#3

South Asia

Historically, elephants have played an important role in cultural and economic life in South Asia. However, hunting and habitat loss have reduced the population, and today there may be only 50 000 Asian elephants left in the wild: about half of them in India, a smaller number in Sri Lanka, and a few hundred in Nepal.

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List of abbreviations and acronyms

ADB	Asian Development Bank
BTFEC	Bhutan Trust Fund for Environmental Conservation
BIOFIN	Biodiversity Finance Initiative
CBD	Convention on Biological Diversity
CCA	community conservation areas
CEPF	Critical Ecosystem Partnership Fund
CFUG	community forest user groups (Nepal)
CITES	Convention on International Trade in Endangered Species
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CSO	civil society organisation
DAC	Development Assistance Committee
DFID	Department for International Development, UK
EBA	endemic bird area
EIA	environmental impact assessment
EU	European Union
EUR	euro
G200	Global 200 Ecoregions
GDP	gross domestic product
GEF	Global Environmental Facility
GHG	greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GSLEP	Global Snow Leopard and Ecosystem Protection Programme
IBA	important bird area
ICIMOD	International Centre for Integrated Mountain Development
ITHCP	Integrated Tiger Habitat Conservation Programme
IUCN	International Union for the Conservation of Nature
JICA	Japan International Cooperation Agency
KBA	key biodiversity area
KfW	German government-owned international development bank
KLC	key landscape for conservation
MAB	Man and Biosphere (UNESCO programme)
MIP	multiannual indicative plan
M-STrIPES	Monitoring System for Tigers. Intensive Protection and Ecological Status
$MtCO_2e$	megatonnes of carbon dioxide equivalent
NBSAP	national biodiversity strategy and action plan
NGO	non-governmental organisation
NTFP	non-timber forest products
ODA	Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
PA	protected area
PATA	Provincially Administered Tribal Areas (Pakistan)
PES	Payments for Ecosystem Services
PRC	priority region for conservation
REDD+	Reducing emissions from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks
SAWEN	South Asia Wildlife Enforcement Network
SDG	Sustainable Development Goal
SLAWEN	Snow Leopard and Wildlife Law Enforcement Network
SMART	Spatial Monitoring and Reporting Tool
tCO_2e	tons of carbon dioxide equivalent
UK	United Kingdom
UN/UNDP/UNEP	United Nations/Development Programme/Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UNODC	United Nations Office on Drugs and Crime
USA	United States of America
USAID	United States Agency for International Development
USD	US dollar
WWF	World Wide Fund for Nature

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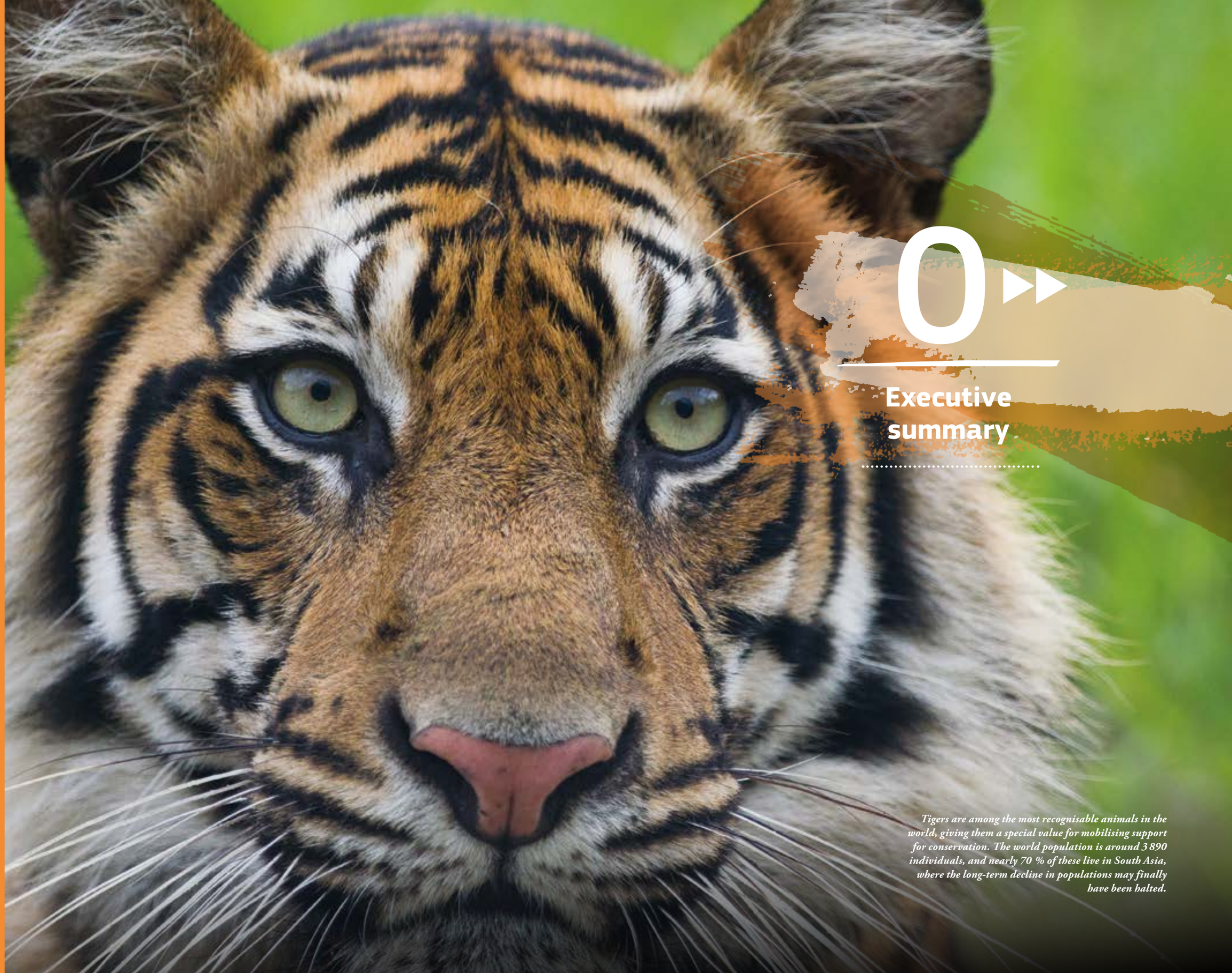
Executive summary



Tigers are among the most recognisable animals in the world, giving them a special value for mobilising support for conservation. The world population is around 3 890 individuals, and nearly 70 % of these live in South Asia, where the long-term decline in populations may finally have been halted.

The Himalayan monal inhabits temperate oak-conifer forests above 2000 m in Bhutan, India, Nepal and Pakistan. It is hunted but remains relatively common.

The Western Ghats, India, are a chain of mountains that are a hotspot for biodiversity and a source of water for the lowlands to the east. Eravikulam National Park protects forests and high-altitude grasslands, as well as the largest population of an endemic sheep, the Nilgiri Tahr.

0 _ Executive summary

This South Asia regional chapter of the *Larger than Tigers* report provides inputs to guide the EU's strategic approach to biodiversity conservation in Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka. It describes the key features of biodiversity in the region, identifies the main threats to its survival, compiles lessons learned from past and present activities, identifies priority needs and proposes strategic approaches appropriate for support by the EU and other donors.

The six countries covered by this volume are home to 1.7 billion people, almost a quarter of the global human population. The region is undergoing a rapid demographic transition, with an explosion in the working-age population and falling birth rates coupled with rapid urbanisation. Poverty remains a major problem, often affecting marginalised rural populations which depend on some of the most biodiversity-rich landscapes for their livelihoods. The challenges of biodiversity conservation in South Asia are, therefore, those posed by rapid economic growth and rising consumption, as well as those caused by poverty and marginalisation. The threats also come from outside the borders of the region, with the illegal trade in wildlife products and parts affecting hundreds of species.

South Asia has a diverse range of ecosystems, from the permanent snowfields of the Himalayas to lowland forests and mangroves, with important areas of grasslands and wetlands. Large numbers of unique and threatened species are associated with this diversity of ecosystems. Regions of exceptional diversity can be identified, such as the Western Ghats and the eastern Himalayas. Amongst the charismatic mega-fauna, the region is the global stronghold for tiger, Asiatic lion and greater one-horned rhinoceros. It also holds important populations of Asian elephant.

The governments of the region have taken action to protect their wild species and habitats, establishing some 1 625 protected areas covering 361 357 km², or around 8 % of the land surface. However, the effectiveness of these areas varies widely, and not all are able to maintain the biological values for which they were created. Governments, civil society and increasingly the private sector are taking action to improve the effectiveness of protected areas, but the current level of effort is not yet reducing species' population loss.

The wise management of resources is not a new concept in many parts of the region, with sustainable resource use built into many of the customary norms and practices of the region's thousands of indigenous groups. South Asia is a leader in models of local participation in the management of natural resources, including, increasingly, collaborative management of protected areas.

Based on an analysis of the threats and current conservation initiatives, the strategic approaches proposed in this chapter cover five broad areas, outlined below.

- Priorities for protected areas include greater support to ensure more effective management of existing areas and expansion of protected area networks to cover species and ecosystems that are poorly represented. This requires attention to policies, funding arrangements, institutional capacity and relationships with other stakeholders.
- Expansion of the sustainable management of landscapes is important because it integrates livelihoods and commercial activity with biodiversity conservation objectives. Priorities include improvements in the use of tools for planning land use, safeguards, and expansion of markets and mechanisms which reward sustainable land use.
- Protected areas and sustainable landscapes will be supported by a shift towards greener economies, with an emphasis on de-coupling growth from environmental destruction and leveraging investment in green infrastructure and business.
- Addressing the threat posed by the illegal wildlife trade requires action including (i) the intensification of investigation and enforcement efforts, (ii) enhancement of regional cooperation, (iii) greater support to the implementation of international agreements, and (iv) capacity development for the responsible authorities.
- Finally, a sub-set of the threatened species in the region is not going to be saved by protected areas and landscape approaches. They therefore require species-level action to avoid their extinction.

1

Background

The red panda lives in montane forests in the Himalayas of Bhutan, India and Nepal, as well as Myanmar and China. It is considered 'endangered' as a result of habitat fragmentation and destruction, infection with canine distemper and hunting.

1 _ Background

The region covered by this study encompasses Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka. South Asia is a global centre of economic growth, with several global hotspots for biodiversity, making the challenge of balancing economic development and environmental conservation particularly critical.

The chapter covers wild biodiversity, and does not discuss the conservation of domesticated species and varieties. However the conservation of wild and domesticated biodiversity is closely linked. Firstly, because the forests, wetlands and grasslands of the region hold the wild relatives and genetic origins of many of the domesticated plants and animals that humans depend upon today, and secondly because traditional multifunctional land-use systems are important for both wild and domestic biodiversity – and both are equally threatened by the uncontrolled spread of homogenous, capital-intensive, industrial agriculture.

