubber are tightly linked to the growing demand for land and natural resources and intense pressures on protected areas. This escalating demand has resulted in serious infringements on protected areas (Table 2.2) and the rights of resident human communities. Factors such as corruption, political decentralization and lack of land tenure are additional forces driving deforestation both within and beyond protected areas.

**Table 2.2** Deforestation within selected protected areas in South-east Asia

Protected Area	Country	Deforestation Rate	Deforestation Drivers	Source
Gunung Palung National Park	Indonesia (Kalimantan)	1988-2002: 19 km <sup>2</sup> /yr [After 1999: 9.5%/yr <sup>-1</sup> ]	Timber, Oil Palm	Curran <i>et al.</i> , 2004
Multiple protected areas	Indonesia (Sumatra)	1990-2000: 0.03-9.84%/yr <sup>-1</sup>	Timber, Oil Palm	Gaveau <i>et al.</i> , 2009
Four protected areas	Indonesia (Sumatra)	1972-2002: 0.62-2.74%/yr <sup>-1</sup>	Commercial plantations (coffee, pepper, oil palm)	Gaveau <i>et al.</i> , 2007
Pidaung Wildlife Sanctuary	Myanmar	2000: 40% of the park is degraded	Human encroachment, timber and non-timber plantations (rubber)	Oikos, 2011; ICIMOD, 2002; Rao <i>et al.</i> , 2002
Multiple protected areas	Malaysia (Sabah, Sarawak)	1990-2009: 23% PAs in Sarawak and 30% PAs in Sabah are deforested	Timber, Oil palm	Bryan <i>et al.</i> , 2013
Seima Biodiversity Conservation Area	Cambodia	2002-2008/9 Core: 0.16%/yr <sup>-1</sup> (33.6 km <sup>2</sup> ) 10-km buffer: 1.0%/yr <sup>-1</sup> (200 km <sup>2</sup> )	Smallholder clearing, logging (Large agri-business concession and mining licenses have been approved in and around the reserve.)	Slayback and Sunderland, 2013; Evans <i>et al.</i> , 2013; Pollard <i>et al.</i> , 2010
Nam Kading NPA	Lao PDR	2000-2009 Core: 0.1%/yr <sup>-1</sup> (12.9 km <sup>2</sup> ) 10-km buffer: 0.91%/yr <sup>-1</sup> (149 km <sup>2</sup> )	Hydropower development	Slayback and Sunderland, 2013; Hallam and Hedemark, 2013
Cat Tien National Park (Cat Loc)	Viet Nam	2002-2008 Core: 0.32%/yr <sup>-1</sup> (6.4 km <sup>2</sup> ) Buffer: 0.71%/yr <sup>-1</sup> (93.2 km <sup>2</sup> )	Human encroachment, logging, plantations, hydropower development	Slayback and Sunderland, 2013; Polet and Ling, 2004

Agricultural expansion, especially for timber, rubber, and oil palm, has been a major driver of forest loss in many countries (Box 2.2). The two largest oil palm-producing countries—Indonesia and Malaysia—are located in South-east Asia, and oil palm plantations have had an important impact on biodiversity<sup>20</sup>. There are large plantations of oil palm and rubber in many protected areas in the Asia Region. However, in some areas, Sumatra for example, former logging concessions are now being restored (Box 2.3).

### Box 2.3 Harapan Rainforest: Ecological restoration in Sumatra

Over the last century, lowland forest on Sumatra has dwindled from 16 million hectares to a mere 500,000 hectares and the island's lowland forests are still under threat, especially from conversion to oil palm. Although Sumatra has some important conservation areas, most are in hilly regions. Very little lowland forest is protected and even national parks and reserves are threatened by encroachment and illegal logging.

New legislation provides exciting opportunities for enabling production forest, formerly exploited for logging, to be restored and managed for conservation. Harapan Rainforest, 90,000 hectares of commercially valuable lowland forest, is the first former concession to be earmarked for ecosystem restoration. The area is managed by a private partnership consisting of three NGOs: Burung Indonesia; Birdlife International; and the Royal Society for Protection of Birds with a management licence for 100 years. Although a former logging concession, Harapan Rainforest retains some good-quality lowland rainforest. The area supports a rich variety of wildlife, including populations of tigers, clouded leopard, elephants, Malay tapir, six species of primates and at least 235 species of birds including six species of hornbills.

Expansion of the Harapan model to create conservation areas in other sites of production forest could make a significant contribution to Indonesia's efforts to safeguard livelihoods, forests and biodiversity, and to mitigate climate change through reducing greenhouse gas emissions from deforestation and degradation. Harapan Rainforest is not formally designated as a protected area but its management objectives make it equivalent to IUCN category VI. It fits well with the concept of "other conserved areas" protecting important biodiversity as described in CBD's Aichi Biodiversity Target 11.

Source: MacKinnon *et al.* 2012

Among the most pressing challenges for protected areas in the Asia Region today is human-wildlife conflict. As human habitations close to protected areas expand and wild animal populations increase, so do the chances of conflict. Large mammals come into conflict with humans by destroying crops and property, preying on livestock and sometimes even killing people. For example at a study site in Nepal, the average damage by elephants was calculated at as much as 27% of the annual income for each individual household<sup>27</sup>.

Invasive species are also a notable threat to protected areas in the Asia Region and around the world. In Sri Lanka's Bundala National Park, feral dogs have been reported to attack wild animals<sup>28</sup>. Dogs have also been seen searching and feeding on eggs of marine turtles in coastal areas<sup>29</sup>. Several of Nepal's protected areas have been affected by invasive plant species. One of these species is *Mikania micrantha*, first reported in 1963 in eastern Nepal. In the country's Chitwan National Park, *Mikania* covers almost 80% of the buffer zone forests, affecting the forest ecosystem as well as local livelihoods<sup>30</sup>.



Energy production and mining within protected areas has also been reported for several protected areas. For example, the rapid expansion of the mining industry in Mongolia is perhaps the biggest threat to the country's protected areas. Mining has become Mongolia's most important industry and the single most reliable source of revenue. A number of gold mines operate along the rivers that originate from the western slopes of the Khan Khenti Strictly Protected Area (SPA). The mines are in direct conflict with the migratory routes of the threatened Siberian salmon (*Huchotaimen*), locally known as the Siberian Taimen, and have resulted in the destruction of the species' spawning grounds<sup>31</sup>.

## 2.2. CONCLUSIONS AND FUTURE DIRECTIONS

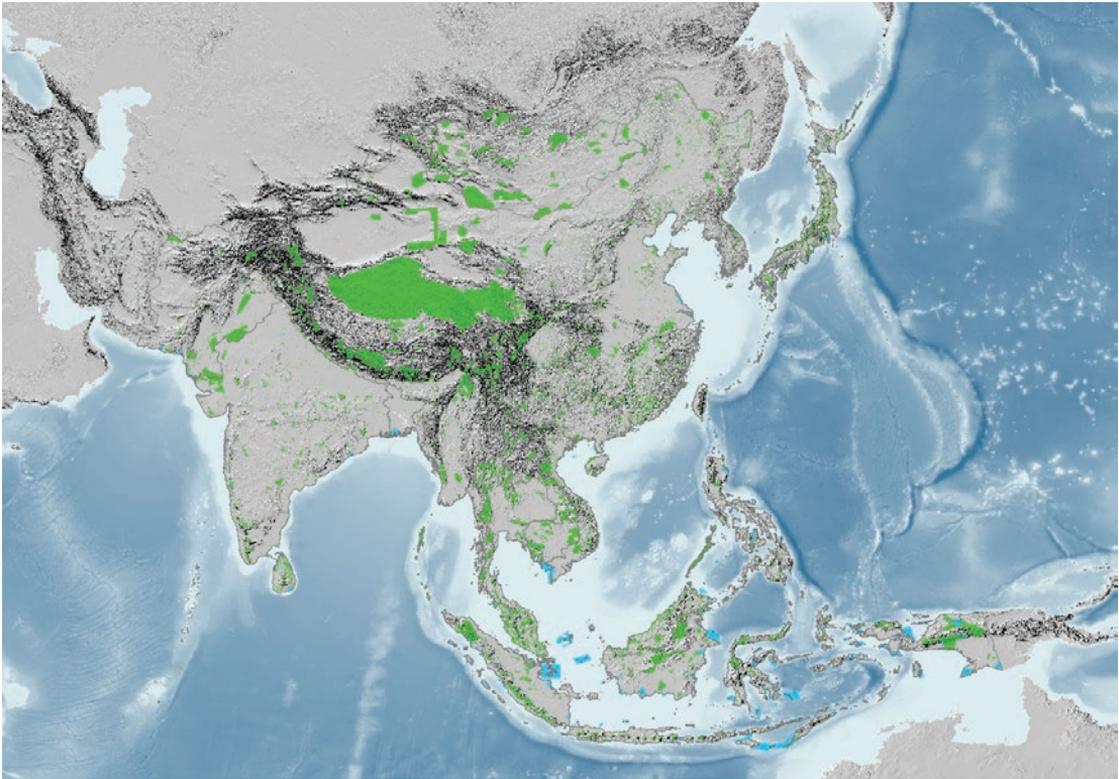
- Main threats to protected areas in the Asia Region are habitat degradation and exploitation due to high population densities (1.5 times the global average) and increasing demands from a globalised market. In consequence, illegal wildlife trade, deforestation, pollution, invasive species, energy production and mining are serious threats that hinder protected areas being effective in conserving biodiversity.
- Deforestation in South-east Asia is resulting in deleterious and irreversible impacts on the integrity of protected areas, and the functioning of their ecosystems. Economic forecasts show tropical deforestation in South-east Asia is expected to continue. It is imperative that urgent and effective steps are taken to reverse tropical deforestation and exploitation trends affecting protected areas, which reduce their efficacy to conserve biodiversity and ecosystem services into the future.
- The illegal trade in wildlife, fueled by growing demand for wildlife and wildlife products, has resulted in significant population declines and extirpations of species leaving some protected areas empty of the biodiversity they were created to protect.
- Site-based strategies include strengthening protected area management and increasing law-enforcement protection at local scales, partnerships with the private sector (e.g., extractive industries), and demand reduction campaigns for wildlife products.
- Policy strategies to tackle threats to protected areas should include policy reforms by government agencies, and more effective implementation of multilateral environmental agreements related to protected areas (eg., Convention on Biological Diversity) and wildlife trade (Convention on International Trade in Endangered Species of Wild Fauna and Flora, CITES).

# 3. Protected Area Coverage

This chapter reports on protected area coverage in the 24 Asia countries included in this study (Figure 3.1, Box 3.1). The most recent study measuring protected area coverage at a regional level for Asia was a gap analyses study published by the ASEAN Centre for Biodiversity in 2010<sup>32</sup> but it was limited to ASEAN countries and only assessed terrestrial coverage for three countries and marine coverage for six. IUCN also produced a regional plan for protected areas management in East Asia<sup>33</sup> which assessed protected area coverage for eight East Asia countries and territories. Similarly, countries have been reporting protected area coverage to the CBD in the year of writing (2014), as part of the national reporting process. Results from these sources are not comparable with the results presented in this report as the methodology and datasets used were different but when relevant, these sources are cited.

In 2014, the global coverage of protected areas reached 15.4% for terrestrial and inland waters and 8.4% of coastal and marine areas<sup>34</sup>. In the Asia Region protected areas coverage grew steadily between 1990 and 2012. However, this growth seems to have slowed down in the past two years (Figure 3.2). In 2014, approximately 10,900 protected areas in the Asia Region, cover 13.9% of terrestrial and inland water areas and 1.4% of marine and coastal areas.



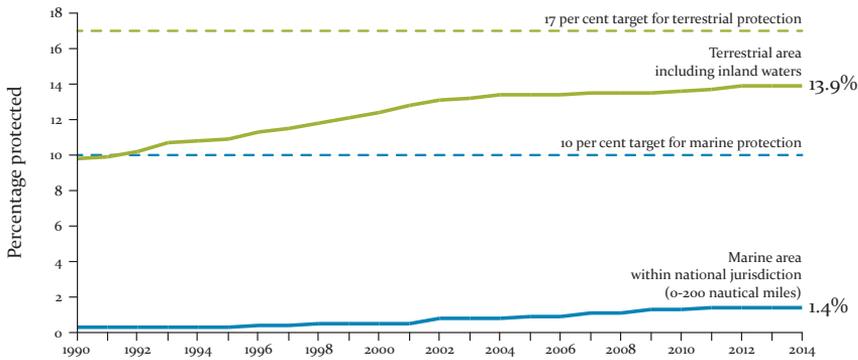


**Figure 3.1** Protected areas recorded in the World Database on Protected areas (WDPA) in the Asia Region in August 2014 Green: terrestrial protected areas; Blue: marine and coastal protected areas as reported to the WDPA. Source: IUCN and UNEP-WCMC 2014.

### Box 3.1 Measuring protected area coverage

Protected area coverage was calculated using all the designated protected areas in the August 2014 version of the World Database on Protected Areas (WDPA). The WDPA underwent a major update in 2014 due to the overwhelmingly positive response to notification SCBD/SAM/DC/RH/83023 sent by the CBD to parties in January 2014, asking for them to submit an update in their protected area data to UNEP-WCMC. In addition, the WDPA Expert Review in Asia project, initiated in 2010 by UNEP-WCMC, the Korea National Park Service (KNPS), ASEAN Centre for Biodiversity (ACB), and IUCN, facilitated capacity building and improved the WDPA data quality in the region.

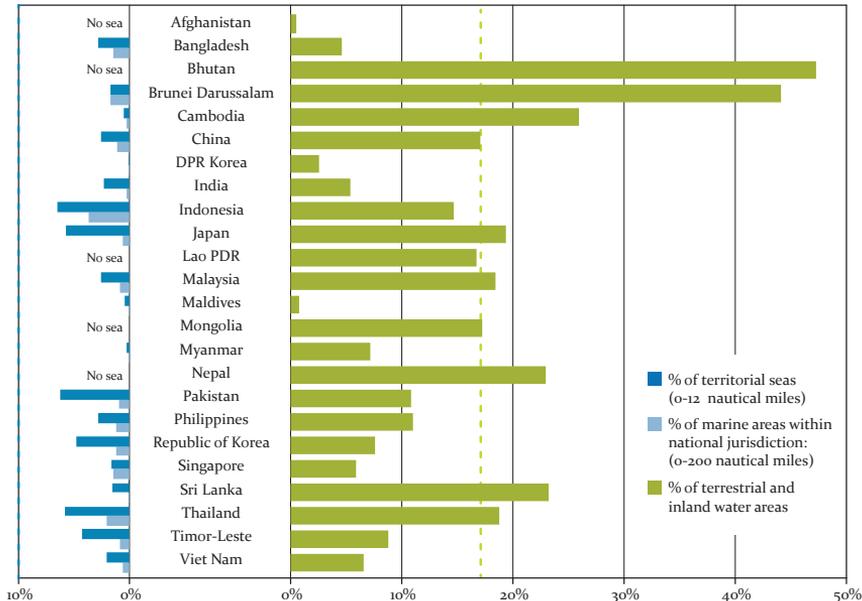
All analyses include all sites designated by countries at a national level (e.g. national park), regional level (e.g. ASEAN Heritage Parks), and under international conventions and agreements (e.g. natural World Heritage sites). The UNESCO Man and Biosphere Reserves have not been included in the calculation of the global coverage statistics as they might include buffer areas that do not meet the IUCN definition of a protected area. Proposed protected areas and protected areas recorded as points without a reported area were also excluded. In addition, all overlaps between different designations types were removed to avoid double counting.