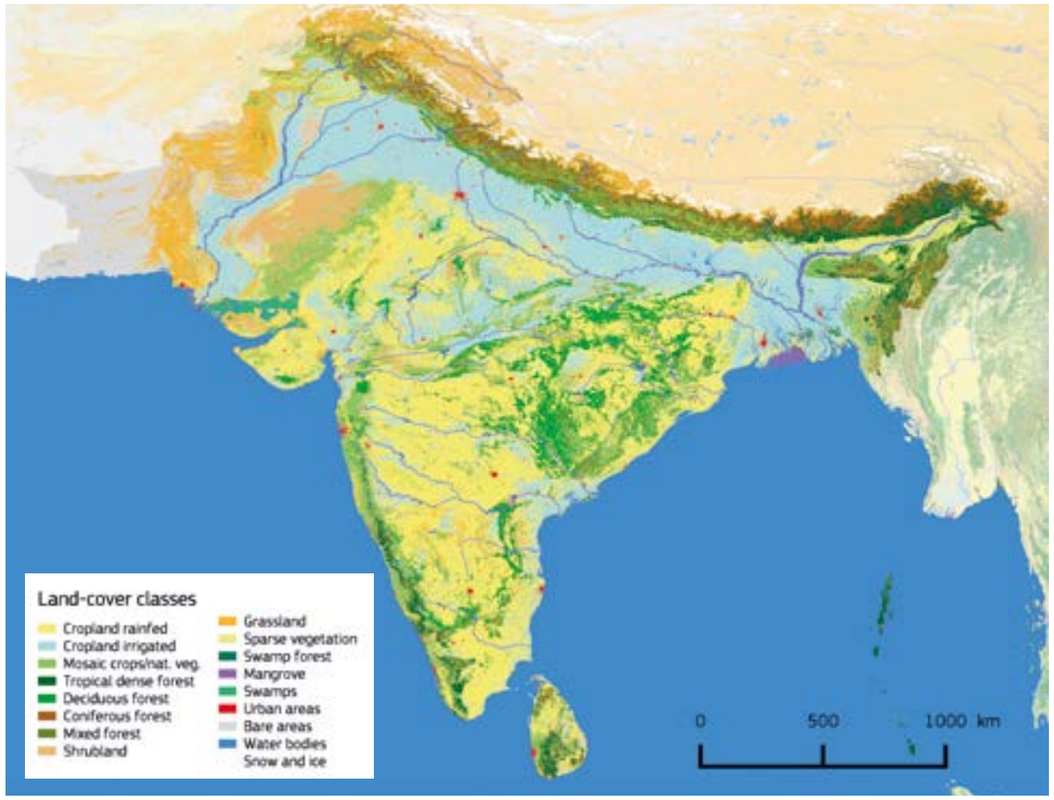
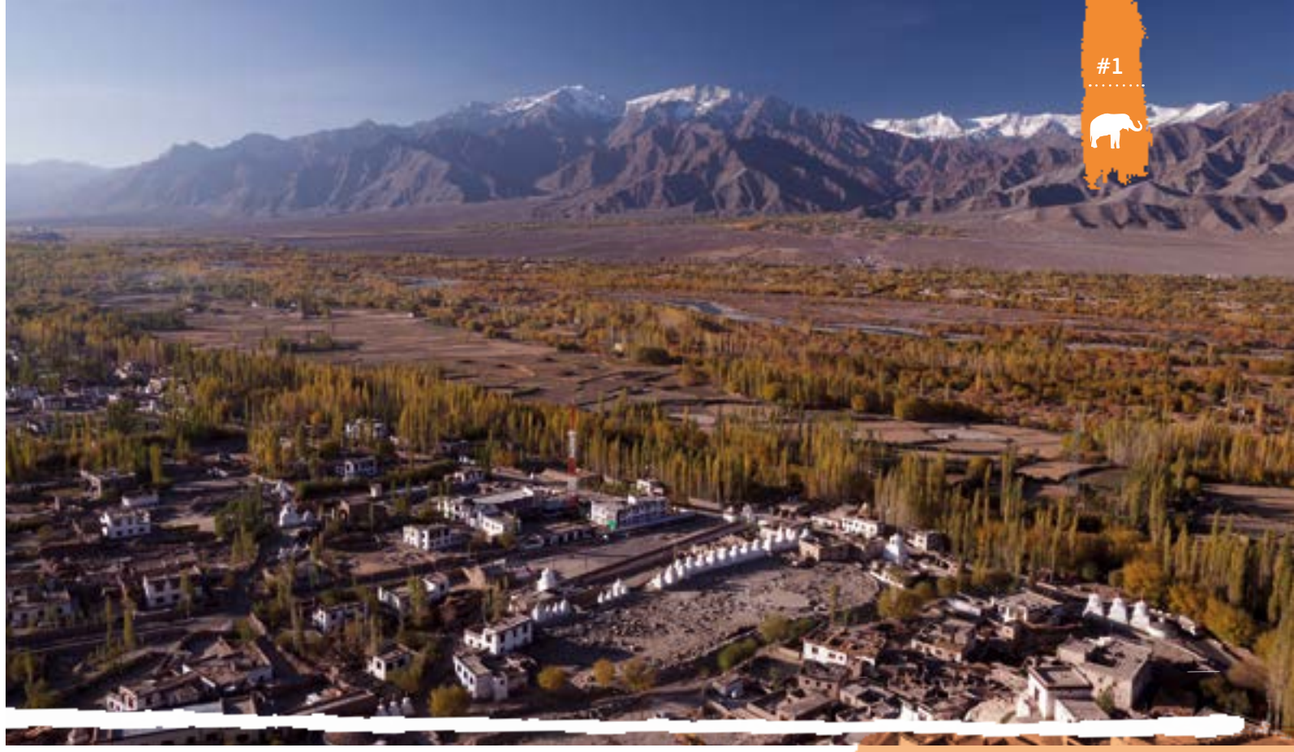


Figure 1.1 Land cover map of the South Asia region



Indus river valley, Ladakh, India. The Indian sub-continent was home to early civilisations and has long been a centre for trade between east and west.

1.1 Socio-economic setting

1.1.1 Political and administrative context

Home to the ancient Indus Valley civilization and a region of historic trade routes and vast empires, the Indian subcontinent has been identified with its commercial and cultural wealth for much of its long history[1]. There are marked variations in political stability, economic development and governance between the countries.

Bangladesh was founded as a constitutional, secular, democratic, multiparty, parliamentary republic and is currently divided into eight administrative divisions (*bibhags*). After independence, Bangladesh endured periods of poverty and famine, as well as political turmoil and military coups. The restoration of democracy in 1991 has been followed by economic progress.

Pakistan is a federal republic that gained independence in 1947 and has had a long history of alternating periods of electoral democracy and military government, a function of its struggles for independence from India and difficulties establishing rule of law within its borders. In large parts of Pakistan's two northern provinces (an area of significant biodiversity), the central government has never had a significant foothold.

Bhutan has been a constitutional monarchy since 2008 when it adopted its first modern constitution codifying the institutions of government and the legal framework for a democratic multi-party system. Bhutan is divided into 20 districts (*dzongkhag*).

India is a large sovereign, socialist, secular, democratic republic with a parliamentary system of government. It is governed as 29 states and 7 union territories. The 73rd and 74th Constitutional amendments gave considerably increased powers to local governments, including greater financial and administrative autonomy and there is a move towards more transparency and civil society participation in governance.

Nepal was unified as a single kingdom in the 18th century, and introduced parliamentary democracy in 1951. At the end of the civil war, the monarchy was abolished and in 2008 the country became a federal secular parliamentary republic. There have

(1) Stein B. (1998). A History of India (1st ed.). Wiley-Blackwell, Oxford. ISBN 978-0-631-20546-3.

South Asia is home to almost a quarter of the human population, and India will surpass China as the world's most populous country in around 2022. Despite the growing population, all the countries in the region have succeeded in reducing the absolute number of people living in poverty and have increased their human development index.

Tea plantation, Sri Lanka. Tea accounts for 2 % of the country's GDP. Agriculture remains important to South Asian economies, but they have grown and diversified rapidly to include manufacturing, services and technology.

been significant steps towards sustainable peace and inclusive democracy, including holding elections in 2008 and 2013, but some outstanding commitments in the Comprehensive Peace Agreement and subsequent agreements have not yet been completed, including the drafting of a new constitution, continued security sector reform, transitional justice, and land return and reform[2].

Sri Lanka is the oldest democracy in Asia[3]. Modern Sri Lanka is a democratic republic and a unitary state, which is governed by a semi-presidential system,[4] as 25 districts organised into 9 provinces. Emerging from decades of civil conflict, Sri Lanka aims to strengthen democratic processes, reinforcing accountability of government bodies and aiming for sustained peace and prosperity.

1.1.2 Population, livelihoods, and development

This densely populated region is home to 1.7 billion people, almost a quarter of the global human population. Bangladesh, with 1 064 persons/km² is the most densely populated followed by India (390 persons/km²), Sri Lanka (320 persons/km²), Pakistan (217 persons/km²), Nepal (190 persons/km²) and thinly populated Bhutan (20 persons/km²).[5] However, there is much variation within these countries. In Pakistan's rural northern mountains (Gilgit-Baltistan and Khyber Pakhtunkhwa) there are less than 15 million people, averaging roughly 25 persons/km². The Sundarbans region of Bangladesh is one of the most densely populated regions in the world, creating the conditions for human-wildlife conflict linked to unsustainable use of natural resources. The South Asia region is experiencing an unprecedented pace of demographic transition, with an explosion in the working-age population and a fall in birth rates in the last three decades that took a century in Europe.[6] All countries in the region have experienced high levels of urbanisation[7], although Bhutan remains predominantly rural.

The region is extremely ethnically diverse. Indigenous hill tribes and other minority ethnic communities reside within and adjoining protected areas (PAs), significantly influencing natural resource-use patterns and defining the human-wildlife interface. In India, for example, nearly 250 million people live in and around forests, with an estimated 100 million of them being indigenous. In the Indian Western Ghats these include Adivasis (hill tribes), the Todas and Soligas of the Nilgiris, and the Kadar, Muthuvar and Malai Malasar communities in the Annamalai Hills[8]. In the mountains of Pakistan's Gilgit-Baltistan Province, over eight different languages are spoken among the tribes. For many of these people, wild biodiversity forms an important component of their livelihoods, with activities ranging from natural resource gathering for income generation, cultivation of subsistence and cash crops, to limited employment with the forest department and in private plantations. In the Bangladesh portion of the Sundarbans, approximately 3.5 million people use natural resources, including fish, shrimp, firewood, palm fronds, honey and wax.[9] The Gonds and the semi-nomadic Baigas occupy parts of the central Indian landscapes, while in north-east India and south-east Bangladesh, various hill tribes practice shifting cultivation (*jhum*).