**Figure 3.2** Percentage of all terrestrial and inland water areas and marine and coastal areas covered by protected areas in the Asia Region, 1990 – 2014. Source: UNEP-WCMC 2014b

### 3.1. TERRESTRIAL PROTECTED AREAS

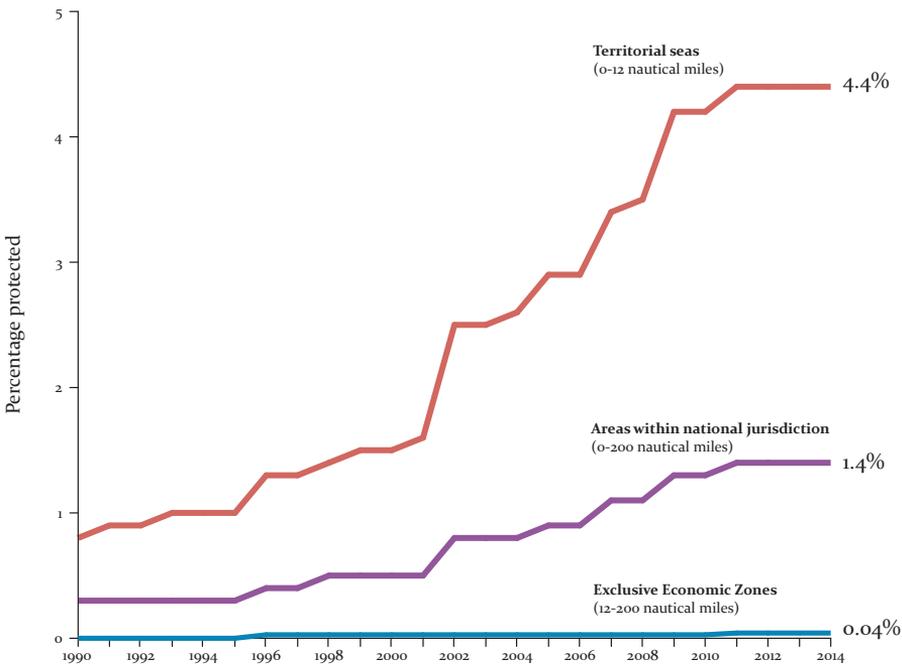
Terrestrial protected areas in the Asia Region cover 2.9 million square kilometers, which is 13.9% of the Asia Region. This means that still an additional 655 thousand square kilometers (an area around the size of Myanmar) of protected areas are needed to meet the 17% coverage in Aichi Biodiversity Target 11. There are strong differences between countries. Some countries like Bhutan and Brunei Darussalam have around 40% of their land protected while 14 countries (58% of countries) have less than 17% of their land covered by protected areas (Figure 3.3), 10 of which (41% of countries) have less than 10% of their area protected. China makes an important contribution to the region’s protected area coverage. For example, in North West China there are four very large protected areas that cover around 766,000km<sup>2</sup> (Kekexili, Qiangtang, Aejinshan, and Sanjiangyuan nationally designated nature reserves). Excluding these areas, the total coverage for the land for the Asia Region would drop from 13.8 to 10.2%.



**Figure 3.3** Percentage of protected area coverage per country for terrestrial and inland water areas and marine and coastal areas for the 24 countries included in this report. Source: UNEP-WCMC 2014b. These statistics might differ from those reported to via the CBD National Reports due to difference in methodologies and datasets used to assess protected area coverage. For example, in 2014, the 5th National Report of the government of Japan to the CBD reported a protected area coverage of 20.3% of the land and 8.3% of the seas within national jurisdiction. See: [www.cbd.int/doc/jp/jp-nr-05-en.pdf](http://www.cbd.int/doc/jp/jp-nr-05-en.pdf)

### 3.2. MARINE PROTECTED AREAS

Although protected area coverage in the Asia Region grew steadily between 1990 and 2010, coverage of protected areas in the seas of the Asia Region is still very low at 1.4% (268,000 km<sup>2</sup>) and seems to have slowed down since 2010 (Figure 3.4). Most protected areas are located in territorial seas (0-12 nautical miles) of which 4.4% is covered by protected areas. In contrast, only 0.04% of countries' Exclusive Economic Zones (12-200 nautical miles) are under protected areas. To have at least 10% of the territorial seas covered by protected areas, the 19 countries with coastal and marine areas would have to increase marine protected area coverage by around 1.6 million square kilometers, an area a bit larger than the size of Mongolia. Coastal and marine protection per country is also very low with no countries covering at least 10% of their marine area within national jurisdiction (0-200 nautical miles). Only four countries, Indonesia, Japan, Pakistan, and Thailand, have more than 5% of their territorial seas covered by protected areas (Figure 3.3).



**Figure 3.4**  
Protected areas coverage for coastal and marine areas, subdivided by terrestrial seas, Exclusive Economic Zones, and areas within national jurisdiction.  
Source: UNEP-WCMC 2014b

### Box 3.2 ASEAN Heritage Parks

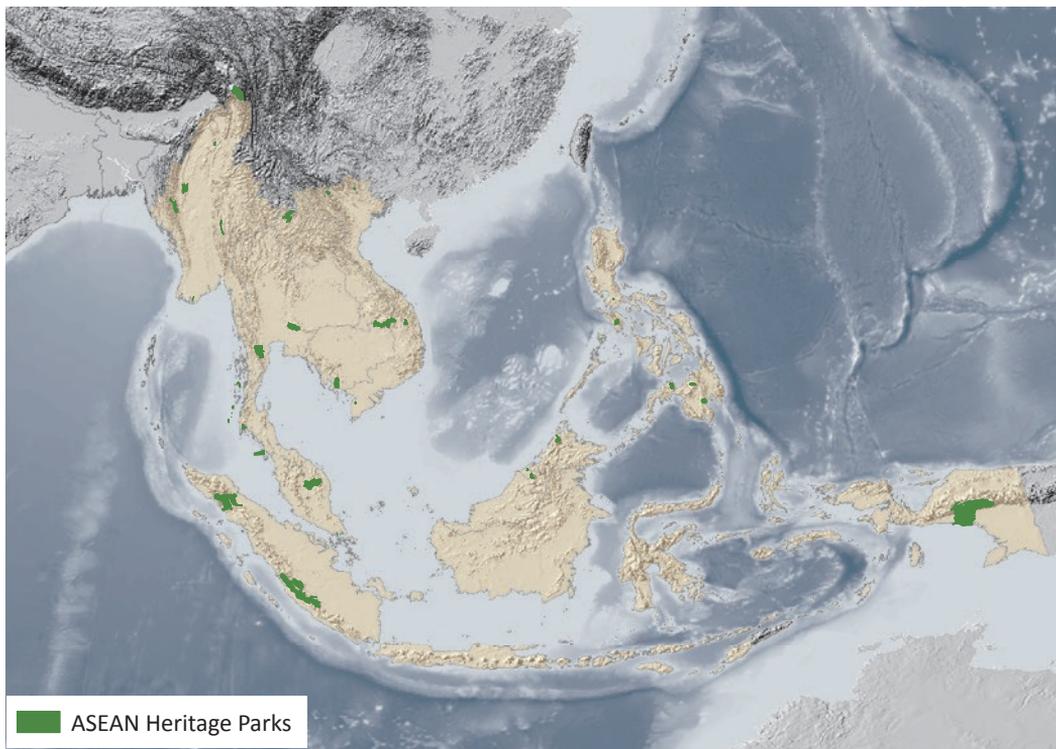
**Monina Uriarte\***

The ASEAN region has more than 1,300 national parks. Recognizing that conservation areas should be managed to maintain ecological processes and life support systems; preserve genetic diversity, ensure sustainable utilization of species and ecosystems; and maintain wilderness that is scenic, cultural, educational, research, recreational and tourism values, ASEAN Heritage Parks (AHPs) were established.

AHPs are not new protected areas; instead they are selected national parks and reserves in the region known for their uniqueness, diversity and outstanding values. Their importance as conservation areas deserves the highest recognition regionally and internationally<sup>35</sup>.

In 2013, a total of 33 AHPs had been named since 1984. These are distributed across 10 countries as follows: Brunei Darussalam (1), Cambodia (2), Indonesia (3), Lao PDR (1), Malaysia (3), Myanmar (7), Philippines (5), Singapore (2), Thailand (4), and Viet Nam (5). Out of these 33 AHPs, 25 are terrestrial, 4 are wetlands, 3 are marine and coastal, and 1 is peatland.

\*ASEAN Centre for Biodiversity



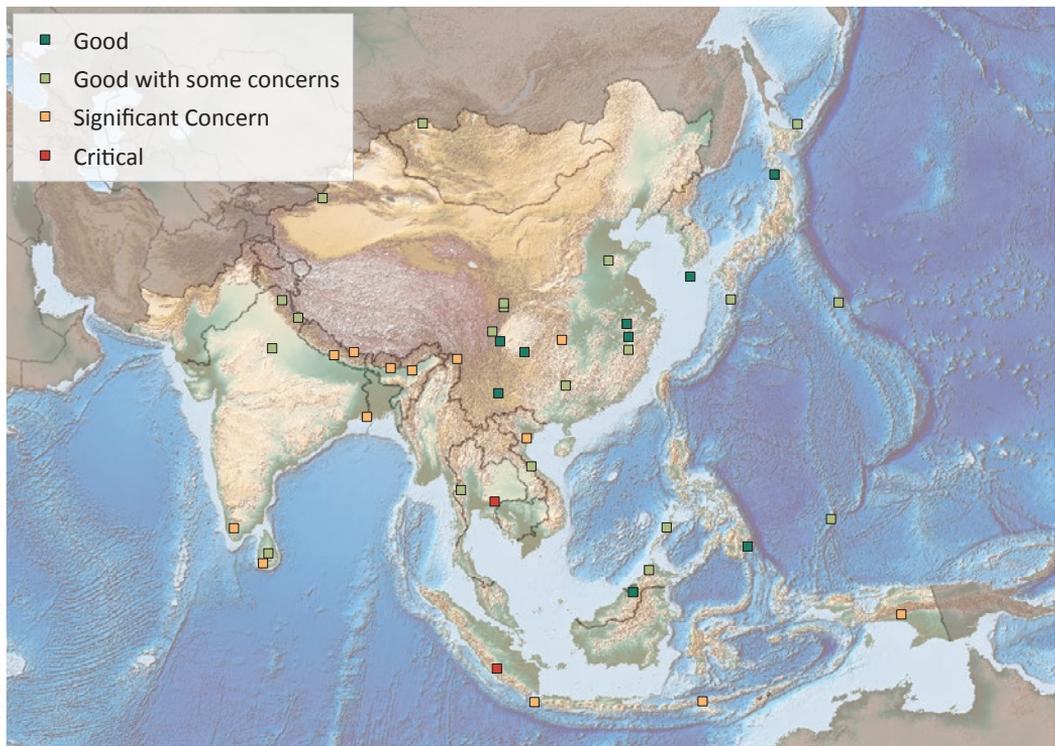
### 3.3. INTERNATIONAL DESIGNATIONS

The 24 Asia countries covered in this report have 266 sites designated under international conventions and agreements of which 45 are natural and mixed World Heritage sites and 221 Ramsar sites. A recent assessment of the status of World Heritage sites showed that two thirds of the sites were in a good condition (Box 3.3).

#### Box 3.3 Outlook for natural World Heritage in Asia

Elena Osipova and Yichuan Shi\*

The IUCN World Heritage Outlook is the first global assessment of natural World Heritage, tracking the conservation of listed natural sites on a regional as well as global scale. This new system looks at the potential for each natural site to maintain its Outstanding Universal Value over time, based on three elements: the state and trend of values; threats and protection and management. This gives an indication of whether its Conservation Outlook is: “good”, “good with some concerns”, of “significant concern” or “critical”.



**The results show that two thirds of natural World Heritage sites in Asia have a positive outlook** (either “good” or “good with some concerns”). These can serve as strong examples of good practice that could be shared across the region and across all types of protected areas. The outlook also highlights illegal logging and poaching, impact of dams and road infrastructure development as the biggest threats that need to be addressed in Asia to improve the status of natural World Heritage sites.

The goal of the IUCN World Heritage Outlook is to improve the conservation of natural World Heritage sites and strengthen the World Heritage Convention. It aims to recognize well-managed sites, identify the most pressing conservation issues and promote action to achieve a good Conservation Outlook across all sites.

All Conservation Outlook Assessments are available online at [www.worldheritageoutlook.iucn.org](http://www.worldheritageoutlook.iucn.org). The website is open to feedback and assessments and updated regularly.

\*IUCN World Heritage Programme

### 3.4. CONCLUSIONS AND FUTURE DIRECTIONS

- Terrestrial and inland waters protected areas cover 13.9% of the Asia Region. Although some countries have at least 17% of the land covered by protected areas, more than half of the Asia countries do not. For those countries for which there had been previous analyses, there has been no significant progress in protected areas expansion since 2010, which seems to indicate that positive trends measured since 1990 have slowed down.
- Protected area coverage is very low for marine and coastal areas within national jurisdiction (1.4%) and critically low in the marine areas between 12 and 200 nautical miles (0.04%). No country has at least 10% of their marine area within national jurisdiction covered by protected and only four countries have more than 5%.
- To meet Aichi Biodiversity Target 11 by 2020, governments should focus their efforts in increasing protected area coverage by expanding existing protected areas or creating new ones and with special attention to the coastal and marine environment. In total 655 thousand square kilometers of terrestrial and inland waters area (an area around the size of Myanmar) and 1.6 million square kilometers of coastal and marine areas (an area a bit larger than the size of Mongolia) will need to be designated to cover at least 17% and 10 % respectively.
- However, protected areas expansion need to be targeted to specific places. Aichi Biodiversity Target 11 calls for a global protected area network that covers areas importance for biodiversity and ecosystem services and is ecologically representative. It is crucial that governments and organizations involved in the expansion of protected areas in the Asia Region consider these conditions (see Chapter 4).





## 4. Protection of Biodiversity and Ecosystem Services

The establishment of new protected areas and the expansion of existing ones has not always targeted the most important areas for biodiversity, often favoring remote areas with low production value<sup>36</sup>. Aichi Biodiversity Target 11 calls for protected areas to cover areas of importance for biodiversity and ecosystem services and to be ecologically representative. This chapter assesses whether the current protected area network of the Asia Region meets these demands. First, we look into how much of the important areas for biodiversity and ecosystem services are covered by protected areas; second, we measure the proportion of Asian marine and terrestrial ecoregions that are under protected areas.

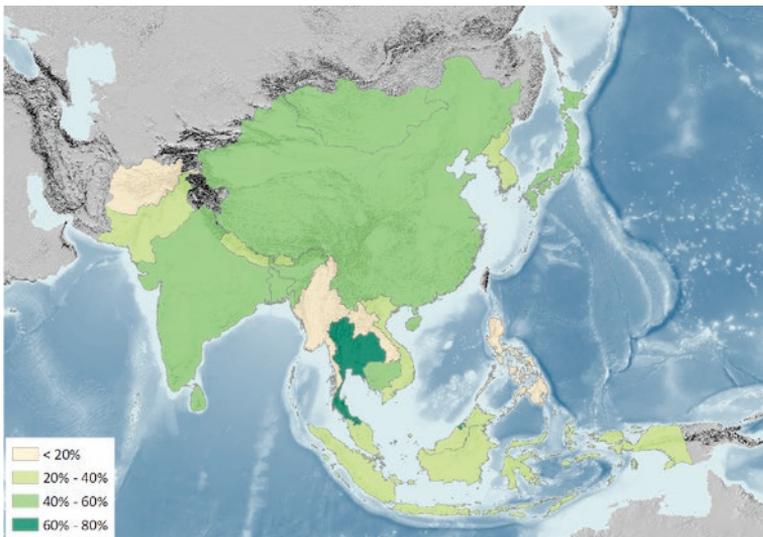
## 4.1. PROTECTED AREA COVERAGE OF AREAS OF IMPORTANCE FOR BIODIVERSITY AND ECOSYSTEM SERVICES

The Asia Region is home to a breathtaking reservoir of biodiversity. It not only includes five megadiverse countries (India, China, Malaysia, Philippines and Indonesia)<sup>37</sup>, but also holds renowned global biodiversity “hotspots” as the Mountains of Central Asia, Indo-Burma, Western Ghats and the Eastern Himalayas<sup>38</sup>. South-east Asian forests are spectacularly diverse, with many endemic birds, mammals and plants<sup>39</sup> and globally significant terrestrial carbon sinks<sup>40</sup>. The seas of the Asia Region are also rich in species and ecosystems<sup>41</sup>. The coral triangle region, for example, has the most diverse corals, reef fish, mangroves and sea grass of anywhere on earth<sup>42</sup>. It has large freshwater systems such as the Ganges, the Brahmaputra Yangtze, and the Mekong rivers that are rich in freshwater biodiversity on which many local communities depend. The Indo-Burma “hotspot”, for example, holds an important diversity of freshwater fish with more than 1,000 species<sup>43</sup>. Annual production in the Mekong river basin can amount to 2.1 million tonnes of freshwater fish, worth USD 2.1–3.8 billion, and it is the main source of income for 22 million people in Cambodia and Lao PDR<sup>44</sup>.

### *Biodiversity*

One way to identify areas of importance for biodiversity is to use the Key Biodiversity Areas (KBAs) approach. KBAs, pioneered by BirdLife International, identify sites of international significance for the global persistence of biodiversity by using globally standardised criteria and thresholds applied by national and international organizations<sup>45</sup>. The most notable examples of KBAs are Important Bird Areas (IBAs) and Alliance for Zero Extinction sites (AZEs). AZEs are sites that hold 95% of the global population of a Critically Endangered or Endangered species according to IUCN Red List of Threatened Species<sup>46</sup>.

There are 1,937 IBAs and 98 AZEs in the Asia Region making a total of 2,035 sites. Only 16% (326) of IBAs and AZE sites are completely covered by protected areas (whole site under a protected area designation)<sup>47</sup>. China and Sri Lanka have the highest proportion of sites completely protected - 34% and 47% respectively. Although most countries have more than 20% of their important sites covered by protected areas, there are no countries whose entire KBAs network is protected (Figure 4.1).



**Figure 4.1** Mean percentage area of IBAs and AZEs covered by protected areas in the Asia Region. Source: Butchart et al., in review.