Between 1990 and 2015, South Asia achieved a 66 % reduction in the number of people living on less than USD 1 a day and a reduction in the proportion of undernourished people from 24 % to 16 %.[10] Despite a growing population, the number of poor people declined by 26 % in 10 years in Bangladesh. Sri Lanka, Bhutan and India have also shown significant reduction in poverty over the past two decades. The countries in the region have seen an increase in the Human Development Index[11] in the past decade, with the largest improvement in Sri Lanka. Nepal remains ranked as a country with low human development, while Bangladesh, Bhutan and India are ranked as countries with medium human development. Progress in combating population growth, hunger and child mortality is in part due to active civil society engagement and micro-finance schemes in Bangladesh, and a greater participation of women in economic and political activities, especially in Bangladesh, India and Sri Lanka. However, poverty remains a challenge in India, Pakistan, Nepal and Bangladesh, and will continue to influence the impact of conservation interventions. In Bhutan, significant achievements in social development have also been made in recent years, with the number of poor approximately halved between 2007 and 2012.

(2) https://www.cartercenter.org/resources/pdfs/news/peace_publications/election_reports/nepal-2014-final.pdf
(3) Norton J.H.K. (2001). India and South Asia.: McGraw-Hill, United States of America. ISBN 978-0-07-243298-5.
(4) Constitution of the Democratic Socialist Republic of Sri Lanka, revised edition – 2015. Available at: http://www.parliament.lk/files/pdf/constitution.pdf
(5) http://www.adb.org/sites/default/files/publication/183338/basic-statistics-2016.pdf
(6) http://www.asia-pacific.undp.org/content/dam/rbap/docs/RHDR2016/RHDR%202016%20Key%20Messages.pdf
(7) World Bank 2016. Leveraging urbanization in South Asia. Available at https://openknowledge.worldbank.org/bitstream/handle/10986/22549/9781464806629.pdf?sequence=17&isAllowed=y

(8) Chandi M. (2008). Tribes of the Annamalais: livelihood and resource-use patterns of communities in the rainforests of the Indira Gandhi Wildlife Sanctuary and Valparai plateau. NCF Technical Report No 16, Nature Conservation Foundation, Mysore.
(9) http://www.forestpeoples.org/sites/fpp/files/publication/2010/08/resuscitatingsundarbansapr08eng_0.pdf
(10) http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf, accessed 3 March 2016.
(11) http://hdr.undp.org/en/content/human-development-index-hdi

1.1.3 Economy

Economic expansion in the South Asia region through agricultural intensification, industrialisation and infrastructure development will pose a serious challenge to biodiversity conservation over the next decade.[12]

Bangladesh has been one of the most successful developing countries in the region in terms of accelerating growth, ensuring that the poor benefit, and improving the indicators of social progress.

Bhutan's economic growth accelerated in 2015. It is heavily based on hydropower development, which contributes about a fifth of its gross domestic product (GDP). Despite notable socioeconomic progress, the challenge remains for Bhutan to expand its economic base and make its growth more inclusive, especially for unemployed youth and women. Developing Bhutan's private sector is crucial to diversifying the economy and generating jobs.[13]

With over 1.2 billion people and the world's fourth largest economy, **India**'s recent economic expansion and development is highly significant for the region. Rapid economic growth fuelled by the information and communication revolution has led to the emergence of India as the centre of entrepreneurship and innovation. India will soon have the largest and youngest workforce the world has ever seen. The country is in the midst of a massive wave of urbanisation as some 10 million people move to towns and cities each year in search of jobs.

Pakistan is the world's 24th largest economy, based on purchasing power parity, and 43rd in nominal gross domestic product (GDP). This relatively high ranking is moderated by the growth of the population from 33.7 million in 1951 to just over 190 million in 2016, making it the 6th most populous country in the world.[14] This high population level means that current per capita GDP is only USD 1 429, placing it among the world's lower-middle income countries. Conflict, weak governance, social instability and other deficiencies remain serious challenges.

Nepal has made some socioeconomic progress in recent years and has had significant conservation successes in the midst of political and economic upheavals.[15] Literacy rates have increased, poverty rates have declined, gender disparities have narrowed and social inclusion has improved. Nepal is now striving to graduate from its least-developed country status. However, following the devastating earthquake in 2015, its economic growth has stalled and is projected to slide further due to slow recovery from this natural disaster, political strife on the Terai plains bordering India and climate change-related irregularities in the monsoons.

Sri Lanka is at a defining moment in its history. The end of Sri Lanka's 27-year conflict has opened the possibility of a new period of sustained peace and prosperity. Despite the conflict, the 2004 tsunami and the impact of the global recession, the country has achieved middle-income status. It is entering a new stage of development and, within a few years, is expected to reach upper-middle-income status.

1.1.4 Resource ownership and governance

Resource ownership and governance varies considerably across the hotspots in the region but in general, the majority of land ownership lies with the state. However, Community Conserved Areas[16] exist in a diversity of forms across the region[17]. In **Bangladesh**, land rights are insecure because of an inefficient, expensive and corruption-prone system of land titling and registration. In the area bordering the Bangladesh Sundarbans, only approximately 68 % of fishermen and crab, honey and nipa-palm collectors own land, while the remainder are landless.[18] The vast majority (95 %) of indigenous Mundas are also landless.[19] Although permanent settlements are illegal in the Sundarbans Reserved Forest, approximately 500 000 people (mostly fishermen and forest product collectors) live in towns, villages and small settlements along the northern fringe.

Bhutan nationalised its forests in 1969, then approved a National Forest Policy in 1974 that set a goal of maintaining 60 % of the land under forest cover in perpetuity, thus creating a framework for scientific management of the forests and providing for the restoration of degraded land. The Forest and Nature Conservation Act (1995) restored communities' traditional rights to use forests, allowing private forestry on privately registered lands and community forestry on government forestlands. The ensuing Forest and Nature Conservation Rules,

(12) www.undp.org
(13) https://www.adb.org/publications/bhutan-fact-sheet
(14) Population Census Organisation of Pakistan.
(15) UNDP Nepal report.
(16) Defined by the International Union for Conservation of Nature (IUCN) as natural and modified ecosystems containing significant biodiversity, ecological services and cultural values – voluntarily conserved by indigenous peoples and other local communities through customary laws or other effective means.
(17) Bhatt S., N.P. Broome, A. Kothari and T. Balasinorwala (2012). Community Conserved Areas in South Asia. Case Studies and Analyses from Bangladesh, India, Nepal, Pakistan and Sri Lanka. Kalpavriksh, New Delhi.
(18) Getzner M. and M.S. Islam (2013). Natural resources, livelihoods, and reserve management: a case study from Sundarbans mangrove forests, Bangladesh. Int J Sustain Dev Plan 8, pp. 75–87. DOI:10.2495/SDP-V8-N1-75-87
(19) Kabir D.M.H. and J. Hossain (2008). Resuscitating the Sundarbans. Customary Use of Biodiversity and Cultural Uses in Bangladesh.

Village and forested land in Nepal. In a densely populated region, community management of resources is a vital component of conservation. Nepal's 15 000 community forest user groups have been credited with helping to reverse forest degradation in the country, but ensuring equitable access to the benefits of forest management for women and minorities remains a challenge.

promulgated in 2000 and revised in 2003 and 2006, enabled a rapid expansion of community forestry, with 16 400 ha in 135 community forests by 2009, benefiting more than 6 000 households.[20] The net result of nationalisation and then subsequent reforms has been to ensure that all Bhutanese citizens – not just the wealthy landowners – can benefit from the forests, enhancing livelihoods and helping reduce poverty. However, there is large-scale conversion of forestland into non-forestry uses, and illegal forest encroachment has increased over the years. The establishment of community forests has become one of the top priorities for the Department of Forests and Parks Services, in order to empower local communities in resource management and utilisation. Human settlements and increasing populations in and around forest areas (mostly in the valleys) are making the management of forests more complex, raising the question of whether control of forest resources should be centralised or decentralised.[21]

In the Western Ghats in **India**, the most powerful institutions that control land use through land ownership include the (i) State Forest Departments and associated development corporations, (ii) government institutions such as the public works, electricity, irrigation and revenue departments, (iii) private plantation (tea, coffee, rubber, cardamom) companies, and (iv) individual landowners controlling the use of large tracts of land, including forests. Human settlements with legal and/or traditional land ownership occur within and outside protected areas all across the Western Ghats[22], including centuries-old sacred groves and forests. In the north-eastern Indian states, within the Eastern Himalayas hotspot, there are a variety of sacred forests[23], village safety and supply reserves and community-held forests, all community-owned and managed. The Indian Forest Rights Act (2006) recognises forest dwellers' rights to land, including land in the core areas of sanctuaries and national parks. In the Western Ghats, the act helped secure the rights of the Soliga tribe in the Biligiri Rangaswamy Temple wildlife sanctuary in Karnataka. Overall, however, several factors have prevented the proper implementation of the act, and its contribution to limiting deforestation or alleviating poverty has been unsatisfactory.[24] There are examples of illegal clearing of forests in an attempt to establish rights where they previously did not exist, and of contested claims within protected areas in the Central Indian states.[25]

The land tenure system in **Pakistan**, especially in the north, which is of particular concern for biodiversity conservation, is an amalgam of systems, including both formal and informal practices. Snow leopard and mountain monarch habitats are

(20) Gilmour D., B.B. Chhetri, K.J. Temphel and K. Schmidt (Eds) (2009). Community Forestry in Bhutan: Directions for the Future. Proceedings of a National Workshop, Thimphu, Bhutan, 16 to 17 April 2009. Ministry of Agriculture and Forests. Available at: https://assets.helvetas.ch/downloads/national_community_forestry_w_shop.pdf
(21) https://www.weadapt.org/sites/weadapt.org/files/legacy-new/knowledge-base/files/521c8788e61b3bhutan-serie-13-cs5-v7-for-web.pdf
(22) CEPF (2007) Ecosystem Profile: Western Ghats and Sri Lanka Biodiversity Hotspot. Western Ghats Region. Washington, CEPF. Available at: https://www.cepf.net/sites/default/files/western-ghats-ecosystem-profile-english.pdf
(23) Gadgil M. and V.D. Vartak (1975). Sacred groves of India: A plea for continued conservation. Journal of Bombay Natural History Society 72, pp. 314–320.
(24) Somanathan E., J. Krishnaswamy, F. Libois and J.M. Baland (2013). The impacts of the Forest Rights Act 2006 on deforestation, tribal warfare and poverty. International Growth Centre, Working Paper. Available at http://www.theigc.org/wp-content/uploads/2014/09/Somanathan-Et-Al-2013-Working-Paper.pdf
(25) UNDP (2012). Recognition of Community Rights under FRA in Madhya Pradesh and Chattisgarh: Challenges and way forward.

Himalayan mountains, Nepal. South Asia's diversity of landscapes and ecosystems includes the world's highest mountains, largest mangrove forest and extensive deserts, grasslands and forests.

The Bengal fox is endemic to South Asia. It occurs in many lowland habitats, but is most numerous in semi-arid grasslands. The species does well in landscapes managed for livestock, but conversion of grassland to intensive agriculture and industrial uses is gradually reducing the population across its range.

found in two provinces – Gilgit-Baltistan and Khyber Pakhtunkhwa. The current-day Gilgit-Baltistan did not formally exist as a separate administrative unit until 1970. As a semi-autonomous state, it is not fully integrated into Pakistan, and this has practical implications for the allocation and national recognition of land tenure. Parts of both provinces are considered tribal areas where land ownership and resource management are entirely local. For the remainder of both of these regions, semi-autonomous standing and physical isolation means that local communities have significant control over the use of local resources, including the allocation and recognition of land-use rights, as well as settlement of disputes. Significant parts of the rest of Pakistan suffer from poor land tenure systems, with wealthy absentee landowners owning large tracts of land and an inequitable tenure system leaving the poor with little in the way of land or rights. This has contributed to poor land management as tenants eke out a living from the land with little incentive to focus on long-term sustainability.

Nepal has been plagued by the impact of its entrenched social hierarchy and caste system on land reforms. In the forestry sector, the first-generation community forest user groups (CFUGs) have been quite successful. However, some are dominated by elites and have often excluded the most marginalised community members from benefit-sharing and meaningful participation. More recently, donor-funded projects have made inroads in the formation and reformation of forest and water user groups and the strengthening of Village Development Committees to ensure the participation of women, lower castes and ethnic minorities. Highly skewed land holdings, a significant level of landlessness and insecure land tenure are factors that significantly influence sustainable natural resource management, including wildlife conservation and protected area management.[26] Nepal's community forest programme, which is implemented by almost 15 000 CFUGs, has been credited with reversing the pace of degradation in some of the country's forests. It has also given rise to Nepal's largest civil society organisation, the Federation of Community Forest Users. Both the Federation and the CFUGs struggle with problems of elite domination and the marginalisation of women, ethnic minorities and lower castes.

Sri Lanka does not have extensive tribal forest communities and in general its PAs do not contain human settlements. Where settlements do occur in forests managed by the Forest Department, these are excluded from the surrounding PA.[27] The State owns all forestland, and community ownership and management of areas is not recognised within the legal framework.[28]

1.2 Key biodiversity features

1.2.1 Geography and climate

There is enormous variation in geography and climate across this region, from the arid salt flats of the Rann of Kutch to the highest point on earth, Mount Everest and the monsoon forests of Sri Lanka. Three of Asia's largest rivers, the Ganges, the Brahmaputra and the Meghna, flow through the region and form the largest delta in the world[29], including the vast and ecologically significant Sundarbans mangrove forests.

The Western Ghats of south-western India and the highlands of south-western Sri Lanka, 400 km apart, share similarities in their geology, climate and evolutionary history.[30] The Western Ghats, known locally as the Sahyadri Hills, are formed by the Malabar Plains and the chain of mountains running parallel to India's western coast, about 30 to 50 km inland. They cover an area of about 160 000 km² and stretch for 1 600 km from the country's southern tip to Gujarat in the north, interrupted only by the 30-kilometre Palghat Gap. The Western Ghats influence the rainfall regime of peninsular India by intercepting the south-western monsoon winds.

North of the Western Ghats, the Rann of Kutch seasonal salt marsh is a Global 200 Ecoregion. It is situated at the end of the Luni river, which drains the Aravalli Hills and flows southward to dissipate into the dry, arid salt flats represented by this ecoregion. Geographically, the ecoregion extends across the north-western Indian State of Gujarat and the Sind Desert of southern Pakistan. Since the Mesozoic, the Little and Great Ranns were extensions of the shallow Arabian Sea until geological uplift closed off the connection with the sea, creating a vast navigable lake. Over the centuries, silting has created a vast saline mudflat. The mudflat becomes flooded during the brief wet season, and then parched under the relentless, searing heat of the long dry season. Average summer temperatures hover around 44 °C but can peak at 50 °C, while the minimum winter temperature is below freezing.[31]

The Eastern Ghats is a discontinuous range of mountains situated along the eastern coast of India. It stretches from Mahanadi Basin in the north to Nilgiri Hills in the south, a distance of 1 700 km, and covers an area of 75 000 km². The average elevation of the mountain range is about 600 m and the highest peak is Shevaroy Hill at 1 700 m.

In central India, the Chhota-Nagpur dry forests are the broken and weathered relicts of a plateau, marked by a series of isolated hills. They lie between the moist deciduous forests of the Eastern Ghats and Satpura Range and the lower reaches of the Gangetic Plains. They extend across the eastern Indian states of Bihar, Madhya Pradesh and West Bengal. The area served as a refuge during the last ice age, and thus contains numerous rare and endemic species. Most of the region has a subtropical climate, with a hot dry summer followed by monsoon rains, and a cool and relatively dry winter. The average annual rainfall is about 1 371 mm.

To the east, the Sundarbans is the world's largest mangrove ecosystem. The region lies in the vast delta formed by the confluence of the Ganges, Brahmaputra and Meghna rivers, and the annual flooding of these rivers deposits highly productive alluvial soils. The freshwater ecoregion is an area where the water is only slightly brackish. It becomes quite fresh during the rainy season, when the freshwater plumes from the Ganges and Brahmaputra rivers push the intruding saltwater out.[32] The June

(26) USAID. Country Profile Nepal.
(27) http://www.cbd.int/doc/world/lk/lk-nr-04-en.pdf
(28) Nanayakkara, A. (undated) Community Conserved Areas in South Asia: Sri Lanka. Available at: https://www.iccaconsortium.org/wp-content/uploads/2016/06/kalpavriksh_sri_lanka_report.pdf

(29) Green J. (2009). Coastlines Around the World. The Rosen Publishing Group. ISBN 978-1-4358-2957-2.
(30) Western Ghats and Sri Lanka hotspot. See http://www.cepf.net/resources/hotspots/Asia-Pacific/Pages/Western-Ghats-and-Sri-Lanka.aspx
(31) http://www.worldwildlife.org/ecoregions/im0901
(32) Champion H.G. and S.K. Seth (1968). A Revised Survey of the Forest Types of India. Government of India, New Delhi.

The dhole is a wild dog, once found from Central Asia to China and the Russian Far East. It has disappeared from 75 % of its range as a result of lack of prey, disease and hunting, and is now classified as 'endangered'. The largest populations survive in the Western Ghats and central Indian forests.

Sigiriya, Sri Lanka. The Western Ghats and Sri Lanka biodiversity hotspot comprises the whole of Sri Lanka, an endemic bird area, with 23 bird species found only on the island.

The Sri Lankan blue magpie is endemic to the moist forests of central Sri Lanka. Forest loss and fragmentation, mainly due to clearance for tea plantations, have led to a decline in the population, but a moratorium on logging in the wet-zone forests has helped protect the species.

to September monsoon brings heavy rains and frequent, devastating cyclones that cause widespread destruction in this region. Annual rainfall can exceed 3 500 mm and daytime temperatures can exceed a stifling 48 °C during these monsoon months. The forest covers 10 000 km² of which about 6 000 km² are in Bangladesh.[33] The Indian part of Sundarbans is estimated to be about 4 110 km², of which about 1 700 km² is occupied by bodies of water in the forms of river, canals and creeks of widths varying from a few metres to several kilometres. The vast mangrove ecosystem along the marine, freshwater and terrestrial interfaces provides critical ecosystem functions, including protection from extreme storms, which are increasing in magnitude and frequency due to climate change.

Stretching in an arc over 3 000 km of northern Pakistan, Nepal, Bhutan and the north-western and north-eastern states of India, the Himalaya hotspot includes all of the world's mountain peaks higher than 8 000 metres, including the world's highest mountain, Sagarmatha (Mt Everest), as well as several of the world's deepest river gorges. Due to the complex and steep topography, there is large-scale climatic variability across the north-south axis. By acting as a barrier to the monsoon, the southern slopes receive much more precipitation, exceeding 2 000 mm per year in many areas, than the northern slopes that face Tibet and Central Asia. Biogeographically, the Himalayan mountain range straddles a transition zone between the Palearctic and Indo-Malayan realms[34]. This, in combination with the geological, climatic and altitudinal variations in the hotspot, contributes to the biological diversity of the mountains.

1.2.2 Habitats and ecosystems

Forests

In the Western Ghats, the wide variation of rainfall patterns coupled with the region's complex geography produces a great variety of vegetation types[35], including four major forest types: evergreen, semi-evergreen, moist deciduous and dry deciduous forests, covering approximately 20 % of the total area. There are smaller areas of wet montane evergreen forests and shola-grassland complexes in the higher elevations (1 900-2 200 m).[36] Two of India's most important elephant conservation areas, the Nilgiris - Eastern Ghats and the Anamalais-Nelliampathis, and one of the most essential landscapes for global tiger conservation, extend across this region. Hence, these forests, together with the moist deciduous forests and montane evergreen forests, provide important, contiguous habitat for the conservation of Asia's largest terrestrial herbivore and predator.

In the Himalayas, subtropical broadleaf forests occur along the foothills, temperate broadleaf forests in the mid hills, and mixed conifer and conifer forests in the higher hills. Pakistan's northern mountains contain some of the last contiguous patches of arid conifer forests (pine, spruce, fir and deodar cedar) in the Himalayas and support an extensive biological diversity. The deodar cedar from this region in particular is prized for its aromatic properties used in ornaments, incense and oils. The vegetation in central India consists primarily of tropical dry and moist deciduous forests with ravine and thorn forests occurring in areas such as the National Chambal Sanctuary.[37] While teak dominates the forests in the western and central parts of the region, an abundance of sal trees can be found in the moist deciduous forests in the eastern ranges.

Freshwater rivers and streams

The freshwater ecosystems of South Asia region are highly diverse and contain many unique species.[38] These ecosystems are heavily used, and play a critical role in the livelihoods of millions of people. Glaciers in the Himalayas are the source of many important river systems that drain vast regions of the Indian sub-continent, sustaining agriculture and livelihoods for hundreds of millions of people. In spite of their importance, freshwater rivers and streams across the region are inadequately studied and are often highly threatened ecosystems (see section 1.2.3).

In central India, the Chambal river flows through a sanctuary that holds the world's most significant remaining breeding population of the critically endangered gharial, as well as the endangered Ganges river dolphin. Fishing, agriculture, sand mining, water extraction, dams and turtle poaching are threats to these species[39]. In the Sone river, a tributary of the Ganges, endangered species including gharial, narrow-headed softshell turtle and Indian skimmer are threatened by sand mining and the construction of dams and barrages. A thriving local fishing industry is also threatened by the same problems.

Grasslands, scrublands, wetlands and alpine meadows

Myristica swamps are a unique vegetation type in the Western Ghats. They occur in areas below 600 m in altitudes that have medium to high rainfall.[40] At higher altitudes, high-rainfall zones support scrub jungles and savannahs (above 1 700 m) and peat bogs (above 2 000 m). In the Himalayas, the highly productive alluvial grasslands and savannahs along the foothill valleys are among the tallest and most biodiverse grasslands in the world.[41,42] From 4 500 to 4 700 m, the vegetation consists of alpine meadows with a diverse assemblage of numerous alpine herbs. Peri-glacial and sub-nival communities occur in the high alpine areas above 4 700 m, where the short growing season, high winds and unstable soils allow only specialised plants to survive. At between 5 500 to 6 000 m the nival zone, consisting of permanent ice and bare rock, begins.