IUCN has developed a methodology to identify Important Freshwater Areas for several regions of the world<sup>48</sup>. In the Asia Region, candidates to become freshwater KBAs have been identified in the Western Ghats, Indo-Burma, and Eastern Himalayas biodiversity hotspots in Asia<sup>49</sup>. Stakeholder consultations validate candidate KBAs and identify focal areas have been conducted for freshwater KBAs in Western Ghats. A freshwater KBA Focal Area is a distinct area (e.g. lakes, headwater streams or springs) within the KBA that is of particular importance for one or more of the species that meet the KBA criteria.

Results show that most of the freshwater KBAs and KBA Focal Areas (some of which are Alliance for Zero Extinction sites) have little or no overlap with the existing protected areas. Only one KBA Focal Area (in the Moyar River KBA) is fully incorporated into the protected area network, and the Focal Areas of the Upper Vaigai River and the Periyar KBAs are mostly covered (see Box 4.1). The remaining KBA Focal Areas receive very little protection from protected areas, especially in lowland and coastal areas<sup>50</sup>. Despite the importance for freshwater ecosystems in the region, with several highly diverse large river systems (e.g., Mekong River, Brahmaputra River and Yangtze river) on which millions of people depend, no comprehensive assessment of protected area coverage of freshwater biodiversity has been completed.

#### Box 4.1. Prioritizing freshwater fish conservation in Western Ghats Hotspot: Alliance for Zero Extinction (AZE) sites

Sanjay Molur\* and Rajeev Raghavan\*\*

The rivers draining the Western Ghats Biodiversity Hotspot in India harbour an extraordinary diversity (~335 species) and endemism (65%) of freshwater fishes, many of which occur inside the terrestrial protected area (PA) network that dots the landscape. The number of freshwater fish species that occur in some of these PAs probably far exceeds those of mammals, birds and reptiles. Yet, protected areas in the Western Ghats and the rest of India rarely acknowledge the importance, or need for conserving freshwater fish. This is worrying as some of these PAs are potential freshwater 'Alliance for Zero Extinction (AZE)' sites, i.e. sites that harbour 95% of the population of one or more 'Critically Endangered' and/or 'Endangered' species.

The Periyar Tiger Reserve (PTR), an IUCN category II Protected Area, is one such site. Although the PTR is globally renowned for its large mammal diversity, and particularly its tiger conservation efforts, the reserve harbours an exceptionally high diversity of endemic and threatened freshwater fishes, unmatched anywhere in South Asia, and as such qualifies as a unique hotspot. However, this importance of PTR in combating global freshwater fish extinctions has gone largely unnoticed and unrecognized the broad catchment area feeding into the Periyar Lake with several primary and secondary order streams is the last refuge for one genus, *Lepidopygopsis*, and eight species of freshwater fish<sup>51</sup>.

Three of these eight endemic species are categorized as 'Endangered' in the IUCN Red List of Threatened Species thus triggering the Alliance for Zero Extinction (AZE) criteria, and qualifying PTR as an AZE site, representing high conservation priorities. Although these eight endemic species are 'protected' in view of their occurrence inside the boundary of the reserve, no species specific, or general 'fish' conservation efforts are in place. On the other hand, there are several stressors that threaten the survival of these endemic species, including the introduction, escape and proliferation of exotic species, unmanaged harvests and pollution.



Several research and outreach organizations are now working together to eliminate the existing threats and conserve the endemic species of this reserve. This effort is coordinated by the Indian Alliance for Zero Extinction (In AZE) based at the Zoo Outreach Organization (ZOO), Coimbatore, India, and the South Asia office of the IUCN SSC/WI Freshwater Fish Specialist Group (FFSG). A project funded by the Critical Ecosystem Partnership Fund (CEPF) has helped to improve awareness, capacity building, monitoring and policy interventions for freshwater fish species, and has led to the listing of PTR as India's first 'Freshwater Alliance for Zero Extinction site'. A unique participatory campaign was organized in April 2013 to eradicate the African Catfish, *Clarias gariepinus*, the most important alien species in the water bodies of the reserve, which resulted in the capture and removal of 92 individuals.

\*Zoo Outreach Organization (ZOO), Coimbatore, India

\*\*Conservation Research Group (CRG), St. Albert's College, Kochi, India

Formal designation as state-managed protected areas may not be appropriate for all unprotected KBAs. Some may be better managed by local communities, or maintained through sustainable agriculture or other land use practices. However, coverage of KBAs has been used as an indicator by the Convention on Biological Diversity to measure progress towards meeting Aichi Biodiversity Target 11<sup>52</sup>. Key Biodiversity Areas can also contribute to meeting other Aichi targets<sup>53</sup>, especially target 12 that calls for conservation of globally threatened species, which is one of KBA selection criteria. Some Asian countries, such as the Philippines<sup>54</sup>, have used KBAs to inform their national biodiversity strategies in protected area gap analyses. The Critical Ecosystem Partnership Fund<sup>55</sup> and the ASEAN Centre for Biodiversity<sup>56</sup> have also used KBAs to help define their priorities.

A global consultation to consolidate and harmonise these and other KBA approaches into one global 'standard' has been completed and testing is well advanced<sup>57</sup>. A global standard on KBAs will avoid confusion between policy makers and provide a standardised set of criteria to identify KBAs for all taxonomic groups in freshwater, marine and terrestrial biomes.

### *Ecosystem services*

Biodiversity underpins the services that ecosystems provide to humanity<sup>58</sup>. These include food, water, energy, food, and less tangible benefits such as spiritual and cultural services. Protected areas deliver ecosystem services among many other benefits. These include mitigating and adapting to climate change, providing drinking water<sup>59</sup>, food supply, poverty reduction, disaster mitigation (see Chapter 8), cultural and spiritual benefits, and human health<sup>60</sup>.

There are many examples of protected areas protecting important ecosystem services in the Asia Region. The Sanjay Gandhi National Park (IUCN category II) in Mumbai, India; Gunung Gede Pangrango and Gunung Halimung (IUCN category II) near Jakarta, Indonesia; and Kirthar National Park (IUCN category II) and five other wildlife sanctuaries near Karachi, Pakistan, all provide freshwater sources for these cities. Areas of importance for biodiversity often also provide important ecosystem services<sup>61</sup>. For example, an assessment of the ecosystem services conducted in Nepal provided by 27 areas of importance for biodiversity, 14 of which were fully protected, demonstrated the importance of these for the local economy (Box 4.2).

While it is clear that protected areas deliver ecosystem services among many other benefits, developing an indicator that measures trends and progress in level of protection of these remains a challenge. No systematic study assessing the delivery of ecosystem services by protected areas in the Asia Region has yet been completed. Similarly, there is no regional scale or national study that assesses where areas of importance for ecosystem services are located and to what extent they are protected.

## Box 4.2 Measuring the benefits that Protected Areas provide to people: an example from Nepal using a new rapid tool – TESSA

Jenny Merriman\*

The Toolkit for Ecosystem Service Site-based Assessment (TESSA) is a new tool that guides local non-specialists through cost-effective and accessible methods for identifying which ecosystem services may be important at a site. It also evaluates the magnitude of benefits that people obtain from sites currently, and compares these with those expected under alternative land-uses. Thus, TESSA provides valuable information for decision-making about the benefits that sites, such as protected areas, provide to people and the impacts of potential alternative land uses<sup>62</sup>.

In 2012, Bird Conservation Nepal (BirdLife in Nepal) conducted a rapid appraisal of Nepal's 27 Important Bird and Biodiversity Areas (IBAs), 14 of which are wholly within protected areas. Coverage of protected areas in Nepal is already well above that set by Aichi Biodiversity Target 11 (see Chapter 3). 80% of the IBA network overlaps with the protected areas network.



The report demonstrated Nepal's protected IBAs are currently providing a wide range of benefits to people at the local, national and global levels. For example, many of the protected IBAs (e.g. Chitwan National Park and Annapurna Conservation Area) are popular destinations for recreation and tourism, providing important sources of national and local income (e.g. through creating local jobs, supporting national businesses and generating spending in the wider economy), and this service is expected to increase by

2020<sup>63</sup>. However, the status of habitats and populations of bird species at these sites has declined in recent years, as a result of increased pressures on land use such as human disturbance, residential and commercial development, overharvesting of resources and poor water management or use. This has direct impacts on the ecosystem services that these areas can provide. The report presented a number of recommendations to the Government of Nepal. One was to examine the distribution of ecosystem service benefits in more detail at these sites to establish ecosystem service-based development initiatives. These initiatives will have to maximise and redistribute benefits in ways that are sustainable, equitable, reduce pressures on biodiversity and incentivise conservation. Another recommendation was to develop community-NGO-Park Authority collaborations to ensure regular monitoring of biodiversity and ecosystem services, facilitating reporting on trends and management effectiveness. Exploring the possibility of establishing Conservation Areas that retain the rights of the local community forest user groups, while allowing income generation from well-managed tourism was also recommended.

TESSA is also designed to be applied through rapid on-the-ground field assessments to collect quantitative data on the most important services at a particular site, the pressures on these services and the resulting impacts on people as a result of land use change<sup>64</sup>. The tool provides low-cost methods and guidance on the assessment and valuation of ecosystem services at the site-scale. It can be used to provide information to decision-making processes in order to support better conservation of sites and biodiversity while providing sustainable ecosystem services to people.

\*BirdLife International

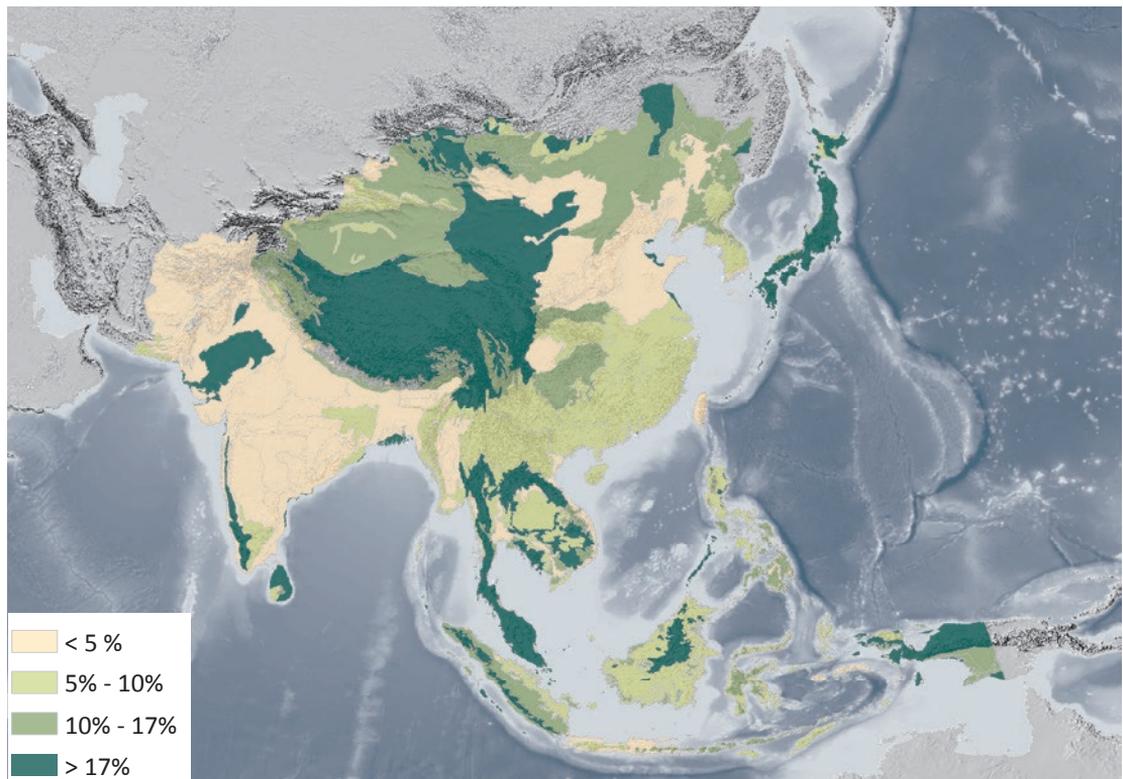
## 4.2. PROTECTED AREA COVERAGE OF TERRESTRIAL AND MARINE ECOREGIONS

Biodiversity is not evenly spread around the world. Patterns of distribution of species and ecosystems respond to specific climatic and geological conditions and have adapted to these throughout millennia. Through the study of these patterns, known as biogeography, a number of ecoregions, covering the whole world, have been defined<sup>65</sup>.

To measure how ecologically representative the Asia Region protected area network is, we assessed the proportion of terrestrial and marine ecoregions covered by protected areas. We use Aichi Biodiversity Target 11 to set a desired target of 17% of protected area coverage for terrestrial ecoregions of the world<sup>66</sup> and 10% target for marine ecoregions of the world<sup>67</sup>. Ecoregions are large areas that have distinct biodiversity values and as such, they do not provide enough level of detail to inform national scale planning. They can however be used as useful proxies for assessing ecological coverage at large scales.

### *Terrestrial ecoregions*

Only 33.5% of the terrestrial ecoregions have at least 17% their area covered by protected areas (Figure 4.2). Of the 209 terrestrial ecoregions that overlap with the Asia Region, 139 have less than 17% of their area covered by protected areas with 103 ecoregions (49%) below 10%. Some ecoregions such as the Northeast India-Myanmar pine forests or the South China Sea Islands have less than 0.1% of their area under protected areas. Conversely, 11 terrestrial ecoregions have more than 50% of their area covered by protected areas, notable examples are Palawan rain forests (82%), Sayan Intermontane steppe (96%), or North Tibetan Plateau-Kunlun Mountains alpine desert (67%).



**Figure 4.2** Percentage of protected area coverage for terrestrial ecoregions of the world in the Asia Region, 2001. Source: UNEP-WCMC 2014b. Terrestrial Ecoregions according to Olson et al. 2001.

## Marine ecoregions

Of the 39 marine ecoregions in the Asia Region, only six (15.4%) have at least 10% of their area under protected areas: Banda Sea, Central Kuroshio, Lesser Sunda, Northeast Sulawesi, Ogasawara Islands, and Papua. Currently, 30 marine ecoregions have less than 5% of their area protected.