The Rann of Kutch supports Asia's largest tropical grasslands, the Banni grasslands. These have a long history of nomadic pastoralism and are home to 22 pastoralist communities. In central India, some of the natural grasslands, mostly those along river valleys, have now become agricultural lands, while some other areas are preserved as grassland through human activity, including burning, tree cutting and livestock grazing.

Mangroves

The Sundarbans Mangrove Ecoregion is the world's largest mangrove ecosystem and supports unique and globally threatened species, including Irrawaddy and Gangetic river dolphins, tiger, giant river turtle and Ganges shark. Twenty species of mangrove

(33) http://www.forestpeoples.org/sites/fpp/files/publication/2010/08/resuscitatingsundarbansapr08eng_0.pdf
(34) Globally, eight biogeographic realms form the broadest division of terrestrial ecosystems. The study area covers most of the Indomalaya realm and parts of the Paleartic and Australasian reams. Realms are sub-divided into biomes and ecoregions.
(35) CEPF. Ecosystem Profile for the Western Ghats and Sri Lanka Biodiversity Hotspot.
(36) Ganesh T., R. Ganesan, M.S. Devy, P. Davidar and K.S. Bawa (1996). Assessment of plant biodiversity at a mid-elevation evergreen forest of Kalakkad-Mundanthurai Tiger Reserve, Western Ghats, India. *Current Science* 71(5), pp. 379-392.
(37) Champion H.G. and S.K. Seth (1968). Op. cit..
(38) Molur S., K.G. Smith, B.A. Daniel and W.R.T. Darwall (Compilers) (2011). The Status and Distribution of Freshwater Biodiversity in the Western Ghats, India. IUCN, Cambridge, UK and Gland, Switzerland, and Zoo Outreach Organisation, Coimbatore, India.
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(41) Peet N., A.J. Watkinson, D.J. Bell and B.J. Kattel (1999). Plant diversity in the threatened sub-tropical grasslands of Nepal. Biological Conservation 88, pp.193-206.
(42) Baral H.S. (2001). Community structure and habitat associations of lowland grassland birds in Nepal. University of Amsterdam, Amsterdam, The Netherlands.

The Eastern Himalayan broadleaf and conifer forests of northern India, Nepal and Bhutan are a Global 200 Ecoregion, part of the Himalaya biodiversity hotspot, and are included in three endemic bird areas. Their floral diversity includes many species of flowering rhododendron trees.

tree are found in the Sundarbans, their distribution directly related to the seasonally changing salinity and tidal inundation levels. Mangroves provide feeding and breeding habitat for fish and crustaceans, vital to local food security and livelihoods.

1.2.3 Species diversity, endemicity and extinction risk

As a result of their isolation from other ecologically similar areas, the Western Ghats have a large number of unique species. The highest number of endemics is found in the tropical evergreen forests, especially in areas with a short dry season and at higher altitudes.[43] More than half the tree species found in the montane evergreen forests are endemic, and approximately 63 % of India's woody evergreen taxa are only found in the Western Ghats.[44] The greatest proportion of faunal endemics is found among the amphibians (78 %), followed by reptiles (62 %), fish (53 %), mammals (12 %) and birds (4 %).

The Eastern Himalayas temperate forests are among the most species-rich temperate forests in the world. The drier, south-facing slopes support extensive stands of arboreal rhododendron species that occur together with oak. These temperate forests support a rich epiphytic community. In the drier western Himalayas, in Pakistan, montane conifer forests, consisting of various species of pine, fir, spruce and deodar cedar, begin at about 2 000 m and extend to 4 000 m. Near the treeline, the sub-alpine vegetation is a scrub community of juniper and rhododendron that extends to about 4 500 m. Plant richness in these alpine shrubs and meadows is very high, especially on the shady north-facing slopes that are protected from extreme winter cold by an insulating layer of snow.

The mammalian fauna in the eastern lowlands of the region is typically Indo-Malayan, but further up the mountains it changes to a mix of Himalayan mountain specialists and Palearctic fauna. To the south-west, the arid semi-desert and desert landscapes – a complex of scrubland, sand and gravel plains, and low rocky mountains – are home to a mix of species, some of which have Afro-tropical roots, such as the caracal, sand cat, chinkara gazelle, goitered gazelle, urial and Persian ibex.

The region harbours several species that are endemic or represented by globally significant populations. These include the red panda, golden langur and pygmy hog. The hispid hare is restricted to the alluvial grasslands and the Namdapha flying squirrel to the temperate broadleaf forests of the Eastern Himalayas region, while the giant woolly flying squirrel is only found in the dry pine forests of northern Pakistan. Other species found only within the region include the Manipur bush quail, chestnut-breasted partridge, Blyth's tragopan, Temminck's tragopan, western tragopan, Sclater's monal, Tibetan eared pheasant and rusty-bellied shortwing.

The foothill grasslands and broadleaf forests have important populations of the largest carnivore and herbivores in Asia: the tiger, Asian elephant, greater one-horned rhinoceros and wild water buffalo. The alluvial grasslands, such as the Terai-Duar Savannah and Grassland ecoregion, support some of the highest densities of tiger in the world. The elephant population in the remaining habitat patches along the north bank of the Brahmaputra river in Assam is one of India's largest and most important. The greater one-horned rhinoceros, one of three species found in Asia, is restricted to several small, isolated populations contained within protected areas. Many other refuge populations of large herbivores, for example wild water buffalo, swamp deer (restricted to protected areas in southern Nepal and north-eastern India) also represent some of the last remaining populations in the world, and are considered to be of global significance. The Brahmaputra, Ganges and Indus rivers that flow out of the Himalayan foothills also support globally important populations of the Indus/Ganges dolphin. Although the snow leopard has a wide distribution across the Himalayan range, and into the trans-Himalaya, the populations in the Eastern Himalayas region are important. One of its principal prey species, the markhor, is now largely found in Pakistan. The populations of vulture and greater and lesser adjutant – some of Asia's largest birds – in the foothill grasslands and broadleaf forests are globally significant, as are the populations of several of the hornbill species and pheasants, white-winged duck, white-bellied heron, black-necked stork and the Bengal florican.[45]

The seasonal salt marsh in the Rann of Kutch provides refuge for the last population of the endangered Asiatic wild ass and supports one of the world's largest breeding colonies of the greater and lesser flamingo. In addition, the area supports populations of chinkara, nilgai, wolf, blackbuck, striped hyena, desert cat and caracal. The ecoregion also harbours more than 200 bird species. Although none are endemic, the ecoregion does harbour the globally threatened lesser florican and houbara bustard. The neighbouring Banni grassland is also rich in biodiversity, with Asia's largest congregations of migratory crane, as well as other endangered wildlife.

The drainage area created by the River Chambal in central India, including the National Chambal Sanctuary, is the most important habitat for several globally threatened fauna, such as the gharial, Gangetic river dolphin and the red-crowned roofed turtle. The Chambal is also an important stronghold of the Deccan mahaseer, Putitora mahaseer, narrow-headed soft-shell turtle, three-striped roofed turtle, Indian skimmer, black-bellied tern and sarus crane.[46]

(43) Ramesh B.R., J.P. Pascal, C. Nouguier (1997). Atlas of Endemics of the Western Ghats. Distribution of tree species in the evergreen and semi-evergreen forests. French Institute, Pondicherry.
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#1

Table 1.1 Number of terrestrial and freshwater threatened species, by major taxanomic group and country

Taxanomic group	Bangladesh	Bhutan	India	Nepal	Pakistan	Sri Lanka
Mammals	30	26	88	31	20	26
Bird	33	20	83	36	32	16
Reptiles	23	3	53	9	11	11
Amphibians	1	1	75	3	0	56
Freshwater fish	6	3	160	7	6	11
Invertebrates	0	1	48	3	0	64
Plants	20	18	384	17	12	290
Total	113	72	891	106	81	474

Key: Red list categories: CR: critically endangered; EN: endangered; VU: vulnerable
Source: IUCN Red List, accessed July 2016

Table 1.2 Number of terrestrial and freshwater threatened species, by threat category

Threat category	Bangladesh	Bhutan	India	Nepal	Pakistan	Sri Lanka
Critically endangered	20	10	147	15	12	140
Endangered	37	22	357	34	24	158
Vulnerable	56	40	387	57	45	176
Total	113	72	891	106	81	474

The Eastern Ghats supports high plant species diversity (about 2 600 species of angiosperms, gymnosperms, pteridophytes and 160 cultivated plants are known of, as well as over 530 tree species, and 1 800 medicinal and 450 endemic plant species). However, the forests of the Eastern Ghats are relatively under-studied and have received less attention for conservation compared to the relatively better-known Western Ghats.

Several rare and globally threatened species depend on the Sundarbans, including the river terrapin and Asian white-rumped vulture (both critically endangered); tiger, Ganges river dolphin, fishing cat and masked finfoot (endangered); Pallas's fish eagle, Asian small-clawed otter, Irrawaddy dolphin and olive ridley turtle (all classified as vulnerable). Other important vertebrates include saltwater crocodile and water monitor lizard. More than 170 bird species are known to inhabit these mangrove forests.

A likely new species of 'river shark', deeply divergent from all other lineages in the *Glyphis* genus, was recently discovered off the Sundarbans in the middle of the range of the critically endangered Ganges shark.[47] The range of this species, which may be endemic to Bangladesh, may extend to waterways of the mangrove forest. There is a similar situation with the recent discovery of a genetically distinct population of humpback dolphin (*Sousa* sp.), which also occurs in open estuarine waters off the Sundarbans and occasionally enters inshore channels in the forest.[48] The genetic uniqueness of river sharks and humpback dolphins in Bangladesh has important evolutionary implications due to their isolation, and their survival is threatened in particular by fatal interactions with fisheries.

1.2.4 Geographic priorities for conservation

The exceptional diversity, uniqueness and vulnerability of the region's species and ecosystems are underlined by all the main analyses of global biodiversity priorities. The results of these analyses are reviewed briefly below, and the methodology used to integrate them and derive the geographic priorities for this study is described in section 5.1.

Hotspots: The analysis of global hotspots was developed by Conservation International[49]. It uses criteria combining richness and uniqueness (a hotspot is an area with at least 1 500 species of endemic vascular plants, 0.5 % of the global total) and threat (a hotspot is an area which has lost at least 70 % of its original natural vegetation). There are two hotspots in the region: the Western Ghats hotspot covers a small part of south-western India and all of Sri Lanka, while the Himalayas hotspot covers Nepal, Bhutan, the north-east Indian states of West Bengal, Sikkim, Assam and Arunachal Pradesh, south-east Tibet (Autonomous Region of China), and northern Myanmar, Kumaon-Garhwal, north-west Kashmir and northern Pakistan. For the purposes of this chapter, the part of the hotspot that lies in India, Nepal, Pakistan and Bhutan are considered while the parts that lie in south-east Tibet and northern Myanmar are covered by other regional chapters. A small portion of the Indo-Burma hotspot lies within Bangladesh and north-east India. The Indo-Burma hotspot is considered in the Greater Mekong chapter.