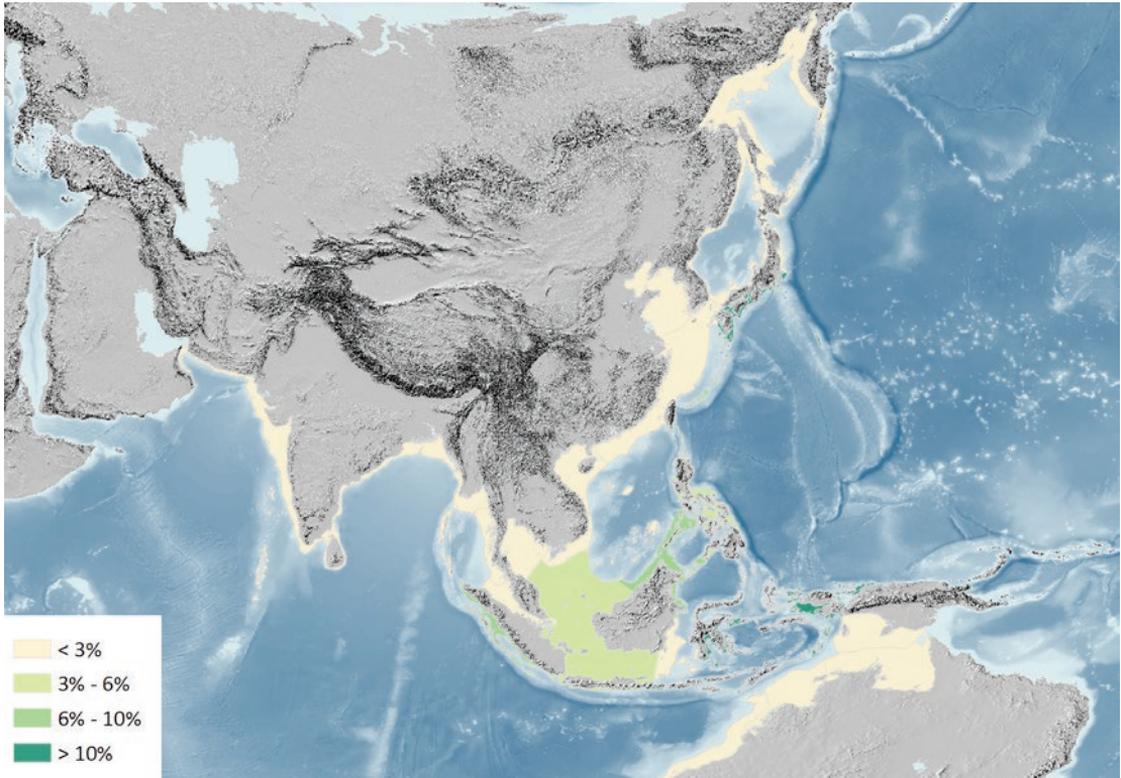
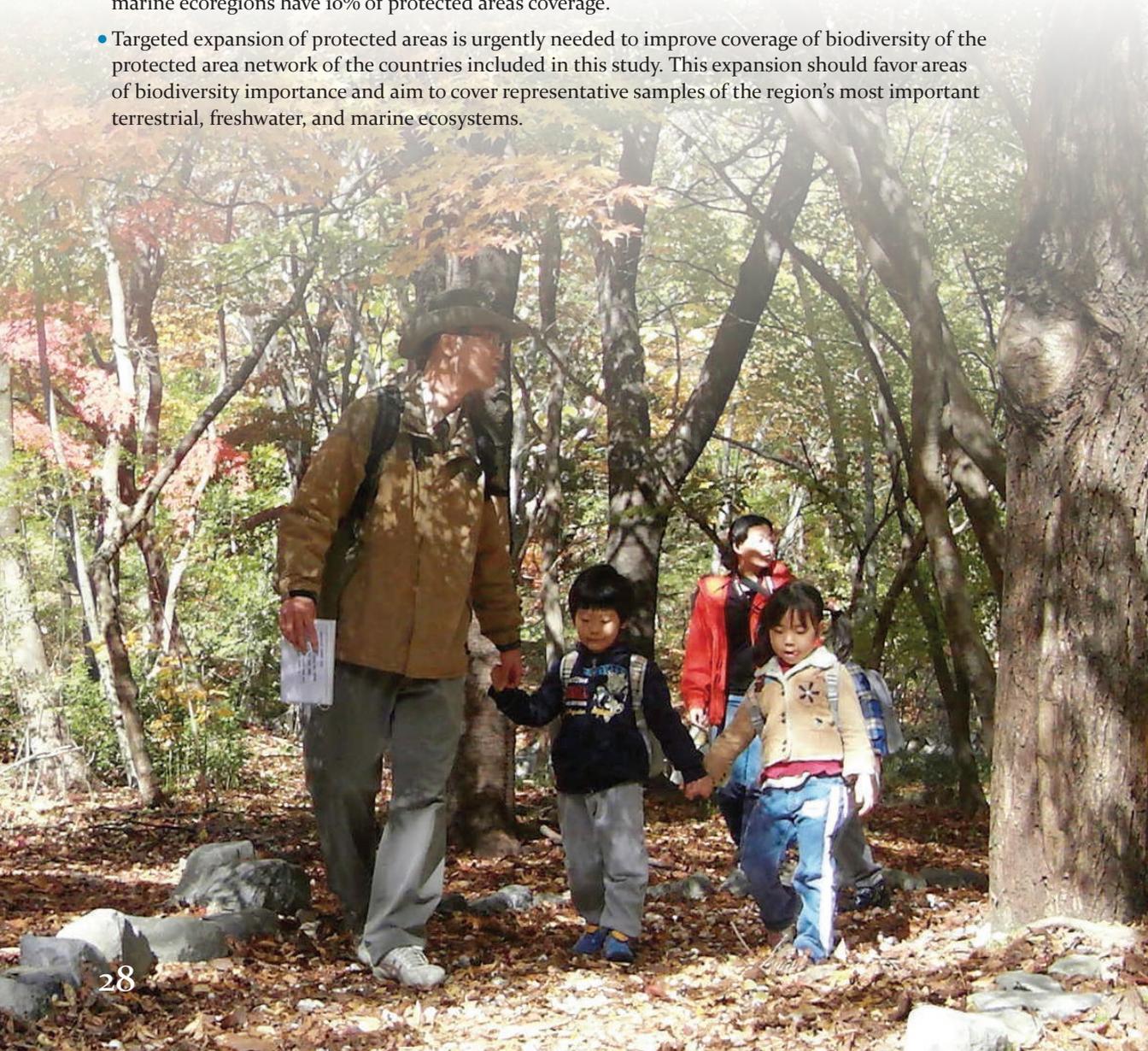


Figure 4.3 Percentage of protected area coverage of marine ecoregions of the world in the Asia Region. Source: UNEP-WCMC 2014b. Marine ecoregions according to Spalding et al. 2007.

### 4.3. CONCLUSIONS AND FUTURE DIRECTIONS

- The Asia Region is home to a breathtaking reservoir of biodiversity with five megadiverse countries and global biodiversity hotspots as the Mountains of Central Asia, Indo-Burma, Western Ghats or the Eastern Himalayas. Species diversity and endemism are particularly high in South-east Asian forests, coral reefs, mangroves, and freshwater systems.
- Only 16% (326) of Important Bird and Biodiversity Areas and Alliance for Zero Extinction sites are completely covered by protected areas (whole site under a protected area designation). There is not enough information to assess protected area coverage of freshwater ecosystems but preliminary assessment of coverage of freshwater KBAs reveal that coverage might be very low.
- Areas of importance for biodiversity often also provide ecosystem services and there are many examples of protected areas currently protecting critical ecosystem services. However, there is no regional scale or national study that assesses where areas of importance for ecosystem services are located and to what extent they are covered by protected areas.
- Terrestrial and marine ecoregions are not well represented in the Asia Region's protected area network. 33.5% of terrestrial ecoregions have at least 17% of their area covered by protected areas. Only 15.4% of marine ecoregions have 10% of protected areas coverage.
- Targeted expansion of protected areas is urgently needed to improve coverage of biodiversity of the protected area network of the countries included in this study. This expansion should favor areas of biodiversity importance and aim to cover representative samples of the region's most important terrestrial, freshwater, and marine ecosystems.



## 5. Protected Area Management

Establishing protected areas is not enough to ensure long-term protection of biodiversity, and both protected area managers and other conservation professionals have expressed concerns that protected areas globally may not be achieving the conservation objectives they were established for<sup>68</sup>. Aichi Biodiversity Target 11 calls for effectively managed protected areas as a key element to achieve CBD's objectives for protected areas. Effective management has two important elements. Firstly, how well protected areas are being managed from the point of view of inputs (resources, planning, and process) to ensure effective implementation. Secondly, how effective protected areas are in terms of delivering outcomes for biodiversity, and thus preventing loss of ecosystems, species, and genetic diversity. This chapter briefly describes Asia's rich history in protected area management, outlines management approaches to protected areas in the region, and reviews the region's progress towards management effectiveness targets.



## 5.1. HISTORY OF PROTECTED AREA MANAGEMENT IN ASIA

Scholars such as Confucius in China emphasized the value of forests and the need to conserve them. This thinking led to the development of temple gardens, restricted hunting areas and forests which have records dating back over 2,500 years. In the Korean peninsula, conservation efforts date back to the reign of King Jinheung (540-576 AD) of the Sinra Dynasty who promoted areas of scenic beauty. The first references to wildlife conservation in Japan are found from the 7th century AD when the Japanese Emperor established a separate section for “bird hunting and preservation” in the Imperial Government. In Mongolia, the practice of protecting some forested hills as sacred places goes back to the 13th century. Its first reserve, the Boghdkhan Mountain Strictly Protected Area, was established in the late 1700s<sup>69</sup>.

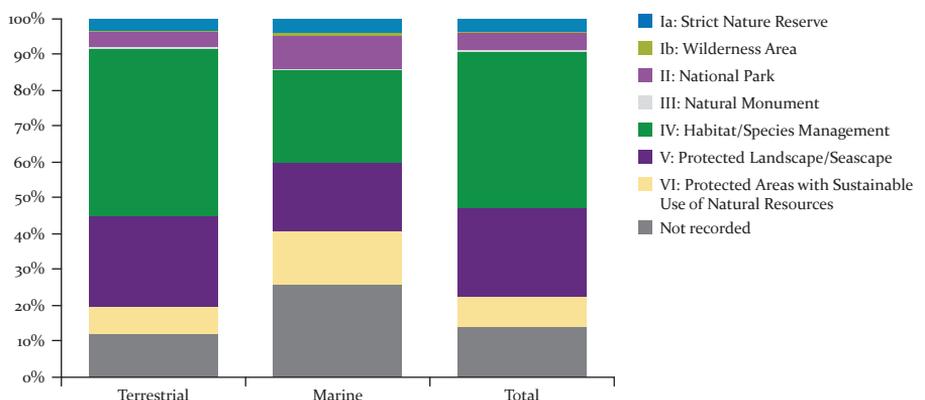
A long history of traditional conservation practices and systems in this region has been recorded<sup>70</sup>. People in East Asia have always been aware of the significance of natural resources and the need to conserve them. This awareness may have come from the need to conserve areas for their aesthetic value more than their conservation value<sup>71</sup>. Many species and areas have also been conserved in the region over time for their cultural and religious significance. For example, in many parts of the Himalayan region *Beyuls* or sacred hidden valleys are found. *Beyuls* are sacred sites which often harbour significant biodiversity values. At least three of the Nepali Himalayan national parks (Makalu Barun, Sagarmatha, and Langtang National Park) have been superimposed on existing *beyuls*, along with one of the three conservation areas (Manaslu Conservation Area)<sup>72</sup>.

## 5.2. APPROACHES TO PROTECTED AREA MANAGEMENT

Using a globally agreed and standardized methodology to classify protected areas allows analyses of trends on protected area management at national, regional and global levels. The IUCN Protected Areas Management Categories<sup>73</sup> (see Box 1.2) are assigned by federal, national or regional authorities and although their use is not compulsory, it is recommended by the CBD (See Box 1.2).

The WDPA records whether an IUCN Management Category has been assigned to a given protected area. Around 86% of protected areas in the Asia Region have been assigned an IUCN Management Category which provides the best available picture of what protected areas are being managed for in the Asia Region (Figure 5.1). However, no IUCN Management Category has yet been assigned to 12.2% of terrestrial and 26% of marine protected areas. Marine and terrestrial protected areas in the Asian region are mainly classified as IUCN Protected Area Management Category IV (Habitat/Species Management), V (Protected Landscape/Seascape) and VI (Protected areas with sustainable use of natural resources) with 77% of protected areas accounting for these three management categories. Most (72%) of terrestrial protected areas in the region are Categories IV and V, and almost half (45.6%) of terrestrial protected areas are Category IV. Similarly, Categories IV, V, and VI together, account for 60% of marine protected areas. Category IV is also the most commonly assigned for marine protected areas (25.8%).

**Figure 5.1**  
Percentage (in number) of IUCN Protected Area Management Categories in the Asia Region for each marine and terrestrial protected area.  
Source: UNEP-WCMC 2014b



Protected area management today needs an integrated approach considering a wide spectrum of ecological and social science disciplines<sup>74</sup>. In East Asia for example, it was found that a number of skills were needed to achieve good protected areas management<sup>75</sup>. These included management skills specifically for strategic planning and financial management; cultural and social expertise for better partnerships; conflict resolution skills combined with networking to address issues relating to a range of different stakeholders and technical skills for better project design, report writing, and information technology. Finally, policy expertise that included an understanding of the broader legal framework and other sectoral policies that are relevant for protected area management was needed. Sound management of protected areas can tackle important issues that are particularly serious to protected areas in Asia such as illegal wildlife trade. Regulated and sustainable trade of species and protected areas combined can sometimes be crucial to protect valuable species (Box 5.1).

### Box 5.1 Safeguarding commercially valuable Argali through Protected Area networks

Claire McLardy\*

*Ovis ammon* (the Asian wild sheep or Argali) is highly prized as a trophy animal. Argali trophies were the most highly traded CITES-listed mammal hunting trophies exported from the Asian region during 2003-2012. According to the CITES Trade database<sup>1</sup>, wild-sourced trophies were exported predominantly from Mongolia (566 trophies plus five horns and two skulls) and China (79 trophies). Argali occur over a large geographic range throughout Central and Inner Asia, although populations are separated. The global population is declining, and the species is categorised as “Near-Threatened”<sup>76</sup>.



In Mongolia, government estimates suggest that the population declined from 50,000 in 1975 to 13-15,000 in 2001, and has become fragmented overall<sup>77</sup>. As a result, the species is listed as Endangered on the Mongolian Red List<sup>78</sup>. More recent national surveys suggest that 19,000-26,000 Argali may persist<sup>79</sup>. The main threat to Argali in Mongolia is poaching for subsistence (meat) and for their horns, which may be used in traditional East Asian medicines<sup>80</sup>.

Protected areas have contributed to the conservation of Argali across the species range through legal protection from persecution and direct habitat destruction. In Mongolia, Argali occur in twelve federal protected areas covering approximately 14% of the species' range. Some reports suggest that protected areas may be the only long-term option for the protection of the species<sup>81</sup>. However, they may be insufficient to cover the year-round habitat requirements of Argali; for instance, the sub-species *Ovis a. darwini* moves from Inner Mongolia (China) and the Gobi (Mongolia), and populations in the Altai mountains migrate to Russia<sup>82</sup>.

Hunting of the species in protected areas is prohibited by law, yet poaching and overgrazing have previously been reported to occur within many of them<sup>83</sup>. Lack of resources to manage protected areas across the species range has been reported as one of the challenges to successful Argali conservation<sup>84</sup>. Several conservation and research projects are underway across Mongolia, including an interdisciplinary research and conservation project in Ikh Nart Nature Reserve, Dornogobi Aimag, through the Mongolia's Argali Wildlife Research Center, the Denver Zoological Foundation (DZF), and the Mongolian Academy of Sciences (MAS)<sup>85</sup>. Transboundary activities on the conservation of the Altai-Sayan region and establishment of a Mega Connectivity Conservation Corridor (an initiative between China, Russia, Kazakhstan and Mongolia) have been ongoing<sup>86</sup>.

\* United Nations Environment Programme –  
World Conservation Monitoring Centre (UNEP-WCMC)

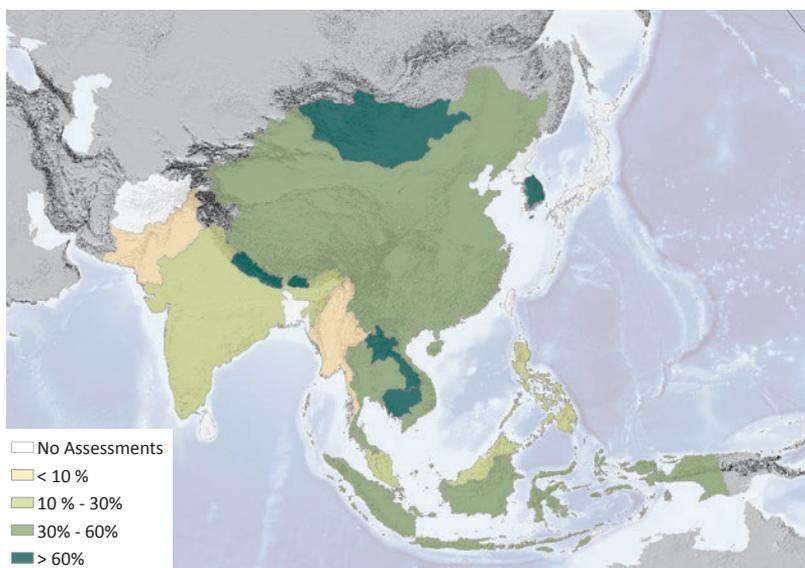
In 2014, one of the first management performance tools to explore aspects of management, financing, and governance of regional protected area networks was developed<sup>87</sup>. The management performance of three MPA networks in the Philippines was evaluated using a combination of assessment tools, key information interviews, and community perception surveys. The overall performance scores for the selected MPA networks ranged from “fair” to “good” and it was concluded that MPA networks did further the development and effectiveness of management in the Philippines<sup>88</sup>.

### 5.3. EFFECTIVE MANAGEMENT OF PROTECTED AREAS IN ASIA

In 2004, the Convention on Biological Diversity (CBD) established its Programme of Work on Protected Areas (PoWPA) in recognition of the importance of protected areas to achieving the convention’s goals. Goal 4.2 of the CBD PoWPA sets a preliminary global target of assessing the management effectiveness of 30% of the world’s protected areas by 2010<sup>89</sup>. This target was updated in the CBD’s Conference of Parties (COP) 10 when the CBD Aichi targets expanded the mandate for management assessments and invited parties to “continue to expand and institutionalize management effectiveness assessments to work towards assessing 60% of the total area of protected areas by 2015 using various national and regional tools and report the results into the global database on management effectiveness maintained by the World Conservation Monitoring Centre of the United Nations Environment Programme (UNEP-WCMC)”<sup>90</sup>.

The IUCN World Commission on Protected Areas (WCPA) has developed a framework guide to assessing management effectiveness that has been widely used globally<sup>91</sup>. Over 40 different protected area management effectiveness (PAME) data collection tools have been developed in the recent years. These methodologies are diverse in scope and level of detail. Most assess resources allocated to inputs and processes for protected area management but many also evaluate progress towards protected areas meeting specific biodiversity and social outcomes. In 2005, a global study to evaluate management effectiveness was launched which was completed in 2010<sup>92</sup>. The study attempted to obtain a global picture of protected area effectiveness and to track CBD targets and reporting needs. Existing PAME assessments were collated into a single database as part of this study. This consolidated database has since been updated thanks to a collaborative research project between the University of Queensland, the University of Oxford, IUCN WCPA and UNEP-WCMC with inputs from a wide range of other partners. The database is being actively managed and contains PAME assessments from 1991 to 2014. The management effectiveness dataset currently holds around 8,000 sites<sup>93</sup> worldwide. The management effectiveness framework has also been used to inform the World Heritage Outlook, a new initiative that assesses the performance of natural and mixed World Heritage sites (see Box 3.3), and integrated as part of a new initiative led by the IUCN World Commission on Protected Areas: The Green List of Protected areas (see Box 5.2).

In 2013, progress towards meeting the global targets for PAME was assessed. 29% of the areas protected had been assessed and 40 countries had reached the target of assessing the management effectiveness of 30% of the total area of protected areas<sup>94</sup>. Figure 5.2 shows that 11 countries in the Asia Region had not meet the 30% target by 2013. However, 13 had met the 30% target and 8 (Bhutan, Brunei Darussalam, Cambodia, Lao PDR, Mongolia, Nepal, Singapore, Republic of Korea) even met the 60% target in 2013.



**Figure 5.2** National Progress towards the CBD 30% and 60% targets for PAME assessments in the Asia Region. Progress was measured by calculating the percentage of the total areas of the nationally designated sites that had been assessed. Source: Coad et al. 2013

## Box 5.2 Improving protected area management in China through the IUCN Green List of Protected Areas

**Yan Zhang\***

The IUCN Green List of Protected Areas (GLPA) is a new global initiative that celebrates the success of effective protected areas, and encourages the sharing of that success so that other protected areas can also reach high standards. The GLPA process includes setting regional or national reference groups and quality assurance processes to assess whether protected areas comply with a number of internationally agreed criteria that systematically assess successful conservation in protected areas. The criteria are based on four pillars that are considered for each protected area: Successful Conservation of Natural Values and Social Equity, Design to Protect, Equitable Governance, and Effective Management. Pilot projects to implement the GLPA are being conducted in China, Colombia, France, Italy, Spain, and Republic of Korea.



In China, IUCN and Conservation International China Programme, have been promoting the inclusion of Chinese protected areas in the GLPA process. To select protected areas that could be included in the GLPA, a multi-sectoral GLPA Chinese National Reference Group of 27 senior experts from a range of institutions was created. In September 2014, 19 protected areas in China were being considered for inclusion in the GLPA. To achieve IUCN Green List status, nomination packages for each of these protected areas were prepared. The Reference Group, through a process verified by an accredited, independent third party, has the role of reviewing the nominations and indentifying those protected areas for final consideration of the IUCN Green List Committee.

The first suite of protected areas to be included in the GLPAs will be announced at the IUCN World Parks Congress in November 2014 at Sydney, Australia. It is hoped that many others will follow.

\* IUCN China Country Programme Office

In 2013, the ASEAN Centre for Biodiversity carried out a study on the management effectiveness of ASEAN Heritage Parks (AHPs, see Box 3.1). The study was conducted through a desk review, dissemination of a questionnaire based on the Management Effectiveness Tracking Tool (METT) to all AHPs, and field visits to five AHPs<sup>95</sup>. Human resources were reported as major constraints faced by the AHPs, followed by collaboration with other institutions, law enforcement, and budget availability (See box 5.3 for an example of protected areas financing in the region). Three parks – Taman-Negara Pahang (Malaysia), Kinabalu National Park (Malaysia), and Khao Yai National Park (Thailand) were categorized as having “very good” park management. The Virachey National Park of Cambodia was categorized as “below average” while the rest of the AHPs were categorized as either “good” or “average”. Many of the AHPs did not have updated plans and still used old plans. Most AHPs needed more improvement on tourism and collaboration with local and indigenous peoples and were perceived not to be providing optimal economic benefits to the local peoples, resulting in low stakeholder support to the AHPs.

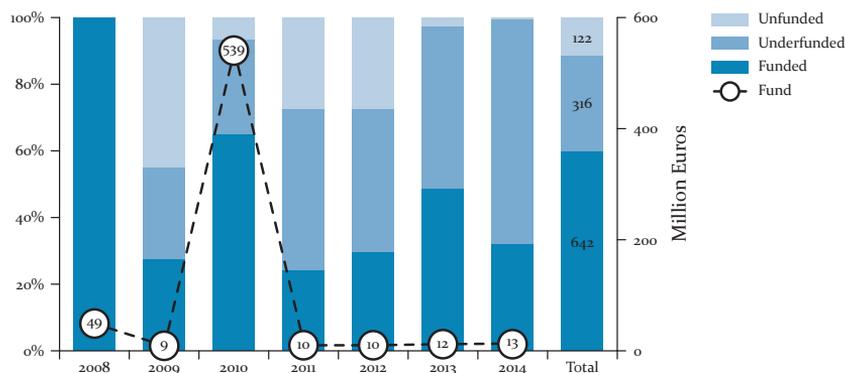
### Box 5.3 Financing of Protected areas in the Asia Region

Resource mobilisation and financial sustainability are critical elements for the establishment and effective management of protected areas. The major source of funding for protected areas is the national government and a small contribution is from the local government. Additional funding comes from international assistance from NGOs and other funding agencies. Some income also comes from entrance fees, and payment for some activities in the park. A recent study reported that only three out of the 33 designated ASEAN Heritage Parks (Kinabalu National Park and Taman Negara Pahang, both in Malaysia; and KhaoYai National Park, Thailand) were successful in managing their parks and able to self-finance most of their operational costs, including staff salaries. The high number of local and international visitors had contributed to this success<sup>96</sup>.

#### The CBD LifeWeb Initiative

The Convention on Biological Diversity (CBD) has developed the LifeWeb Initiative for CBD Parties to showcase their needs for biodiversity conservation in protected areas. The CBD LifeWeb Initiative is not a fund. It facilitates financing for area-based conservation projects supporting the Strategic Plan for Biodiversity 2011-2020. It provides support to countries to articulate their financial and technical needs and profiles those needs online and at donor roundtables. The CBD LifeWeb Initiative adds value to development cooperation partners and other donors by (i) providing a user-friendly clearing-house of financial priorities, (ii) facilitating funding matches, (iii) helping leverage counterpart funding and (iv) recognizing support provided. For more information see: <http://lifeweb.cbd.int/>

In 2014, the CBD LifeWeb had facilitated 18 conservation projects out of 25 projects from 17 countries in Asia, making a total of 93 million Euros with 56% of matching funds. 72% of the projects had been fully or partially funded since 2008. However, there was still a funding gap for unfunded and partially funded projects of 63 million Euros.



*LifeWeb facilitated funds (million Euros) in the Asia Region between 2008-2014. Source: CBD Secretariat 2014*

## 5.4. CONCLUSIONS AND FUTURE DIRECTIONS

- Management of areas for conservation of natural resources has a long history in the Asia Region. Records of forest conservation in the Korean Peninsula, India, China and Japan go back to over 2,500 years.
- Today, around 86% of protected areas in the Asia Region have been assigned an IUCN Management Category. A large proportion of these (77%) are classified as IUCN categories IV, V or VI. Still, no IUCN Management Category has been assigned to 12.2% of terrestrial and 26% of marine protected areas.
- More progress is needed to assess management effectiveness of “60% of the total area of protected areas by 2015”: 16 countries of the 24 included in this study had not met this target by 2013. 13 countries had conducted management effectiveness assessments for 30% of the total area of protected areas and eight (Bhutan, Brunei Darussalam, Cambodia, Lao PDR, Mongolia, Nepal, Singapore, Republic of Korea) for 60%.
- Although some international initiatives are starting to address the financial gap to manage protected areas effectively, there is a need for greater investment and stronger political commitment by governments to provide protected areas with the resources they need.
- Objectives of managing protected areas, besides the primary one of biodiversity conservation, now also include social and economic ones. Reconciling protected areas objectives with the needs of local livelihoods will require building new partnerships and alliances with local businesses and communities. It is important that in this changing context, the diverse range of institutional and administrative arrangements fit into the countries’ national protected area systems.





## 6. Protected Area Governance

Governance of protected areas refers to the “interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken and how citizens or other stakeholders have their say”<sup>97</sup>. This decision-making structure is distinct from the management of protected areas, which relates to how the decisions made by the governing authorities are put into practice.

Since the establishment of the first protected areas, there have been governance structures in place to oversee them. What is relatively new is the acknowledgement that protected areas can have a diverse range of governance mechanisms and that the quality of these mechanisms has implications for the effectiveness of protected areas management. These ideas first received widespread attention just over a decade ago, when they were the subject of a stream of events at the 2003 World Parks Congress in Durban<sup>98</sup>. One of the four elements of the Convention on Biological Diversity’s (CBD) Programme of Work on Protected Areas (PoWPA) is also focused on governance, participation, equity and benefit sharing. The goals of this programme element are supported by thirteen activities that promote equity, benefit-sharing and the engagement of relevant stakeholders, indigenous peoples and local communities. Despite the fact that all parties to the CBD have adopted PoWPA, governance remains one of the least developed elements in the context of implementation<sup>99</sup>.

This chapter provides an overview of different governance types of protected areas in the Asia Region.



## 6.1. PROTECTED GOVERNANCE IN ASIA

In the Asian Region, protected areas exist in a complex mosaic<sup>101</sup>. For example, in India 91 ‘eco-cultural’ zones have been identified where distinctly different culturally based land use systems can be seen<sup>102</sup>. 4,635 different ethnic communities, speaking 325 languages/dialects reside in these areas<sup>103</sup>. It is also a region rich in culture and tradition, where there is a significant population dependent on natural resources to meet their livelihood needs. As a consequence, governance of the land and the relationship of local communities with biodiversity has evolved in many different and unique ways (e.g. Satoyama Satoumi in Japan, Box 6.1).

In this context, governance of protected areas by central and/or state governments for conservation does not always address these needs and may deprive local communities of natural resource-based livelihoods<sup>104</sup>. Until recently, conservation policies and programmes have not considered people’s dependence on natural resources, their traditional knowledge and practices, and rights and responsibilities to manage biodiversity. Communities have felt alienated from protected areas and this has often resulted in conflict and hostility<sup>105</sup>. In acknowledgement, there is now a move in several Asian countries towards revising protected area systems to make them more flexible and amenable to different governance systems. A notable example is Lao PDR, where there has been a process to revise the national protected area system to accommodate more diverse governance regimes<sup>106</sup>. However, often there is not only one governance type in a given area. Figure 6.1 shows the gradation of governance regimes. Governance types are site specific and very often one type that works in a certain country and situation may not work that well at another site.

### Box 6.1 Satoyama and Satoumi in Japan

Seema Bhatt\*

Japan has two traditional landscape-based management systems in land (**Satoyama**) and coastal (**Satoumi**) areas. These approaches both allow for management that incorporates sustainable use. **Satoyama** dates back to the seventeenth century and involves managing landscapes formed from a mosaic of ecosystems, such as secondary forests, agricultural lands, irrigation ponds, grasslands and human settlements. The concept of **Satoumi** came into use in the twentieth century and refers to human interactions with coastal ecosystems<sup>107</sup>.

Examples of these approaches include the **Satoyama** and **Satoumi** in the Noto peninsula, which are located on the Japan Sea and include the municipalities of Suzu City, Wajima City, Nanao City, Hakui City, Noto Town, Anamizu Town, Shika Town, and Nakanoto Town. The Noto Peninsula has a rich cultural history dating back over 2100 years. Traditional practices are closely linked to the mosaic of land-uses across the landscape, including agriculture, forests and marine areas. The peninsular landscape is characterised by hilly terrain interspersed with valleys and agricultural fields, surrounded by a coastline made up of volcanic rock.

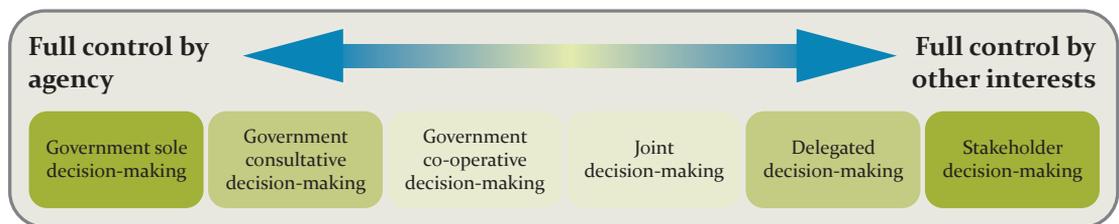


The **Satoyama** and **Satoumi** are governed through a combination of traditional and contemporary laws and regulations. This includes feudal hereditary resource use rights and modern laws. Cultural norms and systems based on indigenous Shinto and Buddhist traditions also play a role, including through planting and harvesting festivals. The local communities in the Noto peninsula continue to follow their traditional systems to maintain their livelihoods and conserve biodiversity<sup>2</sup>.

\*Independent consultant

Some countries in the Asia Region are starting to consider the complexity of protected areas governance in the region. A study conducted by the Directorate General Forest Protection and Nature Conservation, Ministry of Forestry assessed governance in seven National Parks from different islands across Indonesia (Gunung Leuser and Kerinci Seblat in Sumatera, Halimun Salak in Java, Komodo in East Nusa Tenggara, Kayan Mentarang in Kalimantan, Lore Lindu in Sulawesi, and Wasur in Papua), using the IUCN Governance Guidelines. It examined in detail issues of legal status and legitimacy, vice, direction, performance, accountability, benefit sharing, rights and responsibilities through direct interviews of almost 2,000 people including local communities, local government and parks staff. The preliminary results reveal a better than expected rating in the areas of legality and legitimacy which provides a strong foundation for improving other aspects of governance, and that benefit sharing is getting better. Improvement is still required particularly in the areas of direction, accountability, and performance. The study also recommends some slight adjustments to the IUCN Guidelines to increase their suitability for wider application in Indonesia<sup>108</sup>.

Four main governance types are recognized by both IUCN and the CBD. These governance types (Table 6.1) are grouped according to the key authorities that are responsible for management decisions relating to the area<sup>109</sup>. Each of these four governance types may apply to protected areas, as defined by IUCN<sup>110</sup>, and to “other effective area based conservation measures”, which may not fit the IUCN definition of a protected area, but that nevertheless may achieve conservation goals under the governance of a range of actors. These two forms of conservation form the basis of Aichi Biodiversity Target 11, and both are reflected in the examples used in this chapter.



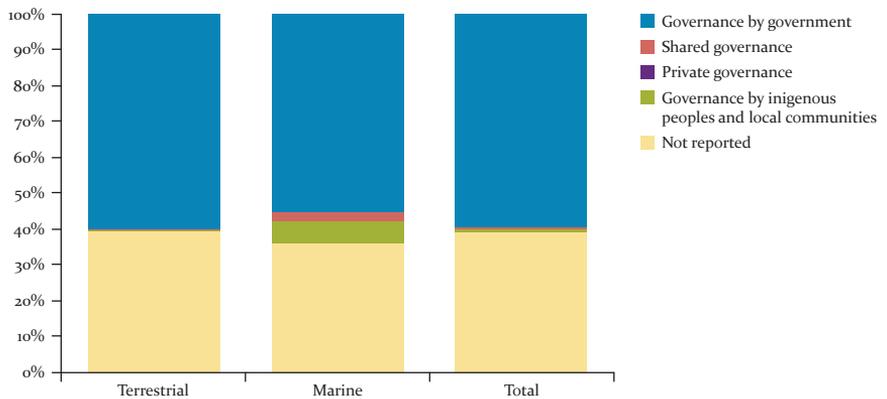
**Figure 6.1** The range of options for governing protected areas from full control by government agencies to full control by other stakeholders. Source: adapted from Dearden et al. 2005.

**Table 6.1** IUCN Governance Types for Protected Areas (adapted from Borrini-Feyerabend et al. 2013)

Governance Type	Sub-types
Type A. Governance by government	Federal or national ministry or agency in charge
	Sub-national ministry or agency in charge
	Government-delegated management (e.g. to an NGO)
Type B. Shared governance	Transboundary governance (between one or more sovereign States or territories)
	Collaborative governance (various forms of pluralist influence)
	Joint governance (pluralist management board)
Type C. Private governance	Protected areas established and run by individual landowners
	Protected areas established and run by non-profit organizations (e.g. NGOs, universities)
	Protected areas established and run by for-profit organizations (e.g. corporate owners, cooperatives)
Type D. Governance by indigenous peoples and local communities	Indigenous peoples' conserved territories and areas – established and run by indigenous peoples
	Community conserved areas and territories – established and run by local communities

The World Database on Protected Areas (WDPA) records IUCN governance types as reported by data providers. In 2014, 60% of protected areas in the WDPA had a governance type assigned (Figure 6.2). More than half (58.5%) of protected areas in the Asia Region are managed by governmental sub-national or national agencies. The proportion of protected areas managed by indigenous peoples and local communities is surprisingly low (0.9%) although this might be because to date the WDPA only recorded protected areas that meet the IUCN definition of protected areas (see Box 1.2), and primarily those are reported by state agencies. Other governance types include shared governance (0.5%) and private governance (0.05%) which is clearly underrepresented in the WDPA. This might be reflecting the reality in the Asia Region or may be due to a lack of reporting by countries to the WDPA of other alternative governance types for protected areas in the region.

**Figure 6.2**  
Proportion (%) of governance types in Asia reported to the World Database on Protected Areas.  
Source: UNEP-WCMC 2014b.