Global 200 (G200) Ecoregions are the regions that are most representative of their biome, within a particular geographic realm[50]. There are 12 terrestrial and 3 freshwater G200 Ecoregions[51] in the South Asia region (Fig. 1.2).

Endemic bird areas (EBAs)[52] are identified by BirdLife International, based on the original breeding ranges of land bird species that have a global distribution of less than 50 000 km². There are 14 EBAs in the region (Fig. 1.3).

To provide an inclusive summary of the results of the global priority setting exercises for the region, the hotspots, G200 Ecoregions and EBAs are combined to identify broad 'priority regions for conservation' in South Asia (Figs 1.2 and 1.3). While this map gives an indication of the most important parts of the region for biodiversity, it is too broad to provide a basis for the development of conservation programmes (the whole of Nepal and Bhutan are included, for example). To overcome this, a more focused landscape-level of analysis, key landscapes for conservation (KLCs), is described in section 5.1.

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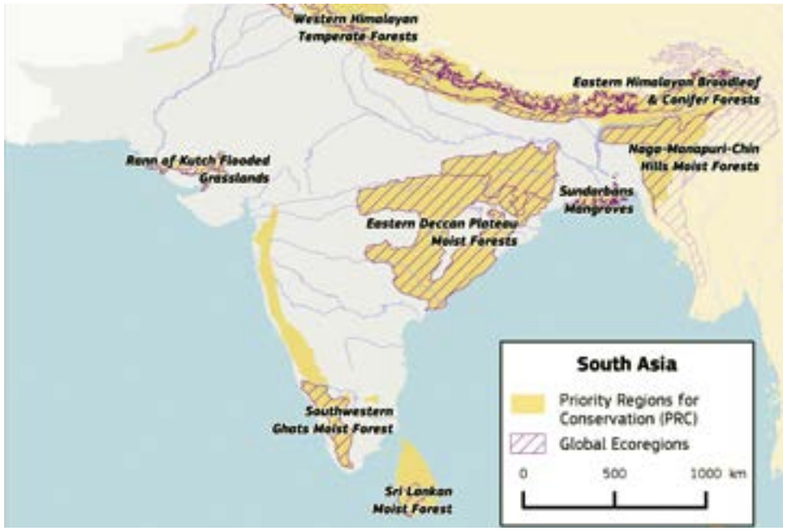
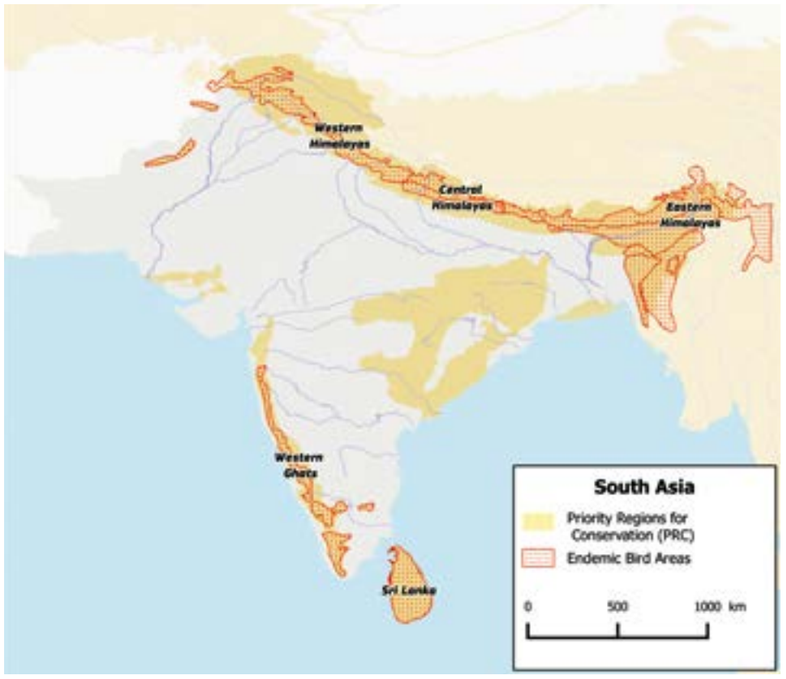
Figure 1.2 Priority regions for conservation and Global 200 Ecoregions in South Asia



Note: Not all G200 Ecoregions are labelled on the map. A full list is in Annex 1.

Figure 1.3 Priority regions for conservation and endemic bird areas in South Asia



Note: Not all EBAs are labelled on the map. A full list is in Annex 1.

2

Conservation challenges

Tiger attacking a sambar deer. South Asia's big cats, tiger, leopard, Asiatic lion and snow leopard, depend on the availability of enough prey. Maintaining large areas of habitat that are rich in prey species is as important as preventing poaching of the cats themselves, and helps to prevent attacks on domestic livestock.

2 _ Conservation challenges

2.1 Key direct threats

2.1.1 Wildlife crime and unsustainable exploitation

Wildlife exploitation and trafficking

The illegal wildlife trade is a growing threat not only to natural resources and species[53] but also to local livelihoods. A wide range of species are targeted, including tiger, snow leopard, leopard, other cat species, pangolins, otters, bears, musk deer, elephant and rhinoceros, as well as many plants. The illegal trade can also promote the emergence and spread of diseases, including zoonotic disease, and invasive species. As part of larger criminal networks, the illegal trade may undermine peace, development and security.[54] The scope and intensity of the threat vary considerably across the region, being highly significant in north-east India, central India, northern Pakistan and Nepal. It is exacerbated by proximity to markets in China, porous borders and inadequate law enforcement.

Wildlife in the region is primarily hunted for food, customary rituals and local trade, and as such plays an important role in the livelihoods of some indigenous and local people. However, commercial hunting and collecting to supply demand from international markets is linked to the serious depletion of wildlife, even within protected areas such as Namdapha National Park in Arunachal Pradesh[55]. Poaching continues to be a significant threat to wild tigers in Bangladesh, India and Nepal, both within and outside protected areas[56,57]: with the official database of the National Tiger Conservation Authority recorded 69 cases of tiger mortality for 2015. This is despite a comprehensive legal system governing wildlife protection, stringent law enforcement within many protected areas and focused measures to conserve important species. There is growing international trade in pangolin scales sourced from India, with traders targeting them across the country[58,59]. Larger and more frequent seizures appear to occur in north-east India with others scattered across the country.[60] Hunting is also reported to be prevalent across the Western Ghats hotspot.[61] In Pakistan, pangolin and freshwater turtles are targeted by poachers and sold on the black market at high prices. In Nepal, poaching remains a significant threat to the greater one-horned rhino, tiger, pangolin[62] and the musk deer. A total of 60 nationally threatened bird species (36 % of the country's nationally threatened species) are affected to some degree by hunting, trapping and associated disturbances[63]. Poaching is a serious threat to tigers and prey in the Sundarbans Reserve Forest in Bangladesh[64]. The intensive and illegal catch of fish fingerlings and shrimp to supply farms around the Sundarbans in Bangladesh has depleted wild populations.

Loss of habitat through biomass extraction, grazing and forest fires

While the patterns and intensity of extraction vary across the hotspot, forest resource extraction has been shown to alter vegetation structure, ultimately leading to forest degradation and loss of biodiversity[65]. Large rural populations have been dependent on the collection of non-timber forest products (NTFP) from protected areas and reserve forests in the Western Ghats, but there is evidence of decreasing pressure in India and Sri Lanka due to factors including urbanisation and the shift towards cultivating cash crops. In Sri Lanka, collection of forest products is reported to have decreased in the decade preceding 2017, with the exception of areca nut collection.[66] Conversely, rising commercial demand, pressure from outside harvesters, loss of tree tenure and changes in livelihood strategies, are all leading to more intense extraction of commercially valuable species such as black damar, a species heavily harvested for its resin[67]. Commercial harvesting of plant species from reserved forests and (illegally) from protected areas is unregulated, making it vulnerable to unsustainable use. Deforestation has become acute in Pakistan, with the rate of deforestation increasing as the demand for wood far exceeds the current level of sustainable supply. As a result, the country only has about 4 % of its natural forest remaining, mostly in the mountainous north. In Nepal, unregulated grazing in forests by the livestock of small farmers (in the Siwaliks) or nomadic herders (in the high mountains) is a widespread practice that inhibits regeneration and growth of seedlings, and ultimately causes forest degradation. Uncontrolled and recurrent forest fires severely damage regeneration, destroy non-timber forest products and, in some cases, encourage invasive species. Large-scale timber extraction from the Sundarbans of Bangladesh was banned in 1989, but firewood collection and small-scale logging continue.

2.1.2 Land-use change

Deforestation and the loss of important habitats through conversion and degradation is a common threat in the South Asia region. Forest encroachment and clearing resulted in tiger habitat loss in the Namdapha Royal Manas transboundary landscape (Bhutan, India, Nepal) as well as within important corridor areas linking core tiger reserves within the Terai Arc landscape in Nepal. The problem is not confined to unprotected landscapes: the protected areas designated as source populations of tigers lost approximately 1 677 km² of forests between 2001 and 2014, with 91 % of the loss occurring within 10 protected areas.[68]

Biodiversity impacts of infrastructure development and urbanisation

The density of linear infrastructure in the form of roads and power transmission lines is increasing within and outside protected areas. Power lines are often established along lengthy linear clearings, resulting in direct habitat destruction, internal fragmentation and degradation of habitats, and electrocution of wildlife.[69] The Elephant Task Force in India recommends addressing elephant deaths due to electrocution by power lines.[70] In the Western Ghats, major roads including national and state highways and Public Works Department roads cut through 26 of the 42 PAs declared as tiger reserves.[71] The situation is similar in Sri Lanka, with demand for land driven by government-initiated improvements to the country's infrastructure.[72] The increase in linear infrastructure is a major challenge for wildlife management and conservation in India, with mitigation of the impact of roads on large wildlife particularly difficult.

The Himalayan region has witnessed the widespread growth of human settlements and accompanying infrastructure. Small villages have been transformed into large towns and towns into major cities. The expansion of road networks is also driven by strategic considerations, such as military operations, mining and hydropower. Improved roads facilitate increased immigration

Gun trap set by hunters. Wildlife is hunted in reprisal for damage to crops and livestock, for food and to supply the illegal wildlife trade.