### Type A: Governance by government

This type of governance involves primarily a government agency such as a Ministry or a Protected Area Agency that directly reports to the central body. This agency has responsibility for designating protected areas in addition to determining their conservation objectives, formulating management plans and implementing them. Governance of protected areas by governmental agencies becomes complicated when the designated land or waters are legally owned or managed by local communities, private individuals or companies. Recognising the need for positive relationships with local people in and around the protected areas, the Korea National Park Service has organised local cooperation committees. These consist of local residents, local government, NGOs, and external expertise for consulting on management issues, keeping stakeholders informed, enhancing the opportunity to participate in the park management and reflecting adopted issues in its policy. In 2010, it had 985 members<sup>111</sup>.

### Type B: Shared Governance

This is when the authority and responsibility for protected area governance is shared among a range of different actors. Where people live in or around protected areas, a shared model of governance is sometimes more successful than ‘governance by government’. For areas that are owned and/or managed by local communities government support to combat threats or for financial and technical help is often welcome. These arrangements thus need to be mutually beneficial and are usually flexible<sup>112</sup>.

An example of this type of governance is the Bunaken National Marine Park located at the northern end of Sulawesi Island, close to the centre of Indonesia. This protected area was established in 1991. Approximately 30,000 people live in 22 villages located within the national park. The park holds some of the best coral reef diving in the world, making it a popular tourist destination. As a result, the traditional livelihoods of fishing and farming are now supplemented by significant revenue from tourism. Governance of the Bunaken National Marine Park is collaborative, involving the national government and an advisory board of key stakeholders that include 19 members representing the national, provincial and city governments, local communities, private-sector tourism operators, and academia<sup>113</sup>.

## Box 6.2 Apo Island, Philippines

The small island of Apo is in the central (Visayan) part of the Philippines, near the Negros Island. This 0.74km<sup>2</sup> volcanic island surrounded by coral reefs is home to 750 people. This area was afforded protection in 1976 with support from the nearby Silliman University when it was discovered that local fish stocks had collapsed. In 1979, the Apo Island Marine Reserve was initiated by a group consisting of local community members, Silliman University marine biologists, and social scientists. Marine conservation and education programmes were also introduced here at this time by Silliman University extension workers. A 0.45 square kilometres area along the coast was delineated by the local community as a 'no take' reserve in 1982. In 1985 this was declared a Municipal Marine Reserve by the municipal council of the town of Dauin, Negros and Silliman University with support from the Marine Conservation and Development Program (MCDP). In 1994, almost ten years later, the area was declared a Protected Landscape and Seascape under the National Integrated Protected Area System (NIPAS). The national government then assumed the governance role and established a Protected Areas Management Board (PAMB). Conservation and management have resulted in improved habitat and increased fish stocks and the area has become a popular tourist destination especially for diving. The money generated from tourism is used for community development projects as well as reef protection.

Apo is now managed by the PAMB. The Board includes the DENR Regional Executive Director (currently represented by the Provincial Environmental Officer), the Provincial Planning and Development Officer, the mayor of the municipality of Dauin, Apo's Barangay Captain (the elected village leader), representatives from various NGOs, two representatives of Silliman University, and two representatives of Apo people's organizations. Shared governance of the Apo Island Marine Protected Area was initially established between the community and the local government. In 1994 the arrangement changed to one between the national government and the community. There were mixed responses to this. The mayor of the local community stated that, "co-management should be between the local government unit and the community and not with the national government. The national government is very bureaucratic." A positive outcome due to the close relationship of the island authorities and the Silliman University, the island has been well studied and has given the local residents a lot of exposure to other people and organizations<sup>114</sup>.

Another example is the Shiretoko National Park in Japan, established in 1964 and declared a World Heritage Site in 2005. Fisheries were managed in this area by the local fishing community even before the declaration of the National Park. The seasonal no-take zones for Walleye Pollock spawning stocks, for example, have been determined by local gillnet fishers since 1995<sup>115</sup>. These zones are reviewed every year on the basis of the previous year's performance data as well as scientific concurrence from the local research station. This activity has been incorporated into the marine management plan of this protected area<sup>116</sup>.

### *Type C: Private Governance*

This type of governance is for areas that are owned by individuals, Non-Governmental Organisations (NGOs) or corporate bodies. Individuals may set aside areas for their aesthetic or ecological value. NGOs may also own, lease or manage land specifically for conservation objectives. Corporate bodies may do the same to display their corporate social responsibility. Areas could also be conserved and managed for their value and subsequent financial benefit such as for the purpose of ecotourism<sup>117</sup>. Few examples of this type of governance are found from this region, although this could be because these areas have been the least documented<sup>118</sup>.

An example of NGO-level private governance is the Tsurui-Ito Tancho Sanctuary in Japan, which was established by Wild Bird Society of Japan in 1987. The reserve's primary objective is conserving red-crowned cranes and their habitat. Prior to the reserve's establishment, members of several nature conservation groups and other ornithologists had set up the Special Committee for Protection of Red-crowned Crane. This committee developed a plan to establish a bird sanctuary in the village of Tsuruimura, which was subsequently enacted. The sanctuary is financially supported through the membership fees from the Wild Bird Society of Japan and donations from other interested individuals ([www.wbsj.org/en/tsurui/](http://www.wbsj.org/en/tsurui/)).

## Type D: Governance by Indigenous Peoples and Local Communities

In the past ten years, the significant contribution of governance by indigenous and local communities to biodiversity conservation has been acknowledged, bringing widespread recognition to what is perhaps the oldest form of conservation<sup>119</sup>. The term indigenous peoples' and community conserved territories and areas (ICCAs) has been used to describe "natural and/or modified ecosystems, containing significant biodiversity values, ecological benefits and cultural values, voluntarily conserved by indigenous peoples and local communities, both sedentary and mobile, through customary laws or other effective means"<sup>120</sup>.

Hundreds of examples have now been documented and reveal a diversity of initiatives that include protection of sacred sites, catchment forests, sustainable fishery sites, nesting/feeding grounds for birds/turtles, and also community efforts to protect ecosystems against development<sup>121</sup>. Many of these initiatives will fall within the IUCN definition of a protected area, but others will not, and can instead be categorized as other effective area-based conservation measures. In particular, sites will fall into this category where there are primary objectives other than conservation, for example cultural preservation, but they still may deliver positive outcomes for conservation. The religious and cultural significance of a site is often an important motivation for community conservation in Asia. In the desert region in the state of Rajasthan, India we can find *Orans*. These are sacred woodlands generally found around temples, which also function as protected grazing ranges. *Orans* perform an important ecosystem service by replenishing aquifers in the desert. The dominant tree, *khejari* (*Prosopis cineraria*), is also worshipped for its high ecological value<sup>122</sup>.

In Nepal, the Khumbu region is considered sacred by the indigenous Sherpa community. It has a recorded history of 500 years and contains many ICCAs<sup>123</sup>. In Sri Lanka there is a practice of setting aside forest areas for Buddhist monks to meditate. These forest hermitages, or *aranyas*, are usually established within state forests and leased out to monks. The governance of these *aranyas* is carried out by a committee made up of prominent citizens. Protection happens in these areas by *default*, making them other effective area-based conservation measures. The Forest Department has carried out studies to monitor the biodiversity in these areas<sup>124</sup>.

Communities also continue to protect areas for aesthetic reasons. In Bangladesh, in the Pochamaria village, several Hindu and Muslim families protect a bamboo grove near the village where herons breed. This heronry is possibly the largest in the country outside of government reserved forests. Despite the noise created by the birds, the people of Pochamaria value the birds and are proud of their natural heritage<sup>126</sup>. There are similar sites in India and Sri Lanka, where communities conserve the nesting and wintering sites of herons and waterfowl, as well as sites important for other wildlife populations such as sea turtles<sup>127</sup>.

In China, there are ICCAs that include community forests and rangelands managed through customary governance. They range in size from individual gardens to entire regions<sup>128</sup>. The South-east Asia Region also abounds in sacred areas that are often instrumental in conserving biodiversity despite commercial pressures including mining and timber concessions<sup>129</sup>.

However, these areas are also facing threats and challenges. A study of ICCAs in South Asia<sup>130</sup> highlighted some of these. Communities themselves are not homogenous entities. Social inequities and hierarchies within societies often give rise to conflict and prove to be a threat to these areas. Community values and aspirations are also changing in the globalised world and communities may not be amenable to continue with traditional ways of life. Development projects and market forces threaten these areas, as they do with other protected areas as well. More in-depth studies are needed to document as well as analyze the contribution of these areas to biodiversity conservation.

### Box 6.3 A future for local communities in protected areas: Ibis Rice™ in Cambodia

Increasing pressure on land resources in Cambodia has resulted in exacerbated forest clearances and subsequent destruction of biodiversity. These areas, besides being critical wildlife habitats for several endangered bird species including Cambodia's national bird, the Giant Ibis (*Thaumatibis gigantean*), are also home to several poor and marginalised communities dependent on the biodiversity to meet their livelihood needs. The Wildlife Conservation Society (WCS) that has been working here realised that any successful conservation initiative will need to address both livelihood needs as well as social development issues of local communities. The villages pre-date the protected areas, so moving the people from those areas was not an option. Communities would require economic incentives if habitat degradation was to be curbed.

In 2008 WCS introduced the concept of Ibis Rice™. As part of this initiative, wildlife-friendly village agricultural cooperatives were developed in four communities in the PreahVihear province to help both improved livelihoods and conservation practices. These cooperatives known as Village Marketing Networks (VMN) buy rice from farmers who agree to follow conservation guidelines, adhere to land-use boundaries and practice chemical-free agricultural practices. The project is focused on the poorest farmers who are more dependent on forest resources. By offering a better price these farmers improve their financial and social standing. Once a level of sustainability is reached, Ibis Rice™ hopes to pay dividends to participating farmers.

In 2009, once the Ibis Rice™ project was well established, WCS established *Sansom Mlup Prey* (SMP), a not-for-profit Cambodian non-governmental organization. SMP was established to work with communities residing in protected areas in order to develop wildlife-friendly products and facilitate connecting community-agricultural networks to biodiversity conservation. SMP has offices in Siem Reap and Phnom Penh and assists VMN to help procure paddy and transport it to a mill in Phnom Penh. It also helps in developing a range of Ibis Rice™ products and marketing them. Eight different products of Ibis Rice™ are available in the market today. Based on the marketing of Ibis Rice™ in some of Cambodia's popular tourist destinations, a business plan was completed in 2010. Ibis Rice™ is being promoted as i) Wildlife Friendly™ certified ii) grown without chemicals iii) facilitating the protection of critically endangered bird species and iv) providing an economic incentive to farmers who support conservation. Certification is done through the Wildlife Friendly Enterprise Network, "a global community dedicated to the development and marketing of products that conserve threatened wildlife while contributing to the economic vitality of rural communities". Sales from 2013 have been recorded at US \$121,433.



Today, this scheme extends to 11 villages. This includes two villages in the floodplains of the Tonle Sap, where Bengal Florican Conservation Areas are situated. By the end of January 2014 more than 435 tons of rice was sold under this scheme and 299 farmers have benefitted from this. Other than enhancing farmer incomes, the project provides other benefits to the community such as training in agricultural techniques and awareness on issues of climate change and gender. Wildlife Friendly certification ensures that farmers who are part of this scheme adhere to the long term conservation of the area. Farmers that endorse

conservation agreements through this project become eligible for formal land titles for their plots. These tenurial agreements lend further support to the conservation of these habitats. The Ibis Rice™ scheme changes the way people think about the forest. The scheme is based on land-use plans which are agreed with communities prior to them entering into the scheme. These plans set out where they can farm, where they can clear habitat for expanding the farming area and which areas they have to protect. They also agree not to hunt threatened species. The land-use plans for the basis of land-tenure agreements.

## 6.2. CONCLUSIONS AND FUTURE DIRECTIONS

- Asia's cultural diversity and heritage has had and continues to have a tremendous bearing on conservation in the region with some governance and management systems being unique to the area. Notable examples include the Satoyama and Satoumi in Japan, Aranyas forests in Nepal, Orans in India and innovative initiatives such as the Ibis Rice in Cambodia.
- Managing protected areas, particularly in the context of Asia requires an understanding of the wider socio-ecological landscape that includes a range of stakeholders and different approaches.
- Protected area systems in Asia have primarily been established by respective country governments. All four main governance types are represented in the WDPA although sub-national and national governance seems to be predominant in protected areas.
- In recent years there has been a move towards greater shared governance in the Asia Region, and towards recognition of non-government governance types. However, there is a need to recognize all existing governance types for the contribution they make to conservation of biodiversity and ecosystem services.
- IUCN's principles of good governance (equitable governance) for protected areas need greater promotion in the Asia Region. These include legitimacy and voice; direction; performance; accountability; and fairness and rights. Each governance regime is unique and should be viewed in its specific context. For example, the heterogeneity that exists in many Asian communities must be kept in mind and the needs of the socially vulnerable addressed when considering governance of protected areas in the region.
- There is also the need to recognize the limitations associated with capacity of communities to govern and the need to focus on effective ways of measuring conservation outcomes in all forms of governance.
- Data collection on other types of governance of protected areas in Asia needs to be expanded to obtain a more accurate picture of the actual governance regimes in place, and the role that these can play in the conservation of biodiversity.

## 7. Connectivity

“Parks Connect” was the unifying theme of the first Asia Parks Congress (APC) convened in Sendai, Japan in 2013. This event, which brought together the protected area community from across Asia, consolidated the belief that improved regional collaboration is vital to the goal of establishing effective protected area systems and highlighted the importance of working across national borders to tackle protected area issues (APC, 2014, see Section 1.1).

The Asia Region already possesses an impressive portfolio of internationally and regionally significant conservation projects which promote connectivity of protected areas, including Coral Triangle Initiative (CTI), Heart of Borneo Initiative (HoB), Greater Mekong Sub-region Core Environment Program (GMS CFP-BCI), The East Asian-Australasian Flyway Partnership (EAAFP), and the Terai Arc programme (APC, 2014). Investigating the feasibility of expanding these existing protected area networks into a pan-Asian protected area system is currently identified as a high priority within the World Commission on Protected Areas (WCPA) Asia strategy for 2011-2014<sup>131</sup>. However, fewer broad scale studies on the subject of protected area networks have been conducted in Asia compared to other regions of the world<sup>132</sup>.



## 7.1. DEVELOPING AND MANAGING PROTECTED AREA NETWORKS FOR CONNECTIVITY

Initiating, planning and implementing large-scale conservation initiatives is a complex and long term venture<sup>33</sup>. In order to achieve a functioning network, careful land use planning and management are required. In the Coral Triangle, numerous studies have been undertaken to gain further insight into how best to develop and manage protected areas, and some examples are presented below.

### *Examples from the Coral Triangle*

The Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security (CTI-CFF) is a programme of work adopted by six countries within the Coral Triangle (Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands, and Timor-Leste) aimed at protecting the value of the region through the promotion of more sustainable marine resource use. Key to the success of this initiative is the development of a region-wide, comprehensive, ecologically representative and well-managed system of marine protected areas (MPAs)<sup>34</sup>.

**Development:** Within the last 50 years, the number of protected sites within Asia has expanded rapidly<sup>35</sup> (see Chapter 3). Despite this growth in the number of individual protected areas few were planned to form ecological networks from the outset. A number of different approaches have been taken to develop networks of protected areas. Three such approaches taken to develop marine protected area (MPA) networks in the Coral Triangle<sup>36</sup> are:

- *From the bottom up.* Protected area networks developed through the strategic co-ordination of existing separate MPAs.
- *Multiple use zonation.* Protected area networks developed through the division and refinement of existing large MPAs.
- *From the outset.* Protected area networks designed from the outset.

**Management:** At a regional-scale, governance of protected area networks for connectivity poses a number of challenges. A review of the contextual challenges associated with regional governance in the Coral Triangle<sup>37</sup>, highlighted the need to recognize the heterogeneous, multi-scale and interlinked nature of large scale marine systems. It championed a critical and reflective approach to governance within the Coral Triangle, in which governance arrangements are regularly assessed and adjusted to account for the dynamic nature of regional commons<sup>38</sup>.

## 7.2. SOCIO-ECONOMIC BENEFITS OF PROTECTED AREA NETWORKS

One of the defining features of ecological networks is the integration of biodiversity conservation and sustainable use. The long-term conditions created as a result of the combination of these two elements has been linked to a number of socio-economic benefits<sup>39</sup>. Examples of some of the socio-economic benefits gained from current regional initiatives within Asia are presented below.

### *The Greater Mekong Subregion*

The Greater Mekong Subregion (GMS) is one of the richest biodiversity hotspots in the world<sup>40</sup>. Recognising the need to conserve this biodiversity and address the issue of ecosystem fragmentation, the GMS leaders launched The Biodiversity Conservation Corridors Initiative (BCI). Between 2006 and 2011, eight BCI pilot sites across the GMS were established. Across these pilot sites a total area of 1,294,936 ha has been delineated as BCI corridors and 3,722 ha of land has been reforested resulting in the avoidance of over 100 million tonnes of carbon dioxide emissions<sup>41</sup>. In addition, the BCI has established over 180 locally managed institutional mechanisms including village development funds and conservation stewardship programs in order to encourage local participation in biodiversity conservation. On top of this the BCI has injected direct cash incentives worth more than US\$796,273, benefiting more than 28,367 households<sup>42</sup>.

## The Terai Arc

The Terai Zone is a belt of land, approximately 35km wide, which stretches across the foothills of the Himalayas from southern Nepal into India, Bhutan and Bangladesh. The Terai Arc programme is a joint initiative set up with the ambition of securing the twin goals of sustainable development and biodiversity conservation. To date, the Terai Arc Landscape has focused on five priority areas in Nepal and additional linkages with protected areas across the border with India are in the pipeline. Since 2002, 22,000 ha of forest have been set aside for community forestry projects, comprising participants from over 29,000 households. In addition to this the programme has provided subsidies to local communities to develop alternative fuel sources to wood and has also established a number of Ecoclubs for the purpose of delivering educational courses and awareness raising programmes<sup>43</sup>. Another interesting initiative with benefits to nature and people in the same region is the Proposed Kangchenjunga Landscape in the Hindu Kush Himalaya (Box 7.1).

### Box 7.1 The Proposed Kangchenjunga Landscape in the Hindu Kush Himalaya

The proposed Kangchenjunga Landscape (KL) is considered one of the most important transboundary landscapes in the Eastern Himalaya. In total, this landscape incorporates 15 designated protected areas and six proposed corridors covering an area of 14,432km<sup>2</sup> which spans across eastern Nepal, India, Bhutan and the Tibetan Autonomous Region of People's Republic of China. Habitats within this landscape range from Himalayan Alpine Meadows to the Eastern Himalayan Broadleaf and Conifer Forests, to the Terai-Duar Savannas and Grasslands. These habitats are home to a rich diversity of flora and fauna, including snow leopard, tiger, elephant, red panda, musk deer, and many threatened plant species.

In addition to biodiversity conservation, a key focus of this landscape initiative is the provision of support to local communities to encourage the sustainable management of the natural resources on which they depend and provide alternate livelihood opportunities. Furthermore, this initiative aims to help preserve the cultural and spiritual values associated with this landscape. This initiative is being promoted by the International Centre for Integrated Mountain Development (ICIMOD), a regional knowledge and enabling centre based in Kathmandu, Nepal. ICIMOD has been promoting regional cooperation for effective conservation and development of critical transboundary landscapes in the Hindu Kush Himalayas for the last 29 years.

## 7.3. EVALUATING PROTECTED AREA NETWORKS

Evaluation of the effectiveness and appropriateness of protected area networks is recognised internationally as a vital component of responsive, pro-active protected area management. However, the size and complexity of protected area networks makes performing such evaluations complicated.

### *Heart of Borneo Indicators*

In 2007, the governments of Brunei Darussalam, Indonesia and Malaysia signed the Heart of Borneo (HoB) Declaration committing to the preservation and sustainable development of the 22 million ha of continuous forest within the HoB<sup>44</sup>. Almost 3 million ha (12.6%) of the HoB is inside protected areas<sup>45</sup>. However, a study conducted by Proctor, McClean and Hill (2011), which used remotely-sensed land cover data and reserve design software to rank sites according to forest extent and connectivity, found that only 20% of sites recognized as highly connective were part of the protected area network. It is predicted however, that through the expansion of the existing protected area network the HoB project could potentially increase the extent of high-connectivity forest within protected areas to 54–67%<sup>46</sup>.

The ecological health of ecosystems and the sustainability of supporting institutions provide an important measure of the success of conservation initiatives. A comprehensive set of indicators representative of the ecological status of the HoB were identified. Based on these indicators, the HoB was assessed as having a 'good' biological status<sup>47</sup>. There are, however, still a number of causes for concern as highlighted in the recent report on the environmental status of the Heart of Borneo. These concerns include the insufficient representation of natural ecosystems within the HoB network and the rate of forest conversion. Projection for 2020 using the current deforestation rates indeed indicate that conservation goals for this region will not be achieved unless serious conservation interventions are applied<sup>48</sup>.

## 7.4. CONCLUSIONS AND FUTURE DIRECTION

- Despite significant growth in protected areas over the last few decades, relatively few areas were planned as part of ecological networks from the outset. The maintenance of landscape scale connectivity will become an increasing challenge as development pressure continue to rise.
- To help address this challenge, the Asia Region possesses an impressive portfolio of internationally and regionally significant large-scale conservation projects that consider connectivity for protected areas. Notable examples include ASEAN's Heritage Parks network, Coral Triangle Initiative (CTI), East Asian-Australasian Flyway Partnership (EAAFP), Heart of Borneo Initiative (HoB), Greater Mekong Sub-region Core Environment Program (GMS CFP-BCI) and the Terai Arc programme.
- Large conservation projects should promote integration of biodiversity conservation and sustainable use to deliver a number of long-term socio-economic benefits to communities involved. Examples in Asia include the creation of locally managed institutional mechanisms including village development funds and conservation stewardship programs, community forestry projects that benefit people living around them, subsidies to local communities to develop alternative fuel sources, and educational courses and awareness raising programmes.
- Evaluation of the effectiveness and appropriateness of protected area networks is a vital component of responsive, pro-active protected area management for connectivity. Projects should develop indicators to assess the ecological health of ecosystems and the sustainability of supporting institutions which provide an important measure of the success of conservation initiatives at large scales.
- Investigating the feasibility of expanding and combining these existing protected area networks into a pan-Asian protected area system is currently identified as a high priority within the World Commission on Protected Areas (WCPA) Asia strategy for 2011–2014. However, fewer broad scale studies on the subject of protected area networks have been conducted in Asia compared to other regions of the world.

## 8. Protected Areas and Disaster Risk Reduction

Healthy, well-functioning ecosystems reduce people's vulnerability to climate change and natural hazards, by reducing the risks they pose. They also increase people's resilience to climate change and disaster events by providing essential services such as flood regulation, coastal protection and slope stabilization. As part of a broader landscape, protected areas contribute to the long-term resilience of ecosystems and their dependent communities<sup>149</sup>.

This chapter describes the important role that protected areas play as nature-based solutions for Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR). It introduces CCA and explains how protected areas facilitate adaptation efforts. It describes the role of ecosystem services in DRR and how protected areas, as a key ecosystem management approach, contribute to DRR efforts. The chapter concludes with some key recommendations to achieve integrated approaches for protected area management, climate change adaptation and disaster risk reduction.



## 8.1. PROTECTED AREAS AND CLIMATE CHANGE ADAPTATION

In 2007, the International Panel on Climate Change (IPCC) called for the use of protected areas as an important mitigation and adaptation strategy. It highlighted that mitigation through forest protection would be low cost and could enhance adaptation efforts too<sup>59</sup>. The Convention on Biological Diversity (CBD) also has recognized the role of protected areas in mitigating and adapting to climate change<sup>59</sup>.

Protected areas are primarily a way of achieving sustainable ecosystem management. By reducing deforestation and emissions from land conversion, they can provide cost effective strategies to address climate change. They provide social and economic benefits as well as essential services to deal with issues related to climate adaptation and mitigation. Dudley *et al.* (2010b) showed that effectively, managed protected areas can:

- **Contribute towards climate change mitigation** by securing carbon stored in soil and vegetation, by avoiding conversion to other land uses, especially in areas of “high carbon” storage such as forests and peatlands. Coastal and marine protected areas also store carbon in seagrasses, kelp beds and mangroves. Reforestation and soil conservation in protected areas can increase the amount of carbon sequestered.
- **Provide essential natural services, which help increase communities’ resilience** and reduce their vulnerabilities.
- **Help reduce the chance of climate-related natural hazards from developing into disasters and to reduce the impacts of those natural disasters that do occur** such as floods, landslides, storm surges, fires, drought and desertification.

### Box 8.1 Protected areas and climate change adaptation in Asia

Ali Raza Rizvi\*

#### **Cambodia – enhancing ecosystem and human wellbeing**

The PaemKrasop Wildlife Sanctuary (PKWS) was established by Royal Decree in Koh Kong Province in southwest Cambodia. It covers around 26,000 ha and contains KohKapik, which is one of Cambodia’s three Ramsar sites and supports one of the largest and most undisturbed mangrove forests in South-east Asia. These forests play a critical role in supporting fisheries, preventing erosion, providing storm protection, conserving biodiversity and sequestering carbon. The Wildlife Sanctuary also includes terrestrial evergreen forest areas and important ecological transition zones, that connect the coastal area of Koh Kong and the nearby Cardamom Mountains.

#### **Sri Lanka – improving flood protection**

The two reserves which form the Muthurajawella Marsh, in Sri Lanka, cover an area of 3,068 ha near Colombo. The economic value of flood attenuation, has been estimated at USD 5,033,800 annually.

#### **Indonesia – increasing livelihoods resilience**

The 32,000 ha Ruteng Park on the island of Flores in Indonesia protects an important watershed. As well as clean water, the park provides timber, fuel wood and other forest products for the whole region. Researchers working with Conservation International’s Center for Applied Biodiversity Science showed that communities living around the park were healthier and experienced less crop failure than those living without intact forests. This suggests that these communities would be more resilient to the impacts of climate change, but such benefits of protected areas are not widely known.

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## 8.2. PROTECTED AREAS FOR DISASTER RISK REDUCTION

### *Ecosystem-based Disaster Risk Reduction (Eco-DRR)*

The term “natural hazard” refers to natural events such as cyclones, earthquakes and tsunamis, that can cause harm to people and property. The United Nation Office for Disaster Reduction (UNISDR) defines a disaster as “a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources”<sup>152</sup>. “Natural disasters” are natural hazards that may result in severe loss and damages to a community, due to their social, political, economic and environmental contexts. The impact a disaster has upon a community is largely determined by how a society manages its environment, how well prepared it is to face adversity and what resources are available for recovery. The United Nations International Strategy for Disaster Reduction<sup>153</sup> defines “disaster risk reduction” (DRR) as “reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events”. Until recently, the contribution of conservation and ecosystem management to disaster risk reduction has been overlooked or even undermined by poor management or badly designed artificial disaster responses, but it is increasingly being recognized by the international community as a critical approach for enhancing human security.

The phrase “Ecosystem-based Disaster Risk Reduction” (Eco-DRR) is used to demonstrate and promote ecosystem management for risk reduction. The Partnership for Environment and Disaster Risk Reduction<sup>154</sup> define Eco-DRR as “sustainable management, conservation and restoration of ecosystems to provide services that reduce disaster risk by mitigating hazards and by increasing livelihood resilience.” Ecosystem management approaches can be cost effective<sup>155</sup> when compared to alternatives like engineered infrastructure. Examples include integrated coastal zone management (ICZM), integrated water resource management<sup>156</sup>, forest landscape restoration, protected areas management and community based natural resource management. These approaches have the advantage of being already well-understood, having been tested in different contexts such as in a variety of ecosystem types, in different geographical regions and at different scales. Additionally, they are based on participatory, local ownership, social and institutional governance mechanisms – all of which are critical for DRR implementation. They facilitate holistic management approaches, have defined monitoring mechanisms and can also be effective in promoting global, regional and national dialogue and cooperation<sup>157</sup>.

The following section highlights how protected area management has been contributing to disaster management in Asia and presents key recommendations on how this approach can be recognised and strengthened for DRR.

### *Protected Area Management as an Eco-DRR Approach*

Protected areas should not be seen as isolated entities, but as part of broader sustainably managed landscapes. Experience from disasters such as the Western Indian Ocean tsunami in 2004 and the Great East Japan Earthquake and Tsunami of 2011 demonstrates that protected areas can effectively be managed to help reduce risks from natural hazards and longer term climate change impacts<sup>158</sup>.

Recent literature<sup>159</sup> documents and promotes the critical role protected areas can play in disaster risk reduction (DRR) and climate change adaptation (CCA).

Evidence suggests that protected areas play a significant role in mitigating natural hazards at various scales, and in contributing to the long term resilience of ecosystems and their dependent communities<sup>160</sup>. Not only do they serve as carbon sinks, thereby contributing to reducing climate-related hazards in the longer term, but they also maintain ecosystem integrity, buffer local climate and reduce risks and impacts from extreme events. Protected areas also assist communities in coping with gradual change (such as in water supplies and agricultural productivity) through the maintenance of essential ecosystem services, including water regulation, pollination and control of soil erosion. According to the IUCN Protected Area Management Categories Guidelines<sup>161</sup> a protected area can be an integral part of contingency planning by serving as an alternative source of resources, such as food, fuel, medicine and shelter, following a disaster.

## Box 8.2 Examples of protected area management for DRR

Radhika Murti and Camille Buyck\*

### Manas World Heritage Site and Biosphere Reserve, India

In Manas Biosphere reserve in northeast India, the indigenous tribes have successfully shown how centuries-old traditional knowledge of channelizing seasonal Himalayan Rivers can ensure the availability of irrigation and drinking water in an otherwise water-deficit (*Bhabhar*) geological region. Popularly known as the *Dong bundh* system of Subhankhata forests, the community-constructed micro-dams help check soil erosion and floods and have significantly contributed towards disaster risk reduction in the downstream agricultural areas<sup>162</sup>.



### Bangladesh: The Sundarbans

Sundarbans is the source of livelihood of about 3.14 million people and also acts as a barrier against natural calamities. It protects the population in Bangladesh from tidal surges and cyclones. 3.14 million people depend upon Sundarbans for their livelihood and hence the protection and conservation of natural resources of Sundarbans has become an important subject for Bangladesh. The forest produces fuel wood, thatching material, honey, and sea food. The revenue from eco-tourism is significant<sup>163</sup>.

### Nepal - Shivapuri National Park in Kathmandu

Protected areas can help reduce the impacts of disasters. For example, Shivapuri National Park in Kathmandu, Nepal is the main source of domestic water in the city. Floods and landslides are frequent hazards in Nepal and landslide protection measures have been implemented in 12 localities in the park.

### Sri Lanka: Reefs mitigating impact of Tsunamis

Studies carried out in Sri Lanka after the 2004 tsunami, noted that in Hikkadawa, where reefs are in a marine park and are protected, damage reached only 50m inland, while in Peraliya, a nearby area, where extensive coral mining damages reefs, damage and flooding reached up to 1.5 km inland.

### Japan: Natural solutions to restore and protect areas impacted by Tsunamis in Japan

After the devastating effects of a Tsunami on the Pacific coastal area of the Tohoku region in 2011, a new national park was designated by Japanese authorities. The Sanriku Fukko (fukko means reconstruction in Japanese) National Park, which covers around 550 square kilometers of marine and coastal ecosystems, is now Japan's most ambitious restoration project. It will use protected areas as green infrastructure to minimize impacts of disasters on coastal populations and promote tourism to enhance economic development in the region<sup>164</sup>.

\*IUCN

### 8.3. PROTECTED AREA MANAGEMENT FOR CCA AND DRR IN ASIA - OPPORTUNITIES AND CHALLENGES

Although recent studies<sup>165</sup> have documented the crucial role of protected areas in climate change adaptation and disaster risk reduction, this role is not yet fully appreciated. Protected areas play a significant role in mitigating natural hazards at various scales, and in contributing to the long term resilience of ecosystems and their dependent communities. Protected areas are often better for CCA and DRR than natural ecosystems under other forms of management because they already have established management and governance structures, which include management plans, policies, laws and institutions, and furthermore are backed by many international conventions such as CBD, Ramsar and CITES. Moreover, they have defined borders that can be used to measure carbon sinks and other ecosystem services and most have already existing data sources, which can establish baselines for further research (e.g. IUCN Protected Area Management Categories, Red Lists, the World Database on Protected Areas, etc.).

The protected area network in the Asia landscape plays a crucial role in CCA, DRR and sustainable development. Most of the countries in the Asia Region are developing countries and have focused on economic development models for poverty alleviation. These approaches have put tremendous pressure on natural resources. Consequently, the capacity of the protected area networks to provide the ecological services that contribute towards CCA and DRR has been adversely affected. In addition, this pressure has created conflicts between people and wildlife, leading to more degradation of fragile landscapes. It is challenging for the governments to create the space in the economic model to pay back for the services and the contributions which the protected area networks have been providing to these nations. Hence the lack of financial resources and political commitment to improve the situation of protection and management of the protected area networks has not been prioritized<sup>166</sup>.

#### **Box 8.3 Reducing disaster risks to mangrove forest livelihoods through watershed-based protected area management in Koh Kong Province in Cambodia**

In Peam Krasaop Wildlife Sanctuary, the barrier beach on the seaward side of mangroves is retreating landwards, probably because of river sand mining and sea level rise. As a result, fishing villages are becoming increasingly vulnerable to coastal hazards. Forest conservation, already initiated by IUCN, will improve the consistent flow of freshwater and sediment from the upstream rivers to the ocean, thereby reducing barrier beach migration and coastal disaster risks. This highlights the importance of protected area management that accounts for hydrological connectivity from the upstream watershed to the coast, and to build greater coastal resilience in mangrove-dependent communities<sup>167</sup>.