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(67) Varghese A. and T. Ticktin (2008). Regional variation in non-timber forest product harvest strategies, trade, and ecological impacts: the case of black dammar (Canarium strictum roxb.) use and conservation in the Nilgiri Biosphere Reserve, India. Ecology and Society 13(2), pp. 11. Available at http://www.ecologyandsociety.org/vol13/iss2/art11/
(68) Joshi A. R., E. Dinerstein, E. Wikramanayake, M.L. Anderson, D. Olson, B.S. Jones, J. Seidensticker, S. Lumpkin, M.C. Hansen, N.C. Sizer, C.L. Davis, S. Palminteri and N.R. Hanh (2016). Tracking changes and preventing loss in critical tiger habitat. Sci. Adv. 2016; 2, e1501675.
(69) Sundar G. and B.C. Choudhary (2005). Mortality of sarus cranes (Grus antigone) due to electricity wires in Uttar Pradesh, India. Environmental Conservation, 32, pp. 260-269.
(70) Ministry of Environment and Forests, India (2010). Report of the Elephant Task Force. Securing the Future of Elephants in India.
(71) Wildlife Institute of India (2015). Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife. (Draft for comment). See http://www.moef.nic.in/sites/default/files/Inviting%20commnets%20%26%20suggestions.pdf
(72) UN REDD Programme (2015). Drivers of Deforestation and Forest Degradation in Sri Lanka.

Road building in the Himalayas. Improving infrastructure connects remote rural communities to modern facilities and brings economic opportunities. However, it can also accelerate the exploitation of natural resources to unsustainable levels, and facilitate land conversion.

and tourism in the region. The road network in Bhutan increased by 43 % between 2001 and 2010.[73] In Nepal, the Department of Roads estimates that around 25 000 km of rural road tracks had been opened by 2010, most of which were constructed without any environmental safeguards.[74] Planned conversion of forestland by the government for implementing economic development priority projects, such as the construction of roads, electric transmission lines and reservoirs, is a major cause of habitat loss and degradation in some places. In the Chitwan Annapurna Landscape in Nepal, unplanned and extensive construction of rural roads by Village Development Committees and District Development Committees is a major direct cause of deforestation and forest degradation in the mid hill districts.

The China-Pakistan Economic Corridor is expected to extend from south-western Pakistan to China's north-western autonomous region of Xinjiang, via a vast network of highways and railways. This collection of projects has been estimated to cost almost EUR 50 billion, mostly financed by loans from Chinese banks. Among the projects are a 1 100-kilometer road between Karachi and Lahore, and significant reconstruction of the Karakoram Highway, which cuts across much of the middle Indus valley through the mountains of Gilgit-Baltistan up to China. Major additions to the country's railway network and natural gas and oil pipelines are also expected to be constructed. A number of concerns have been raised about the pace and planning of these projects, including fears of environmental damage, both directly from the construction activities and indirectly from fragmentation of habitat and limitations on wildlife movements due to the resulting linear infrastructure.

Biodiversity impacts of mining

Increasing need for energy and continued reliance on coal-fired thermal power generation is a major driver of coal mining. It has consumed large swathes of biologically rich forests in the central Indian region[75], and threatens a further 1.1 million hectares of forest in 13 coalfields. Almost all the coalfields overlap with the habitat of threatened species. Power plants also pose a threat of air and water pollution. A planned 1 320 megawatt coal-fired power plant at Rampal, which will be Bangladesh's largest, will be located within the designated ecologically critical area just 14 km from the Sundarbans Reserved Forest. This and other developments in the region are expected to negatively impact the Sundarbans ecosystem through increases in vessel traffic, pollution and human settlements.[76]

Parts of the Western Ghats are rich in iron, manganese and bauxite ores. A steep increase in iron ore prices and demand for lower grade ores has led to a rapid growth of mining activities. Often these activities are in violation of environmental laws, and result in serious environmental damage and social disruption.[77] To meet the growing demands for construction materials, there has also been an increase in quarrying for granite, limestone and other types of stone, as well as sand mining in riverine habitats.

(73) Pandit M.K., M. Kumar and L.P. Koh (2014). Dancing on the Roof of the World: Ecological Transformation of the Himalayan Landscape. See https://bioscience.oxfordjournals.org/content/early/2014/09/16/biosci.biu152.full.pdf; Bhutan-National Biodiversity Strategy and Action Plan (2010), page 26.
(74) http://www.worldhighways.com/sections/key-projects/features/nepal-plans-road-infrastructure-expansion/
(75) Fernandes A. (2012). How coal mining is trashing India's Tigerland. Greenpeace India. See www.greenpeace.org/India
(76) https://www.washingtonpost.com/news/energy-environment/wp/2016/07/18/a-new-power-plant-could-devastate-the-worlds-largest-mangrove-forest/?utm_term=.936e6af847fb
(77) Western Ghats Ecology Experts Panel (2011). Report submitted to the Ministry of Environment and Forests, Government of India.

In the Himalayan region, open cast mining and oil exploration are major threats in north-eastern states of India and in Pakistan[78]. Sand and stone mining for construction are localised drivers of deforestation in many areas in Nepal.

2.1.3 Hydropower development and large-scale diversion of water flows

Hydropower and water-transfer schemes alter the natural cycle of flooding that replenishes fertile soils on flood plains and supplies water to temporal wetlands. In some cases, it affects river estuaries many hundreds of kilometres from the dam. Unseasonal releases from dams disrupt the breeding of species that use sandbanks and riparian habitats along the river channel. Spatial and temporal uncertainty and variability in monsoons, intensified by climate change, compounds the negative impacts. Dam structures also interrupt the migration of fish and cause inundation of large areas upstream.[79]

Across India, from small headwater streams in forested mountains to large rivers, projects for hydropower generation, abstraction of water for industry, towns and cities, and even large-scale inter-basin water diversions are either ongoing or planned. Dam construction in the Himalayas over the next 20 years is likely to result in one of the highest average dam densities in the world, with one dam for every 32 km of river channel.[80] The Siang river and its tributaries in Arunachal Pradesh, flowing through some of the most ecologically intact habitat in the area, are threatened by 44 planned hydropower projects.[81] Similarly, Nepal is opening up its vast hydropower potential to help ease chronic power shortages and stimulate economic growth.[82]

In India, the National River Linking Project is one of numerous inter-basin transfer projects that have been proposed by state and central governments to divert 'surplus' water from the west-flowing rivers to the water-stressed basins of east-flowing rivers to meet drinking water, irrigation and energy demands.[83] Among the schemes proposed, the Ken-Betwa river linking project is expected to submerge a portion of the Panna Tiger Reserve in Madhya Pradesh.

Impacts on biodiversity are not always direct. In Pakistan, the proposed Diamer Bhasha Dam in Gilgit-Baltistan would flood a significant stretch of the upper Indus valley and displace an estimated 30 000 people, with severe impacts expected on surrounding highland ecosystems and existing community conservation initiatives, which are protecting forests and markhor, urial, snow leopard and other wildlife.

At a local level, failure to adequately take into account environmental impacts of dams can have severe consequences. Small hydropower projects (often categorised as 'green energy') entail diversion of water through pipes and canals, resulting in drying sections of streams. The Karnataka Elephant Task Force in the Western Ghats has expressed concern that the increasing number of mini-hydro projects within elephant habitat will make some areas unsuitable for elephant, reducing connectivity and perhaps increasing conflicts with people. Similar disruption can be caused by poorly-sited solar and wind energy projects. Indian national water policy stipulates that ecological and environmental flows should be maintained in rivers, but the absence of rigorous scientific guidelines for assessing flow regimes poses serious challenges to implementing the policy.

Water management has important international dimensions. Bangladesh has been strongly impacted by upstream water development projects in India, where almost all its waterways originate. Reduced flow below the Farakka Barrage, on the main stem of the Ganges on the Indian side of the border, is causing major salinity intrusion and sedimentation in the Sundarbans.

2.1.4 Expansion of agriculture and aquaculture, and grassland conversion

Land-use change analysis in the Western Ghats indicates a reduction in forest area[84] and an increase in the area under commercial plantations of eucalyptus, coffee, tea, cardamom, rubber, cocoa, areca nut, coconut and, increasingly, oil palm. Plantation landscapes occur as enclaves within protected areas. This increases the chance of contact between wide-ranging wildlife, such as Asian elephant and leopard, and people and crops.[85] In Sri Lanka, encroachment into forested areas is driven by commercial rain-fed agriculture (tea, rubber, cinnamon and

(78) Goswami S. and R. Goswami (2015). Coal Mining vis-à-vis Agriculture in India: A Question of Sustainability. EnvironmentAsia 8(1), pp. 24-33. Available online at www.tshe.org
(79) Krishnaswamy, J. (2015). Saving India's Rivers and Riverine Ecosystems. Fundamatics. http://www.fundamatics.net/article/saving-indias-rivers-and-riverine-ecosystems/, accessed 12 July 2017
(80) Pandit M.K. and R.E. Grumbine (2012). Potential effects of ongoing and proposed hydropower development on terrestrial biological diversity in the Indian Himalaya. Conservation Biology 26, pp. 1061-1071. DOI: 10.1111/j.1523-1739.2012.01918
(81) Dandekar P. and H. Thakkar (2014). Cumulative impact assessment study of Siang basin in Arunachal Pradesh: serious shortcomings; pro large hydro bias. http://sandrp.wordpress.com/2014/02/18/cumulative-impact-assessment-study-of-siang-basin-in-arunachal-needs-urgent-improvement/. Also Teegalapalli K. (2015). See http://www.downtoearth.org.in/blog/damn-that-river-46853
(82) http://www.reuters.com/article/nepal-hydropower-china-idUSL4N0XA4EN20150413
(83) http://www.teriin.org/pdf/TG_Nov2013.pdf
(84) Reddy C.S., K. Dutta and C.S. Jha (2012). Analysing the gross and net deforestation rates in India. Current Science 105, pp. 1492-1500.
(85) Mudappa D., T.R. Shankar Raman, M.A. Kumar (2014). Restoring nature: Wildlife conservation in landscapes fragmented by plantation crops in India. In: Rangarajan, M., M.D.M. Madhusudhan and G. Shahabuddin (Eds.). Nature Without Borders, pp. 178-214.

cardamom) in the highlands, smallholder plantations in the lowland wet zone, and maize cultivation. In certain areas, large, private agriculture ventures for sugar cane, cashew and banana[86] are responsible for significant deforestation.

In north-east India approximately 30 % of the total forest cover is under pressure, while virtually all of the remaining forests in Pakistan are threatened. In India, the states of Meghalaya, Nagaland and Tripura show the greatest loss of forest cover. Shifting cultivation or *Jhum*, a diversified cropping system that causes only temporary loss of small forest patches followed by forest recovery, is a widespread land-use practice in north-east India. However, increasing human population and lack of livelihood options or a clear land tenure policy have undermined the sustainability of this traditional system. A new land-use policy is now associated with an increase in monoculture of oil palm, rubber and horticultural plantations such as pineapple, causing permanent deforestation[87]. In the Bhumthang region of Bhutan, traditional, locally developed sustainable agricultural practices and associated agrobiodiversity (i.e. *pangshing*) are being replaced with intensive, petrochemically dependent, export cash crops such as potatoes.[88] In Nepal, forests in the Chitwan Annapurna Landscape are being degraded and lost as a result of spiralling demands for agricultural land and the unsustainable exploitation of forest products (fuelwood, construction timber, fodder).[89]

The conversion of savannah grasslands to monoculture tree plantations, many of them with exotic *Glyricidia* and eucalyptus species, has significant ecological and social impacts. This practice is encouraged when State Forest Departments perceive grassland habitats to be degraded wastelands. In the semi-arid savannahs of peninsular India, these activities threaten the agro-pastoralist communities and critically endangered species such as the great Indian bustard and lesser florican. Endangered and endemic species such as the blackbuck antelope and the Indian sub-species of the wolf are also threatened. Large parts of the Banni grassland ecosystem in the Rann of Kutch have been converted to carbon-sequestering forests, wind and solar farms, or industrial estates.[90] Furthermore, an introduced nitrogen-fixing tree, *Prosopis juliflora*, has replaced native trees and grasslands, altered habitat for birds and animals, and reduced grazing areas for livestock.