Some of the common threats to the PA network in Asia have been illegal logging; diversion of forest lands for big development projects like dams, mines etc.; illegal poaching and wildlife trade; illegal grazing; forest fires; and encroachment on forest lands for agriculture due to growing human population (see Chapter 2). Presently there is an urgent need to mobilise support from all the stakeholders to address these threats. It is also important to raise understanding among public, governments (State/Union/ provincial) and policy makers/ politicians about the real contribution of protected area through ecological services and their role in CCA and DRR. A wider understanding of the multiple services that PA networks provide, including CCA and DRR, is critical to the case for securing additional resources and political commitment for managing them<sup>168</sup>.

## 8.4. CONCLUSIONS AND FUTURE DIRECTIONS

Currently there is little active management of protected areas for DRR or CCA. Disaster management policies, climate change strategies and environment management policies are not harmonised, so there is no operative framework for protected areas to contribute to DRR and CCA in Asia. Consequently, there is a critical need for awareness raising and capacity building on this issue amongst both protected area managers, practitioners of climate change adaptation and disaster risk managers. IUCN and UNISDR conducted a capacity building workshop for protected area managers of five South Asia countries in October 2010. It was evident from this workshop that there is not only a need for awareness raising amongst protected area managers about the strong links between protected area management, CCA and DRR, but a keen *interest* and *demand* from the protected area managers to understand these links and enhance the implementation of protected areas for CCA and DRR.

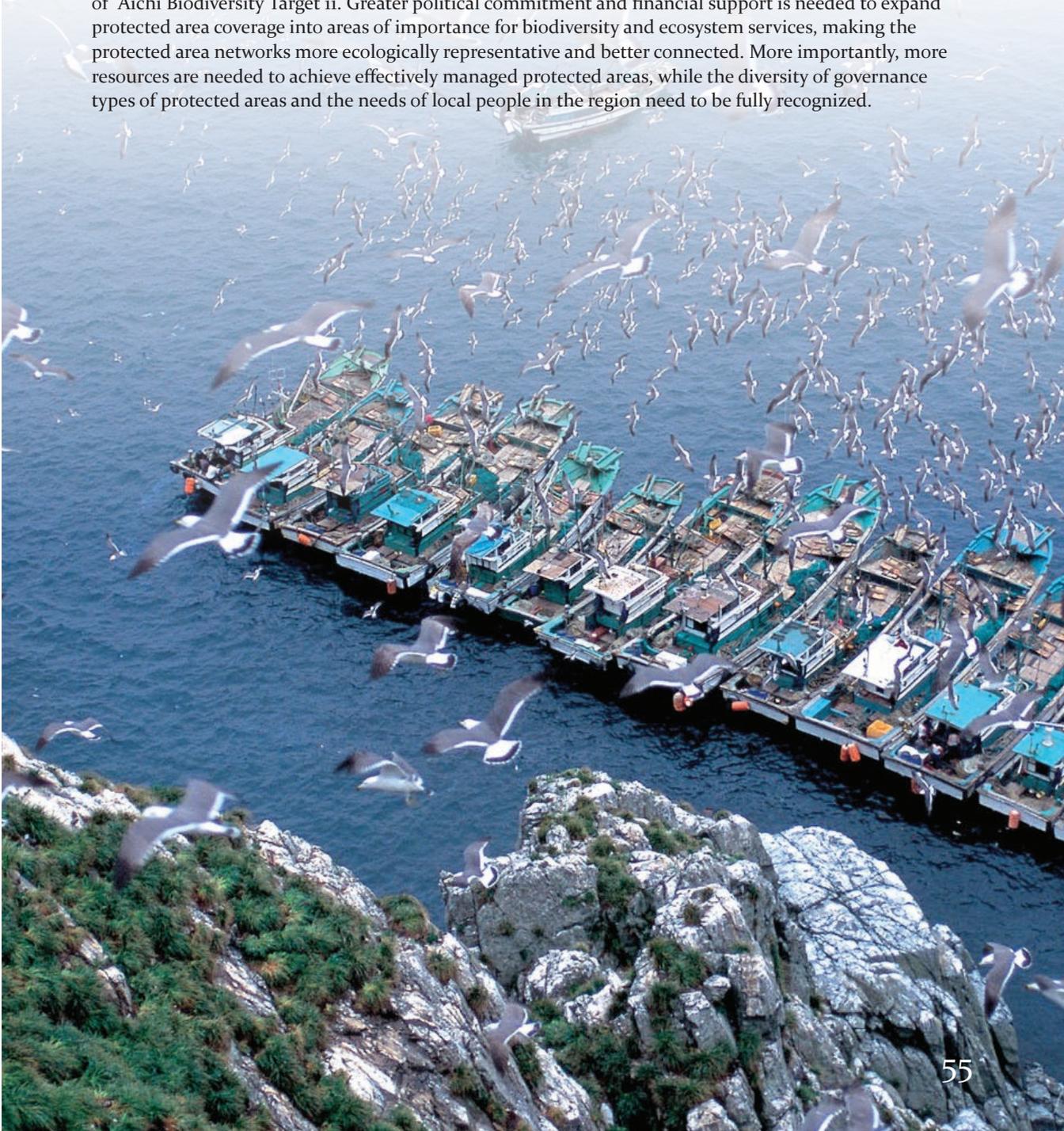
Key recommendations arising from this workshop and through formal and informal consultations with protected area managers in Asia, are summarized below:

- **Advocacy** - Defining and highlighting the role of ecosystem services within protected areas and explaining how they contribute to CCA and DRR should be a priority for regional and national policy dialogues and platforms. With this understanding in place, more robust hazard risk reduction and adaptation strategies can be established to help communities cope better with natural hazards. It is also critical to carry out sensitization of elected peoples' representatives on the role of protected areas in DRR and CCA.
- **National Disaster Management (DM) Plans** - National and district level DM plans need to include the role of protected areas in reducing hazards, regulating climate and sustaining livelihoods, which will also strengthen the advocacy for effective management of protected areas.
- **National Adaptation Programmes of Action (NAPAs)** can include recognition of existing protected areas and strengthening of protected areas management for DRR and CCA, as well as for multiple benefits they provide to local communities.
- **Joint capacity building** - protected area managers, DM planners, relevant policy makers and agencies for CCA should have joint capacity building to promote the involvement of protected area managers in DM Plans and engagement of DM planners with protected area management. In addition local and national government authorities need awareness-raising workshops to recognise the role of protected areas in their own policies, and case studies can be used to communicate the messages effectively.
- **Payment for Ecosystem Service schemes** - levying ecosystem service charges and channeling these service charges back to the local communities near a protected area can provide incentives to communities to protect the ecosystem services. Assessments of willingness to pay and feasibility of the schemes need to be carried out focused particularly on likely users of protected area assets (e.g., hoteliers, water users). There is a need for greater use of the study "The Economics of Ecosystems and Biodiversity"<sup>169</sup> and tools such as REDD++ to arrest forest degradation to enhance the role of protected areas in DRR and climate change resilience building.
- **Community based protected area management** - setting up of local level/villager committees for protection and benefit sharing from protected areas should be prioritized. This will promote ownership of assets/natural infrastructure that is critical for protection of lives and livelihoods from natural hazards and adapting to impacts of climate change in the longer term.
- **Research and information sharing** - information on the role and contribution of protected areas in natural hazard risk reduction and climate change adaptation should be strengthened through long term monitoring and documentation. Information should be articulated in the appropriate technical language for various audiences – DM planners, protected area managers, land use planners, climate change practitioners, local communities, etc.
- **Resources** - It is important for environment (e.g. protected area managers) and DRR practitioners to acquire additional resources for actively managing protected areas for CCA and DRR. This can be done jointly.

## 9. Conclusions and Key Messages

Asia is a culturally and biologically diverse region, with a wide range of species and ecosystems providing numerous benefits to people. However, the region's natural resources are under increasing pressure from population growth, rapid economic development and rising socio-economic aspirations. There is an urgent need to integrate protected areas into national economic planning and to consider the benefits of protected areas at all scales.

This report assesses progress towards Aichi Biodiversity Target 11 of 24 Asian countries (see section 1.2.) referred to as the Asia Region. It shows that the Asian region does not meet any of the different elements of Aichi Biodiversity Target 11. Greater political commitment and financial support is needed to expand protected area coverage into areas of importance for biodiversity and ecosystem services, making the protected area networks more ecologically representative and better connected. More importantly, more resources are needed to achieve effectively managed protected areas, while the diversity of governance types of protected areas and the needs of local people in the region need to be fully recognized.



In 2012, a number of priority actions were recommended to track progress and accelerate implementation towards achieving Aichi Biodiversity Target 11 at a global level<sup>170</sup> (see Table 9.1). Some of these priority actions remain relevant and applicable for the Asia Region. For example, no indicators on protected area coverage of ecosystem services and connectivity are available for the Asia Region or at a global level. Regional studies that aim to address this gap in the Asia Region could contribute significantly towards developing global indicators for these aspects of Aichi Biodiversity Target 11.

**Table 9.1** Priority actions to track progress and accelerate implementation of Aichi Biodiversity Target 11 at a global level. Adapted from Bertzky et al. (2012)

Priority actions for tracking progress towards Aichi Biodiversity Target 11
1. Enhance national reporting to the datasets that are being used to track global progress towards Target 11.
2. Support efforts to improve the data in the WDPA through expert review and completion of incomplete attributes, (e.g. management categories, governance types).
3. Better integrate the WDPA with other relevant datasets and indicators such (e.g. the IUCN Red List of Threatened Species, Key Biodiversity Areas, Living Planet Index).
4. Support the identification of important sites for biodiversity and ecosystem services including Alliance for Zero Extinction sites and other Key Biodiversity Areas.
5. Support further development of existing global datasets and indicators to provide better information.
6. Provide further guidance on elements of Target 11 such as “other effective area-based conservation measures”, “equitably managed” and “well connected”.
7. Support the development of datasets and indicators on other elements of Target 11 relating to the management, governance, financing and connectivity of protected areas.
Priority actions for accelerating implementation of Aichi Biodiversity Target 11
1. Accelerate the targeted expansion of the global protected area network in terrestrial, inland water and marine areas.
2. Improve understanding of the benefits of protected areas for conservation of biodiversity and ecosystem services.
3. Expand management effectiveness assessments to include more protected areas, data on biodiversity outcomes, social costs and benefits of protected areas.
4. Strengthen the involvement and capacity of local communities and other stakeholders in protected area establishment and management.
5. Assess funding needs for implementation of Target 11 and the PoWPA goals and secure sustainable funding for protected area establishment and management.
6. Improve the connectivity of protected areas and their integration into surrounding landscapes and seascapes.

In addition, an agreed definition and data collection on other governance types for protected areas and “other effective area based conservation measures” is needed<sup>171</sup>. Recognizing and reporting these governance types will improve the understanding of protected area networks in the region as well increase data collection on “other effective area based conservation measures”. As this report shows, expansion of terrestrial, inland waters, and especially of marine protected areas is needed. This expansion must be targeted to areas of importance for biodiversity (e.g. Key Biodiversity Areas) and to achieve ecologically representative and well connected systems of protected areas. Systematic Conservation Planning (SCP) tools and techniques can be used to achieve this. SCP is a target-based approach that uses spatial prioritization techniques for defining conservation priority areas within landscapes and seascapes<sup>172</sup>. As such, it can assess trade-offs and opportunity costs for expanding protected area networks. Some examples of use of SCP in the Asia Region include Indonesia<sup>173</sup> and Vietnam<sup>174</sup>.

## KEY MESSAGES

- **Protected areas in Asia are the last remaining strongholds for biodiversity**, for preserving natural capital and providing ecosystem services to vulnerable local communities. Yet, the threats they face mean that they are at risk of losing the biodiversity values they were created to protect.
- **Main threats to protected areas in the Asian region are habitat degradation and exploitation of biodiversity due to high population densities (1.5 times the global average) and increasing demands from a globalised market.** In consequence, illegal wildlife trade, deforestation, pollution, invasive species, energy production and mining are serious threats that hinder protected areas being effective in conserving biodiversity.
- **Site-based strategies and policy strategies are urgently needed to address these threats.** These include increasing law-enforcement protection at local scales, creating partnerships with the private sector, demanding reduction campaigns for wildlife products, reforming governments policies, and implementing implementation of multilateral environmental agreements more effectively.
- **Protected areas in the Asia Region cover 13.9% of the terrestrial and inland waters and 1.4% of the seas within national jurisdiction (0-200 nautical miles).** Only 9 countries of 24 meet the goal of having at least 17% of terrestrial ecosystems under protected areas. No country has 10% of the marine and coastal areas under protected areas. Protected area coverage in the area between 12-200 nautical miles is critically low at 0.04%.
- **Governments in the Asia Region have to renew their political commitment to protected areas, ensuring the integrity of protected areas systems within a context of rapid economic and political change.** Despite positive progress between 1990 and 2010, the growth of protected areas seems to have slowed down in the past 4 years. In addition, there is a need to understand and effectively address degradation, deforestation and degazettement of protected areas in Asia.
- **Protected areas in the Asia Region are not ecologically representative.** Only 16% (326) of IBAs and AZE sites are completely covered by protected areas (whole site under a protected area designation). Using ecoregions of the world as a proxy of ecoregion coverage by protected areas reveals that only 33.5% of terrestrial ecoregions and 15.4% of marine ecoregions are adequately represented. More detailed analyses are needed to obtain a detailed picture on the representativeness of Asia's region protected area network for terrestrial, freshwater and marine biodiversity.
- **An assessment of levels of protection of areas important for ecosystem services in the Asia Region is required.** There are many examples of protected areas currently protecting important ecosystem services. However, there is no regional scale or national study that assesses where areas of importance for ecosystem services are located and to what extent they are covered by protected areas.
- **More efforts by protected area agencies are needed to assign IUCN Management Categories to all protected areas.** This will improve understating of the type of protected areas that exist and what they are managed for. Marine and terrestrial protected areas in the Asian region are mainly classified as IUCN Protected Area Management Category IV (Habitat/Species Management), V (Protected Landscape/ Seascape) and VI (Protected areas with sustainable use of natural resources) with 77% of protected areas classified under these categories. However, no IUCN Management Category has yet been assigned to 12.2% of terrestrial and 26% of marine protected areas.
- **Management of protected areas in the Asia region needs to be improved** by disseminating best practices and tools for protected area management to protected area managers (e.g SMART for law enforcement, PES schemes etc.) and improving allocation of funds to protected area management and law enforcement to avoid unsustainable use of natural resources.
- **More progress in management effectiveness of protected areas is needed in the Asia Region.** In 2013, only 8 (Bhutan, Brunei Darussalam, Cambodia, Lao PDR, Mongolia, Nepal, Singapore, Republic of Korea) of the 24 countries included in this report had met the 60% assessment target in 2013, while 13 had met the 30% target.

- **Protected area systems in Asia have primarily been established by respective country governments.** All four IUCN governance types are represented in the WDPA but sub-national and national governance seems to be predominant, accounting for 60% of protected areas. In 2014, 39% of sites had no IUCN governance type assigned. To get a clearer picture of how decision-making power is distributed across the Asia Region, the governance type of all sites would need to be known.
- **Governance regimes of protected areas, including 'other area-based measures' in Target 11 need to be strengthened** and decision makers need to ensure that governance is not an end in itself, but linked ultimately to protected area outcomes. In recent years, there has been a move towards greater shared governance, and towards recognition of non-government governance types. However, this fact is still highly under recorded for this region and true extension of these governance types is unknown.
- **Investigating the feasibility of expanding and combining existing protected area networks into a pan-Asian protected area system is a high priority** within the World Commission on Protected Areas (WCPA) Asia strategy for 2011-2014. In recent years, there has been a proliferation of large scale conservation projects that consider connectivity for protected areas. Notable examples include the Coral Triangle Initiative (CTI), Heart of Borneo initiative (HoB), the East Asian-Australasian Flyway Partnership (EAAFP), or the Greater Mekong Sub-region Core Environment Program. However, fewer broad scale studies on the subject of protected area networks have been conducted in Asia compared to other regions of the world.
- **Defining and highlighting the role of ecosystem services within protected areas and explaining how they contribute to CCA and DRR should be a priority for regional and national policy dialogues and platforms.** Currently there is little active management of protected areas for disaster risk reduction (DRR) and climate change adaptation (CCA). However, recent literature documents and promotes the critical role protected areas can play in supporting these. Experience from disasters such as the Western Indian Ocean tsunami in 2004 and the Great East Japan Earthquake and Tsunami of 2011 demonstrates that protected areas can effectively be managed to help reduce risks posed from natural hazards and the longer term climate change impacts.

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*Tracking progress towards targets for protected areas in Asia*

The Asia Protected Planet Report 2014 reviews progress towards the achievement of international protected area targets of 24 Asian countries, through analysis of status and trends in regional biodiversity protection. The resulting synthesis is a key source of information for decision makers and the conservation community.

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