Similarly, in Sri Lanka, the savannah woodlands of Nilgala (rich in medicinal plant species) are being reduced, while the damana grasslands of Ampara have been converted to establish human settlements.[91]

2.1.5 Human-wildlife conflict

The protected area systems in South Asia lie within a matrix of some of the most densely populated human enclaves and agricultural landscapes in the world. As a result, the level of human-wildlife conflict has escalated across the region, resulting in the deaths of livestock, people and wildlife, as well as crop damage.

In the Western Ghats, leopard, tiger, striped hyena and elephant come into contact with people when they use land outside protected areas. In Sri Lanka, the influx of people into elephant habitat results in the deaths of over 70 people and 200 elephants a year.[92] In north-east India, human-elephant conflict and crop depredation by wild pigs and primates are significant[93]. Human-wildlife conflict has increased in Bhutan, where free-roaming livestock is taken by leopard, tiger, bear, wild dog and snow leopard.[94] Furthermore, loss of crops to wild pig and sambar deer has led to retaliatory killings of wildlife.[95] In the high mountains across the region, particularly in Pakistan, human-snow leopard conflict is prevalent due to predation on livestock. Elsewhere in Pakistan, lack of prey and loss of habitat has brought leopards into contact with livestock and people. Conflict-driven killing of tiger and tiger prey species in the Sundarbans has a long history and continues to be a threat.[96,97]

2.1.6 Invasive species

Invasive plants compete with native species, changing the vegetation structure and affecting food supplies and habitat quality, with concomitant effects on the ecosystem. They are an increasing problem in protected areas throughout the region. Their spread is frequently associated with human pressure on natural habitats, including the opening of forest canopies and changes in natural burning or flooding regimes. The creeping plant *Lantana camara* is currently the most widespread invasive species in the Western Ghats and there is growing evidence to suggest that its presence is correlated with the reduced abundance of native species. There are more than 10 species of invasive plants and 12 species of invasive flora spreading through the wetlands of Sri Lanka.[98]

In the Eastern Himalayas, invasive plant species are rapidly spreading in the forest ecosystems of the Siwaliks and mid-hills in Nepal, with catastrophic effects on native vegetation and wildlife in some areas. Invasive plant species *Mikania micrantha, Lantana camara* and *Eupatorium adeophorum* are particularly widespread in Chitwan National Park and the surrounding forests. Wetlands in Nepal are also under pressure, including by the common water hyacinth.

2.1.7 Threats to freshwater ecosystems

In the Western Ghats, *Myristica* trees, the most primitive of the flowering plants on earth, are abundant in the ancient tropical freshwater swamp forests. These swamps previously occupied large swathes, but are now restricted to less than 2 km^2. Many patches have been converted to paddy fields, areca nut plantations or settlements, and others submerged for irrigation projects. In Sri Lanka, wetlands have deteriorated as a result of siltation due to poor land use in adjacent areas, drainage, clearing of wetland vegetation and water pollution (with agrochemicals, industrial waste, sewage and solid waste).

Biological resource use in the form of fishing and harvesting of aquatic resources is identified as impacting over 30 % of all threatened freshwater species in the Eastern Himalayas. Pollution from agricultural sources threatens almost 26 % of threatened species, while sedimentation, residential and commercial development, and dams and deforestation all impact at least 10 % of threatened species.[99] Pollution, overharvesting of resources and overgrazing were identified as some of the threats impacting the high-altitude wetland ecosystems in Bhutan[100], but addressing the threats to wetlands is hampered by a lack of baseline data on species' distributions and ecological requirements.[101]

In India and Pakistan, the overexploitation of fish stocks has resulted in fewer large fish. The shift to smaller fish has probably intensified competition between people and freshwater Indus/Ganges river dolphins.[102] The increasing number of dams and barrages has also led to a dramatic decrease in available habitat, and resulted in fragmented and isolated sub-populations.

2.1.8 Greenhouse gases and climate change

Bangladesh and India are among the 32 'extreme risk' countries identified worldwide as most vulnerable to climate change, with Bangladesh considered at highest risk.[103] A combination of climate change vulnerability and food insecurity amplifies the risks of conflict and civil unrest. In addition to the multidimensional ways in which climate change will directly affect species and ecosystems, the impacts on human communities will indirectly influence biodiversity as people are forced to move and change land-use practices. In Bangladesh, projected changes in river flows and freshwater availability pose a significant risk to large human populations as well as placing additional pressure on biodiversity and natural ecosystems in the Sundarbans area.[104]

Climate change is expected to have significant implications for biodiversity and human communities in the Himalayan region.[105] Increasing temperatures associated with climate change in tropical mountains are influencing vegetation in multiple ways. The continued warming is likely to result in reductions of the habitat available for mountain species, leading to species extinctions, particularly in high altitude regions within the Himalayas.[106]

Of the countries in South Asia, India has by far the highest total greenhouse gas (GHG) emissions, including the highest from land-use change and forestry (Table 2.1). Pakistan is the second highest in overall GHG emissions, but Bangladesh has a slightly higher level of land-use change and forestry emissions. Only Bhutan has negative emissions (i.e. sequestration of carbon exceeds emissions).

(86) UN REDD Programme. (2015). Drivers of Deforestation and Forest Degradation in Sri Lanka.
(87) Shankar Raman. See http://coyot.es/elephanthills/
(88) Wangchuk S. and S.F.S. Siebert (2013). Agricultural Change in Bumthang, Bhutan: Market Opportunities, Government Policies, and Climate Change. Society & Natural Resources 26(12), pp. 1375-1389. DOI: 10.1080/08941920.2013.789575
(89) World Wildlife Fund (2013). Chitwan-Annapurna Landscape Drivers of Deforestation and Forest Degradation. Hariyo Ban Program, WWF Nepal.
(90) http://sites.nationalacademies.org/PGA/PEER/PEERscience/PGA_168070
(91) Sri Lanka National Biodiversity Strategy and Action Plan (2014). See https://www.cbd.int/doc/world/lk/lk-nr-05-en.pdf
(92) Fernando P., P. Leimgruber, T. Prasad and J. Pastorini (2012). Problem-Elephant Translocation: Translocating the Problem and the Elephant? PLoS 7(12), e50917. See http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0050917
(93) Mishra C., M.D.M. Madhusudhan and A. Datta (2006). Mammals of the high altitudes of western Arunachal Pradesh, eastern Himalaya: an assessment of threats and conservation needs. Oryx 40, pp. 1-7.
(94) Royal Government of Bhutan (2013). Assessment on Impact of Human-Wildlife Conflict Management Intervention to the local communities.
(95) Katel O.M., S. Pradhan and D. Schmidt-Vogt (2014). A survey of livestock losses caused by Asiatic wild dogs, leopards and tigers, and of the impact of predation on the livelihood of farmers in Bhutan Wildlife Research. See http://dx.doi.org/10.1071/WR14013
(96) Chakraborthy R. (2010). Prioritizing the tiger: A history of human-tiger conflict in the Sundarbans. Current Conservation, 4, pp. 44-47.
(97) Barlow A., I. Ahmad and J. Smith (2013). Profiling tigers (Panthera tigris) to formulate management responses to human-killing in the Sundarbans. Wildlife Biology in Practice, 9, pp. 30-39. DOI: 10.2461/wbp.2013.9.6.

(98) Sri Lanka's Fifth National Report on the Convention of Biological Diversity (2014). Biodiversity Secretariat, Ministry of Environment & Renewable Energy, Government of Sri Lanka.
(99) Allen D.J., S. Molur and B.A. Daniel (Compilers) (2010). The Status and Distribution of Freshwater Biodiversity in the Eastern Himalaya.
(100) Wangdi N. and Sherub (2013). Ecological and Socio-cultural Significance of High Altitude Wetlands – A case study of Nub Tshonapatra, Tshokar-Tshona, Tampe Tsho and Jigme Langtsho in Bhutan. Ugyen Wangchuck Institute for Conservation and Environment, Department of Forests and Park Services. UWICE Press.
(101) Molur S., K.G. Smith, B.A. Daniel and W.R.T. Darwall (Compilers) 2011. The Status and Distribution of Freshwater Biodiversity in the Western Ghats, India. IUCN, Cambridge, UK and Gland, Switzerland, and Zoo Outreach Organisation, Coimbatore, India.
(102) Dudgeon D. (2005). River rehabilitation for conservation of freshwater biodiversity in monsoonal Asia. Ecology and Society 10, p. 15. See http://www.ecologyandsociety.org/vol10/iss2/art15/
(103) https://maplecroft.com/portfolio/new-analysis/2014/10/29/climate-change-and-lack-food-security-multiply-risks-conflict-and-civil-unrest-32-countries-maplecroft/
(104) USAID Bangladesh country profile.
(105) Sharma E., N. Chettri, K., Tse-ring, A.B. Shrestha, M.P. Fang Jing and M. Eriksson, M. (2009). Climate change impacts and vulnerability in the Eastern Himalayas. ICIMOD, Kathmandu.
(106) Telwala Y., B.W. Brook, K. Manish and M.K. Pandit (2013). Climate-Induced Elevational Range Shifts and Increase in Plant Species Richness in a Himalayan Biodiversity Epicentre. PLoS ONE 8(2), e57103. DOI: 10.1371/journal.pone.0057103

Table 2.1 Greenhouse gas emissions

Country	Total net GHG emissions 2013 (all sources) ($MtCO_2e$)	Net GHG emissions from land-use change and forestry 2013 ($MtCO_2e$)	Net GHG emissions 2013 (tCO_2e per capita)
Bangladesh	192.71	29.08	1.23
Bhutan	-2.35	-3.81	-3.11
India	3 031.34	122.29	2.37
Nepal	42.30	6.27	1.52
Pakistan	355.37	28.60	1.96
Sri Lanka	42.83	4.45	2.08

Source: World Resources Institute.[107]

2.2 Drivers of threats

A burgeoning human population and associated demands on land and natural resources places enormous pressures on biodiversity and protected areas in the South Asia region. The human footprint[108] is increasing at an unprecedented rate.

2.2.1 Unsustainable economic development and inefficient resource management

The countries of the region are all committed to economic development as the primary means to deliver greater wealth and improved public services to their growing populations. Rapid economic development is the main driver of infrastructure expansion that directly impacts protected areas and wildlife habitat. In India, the availability of increased capital and a push towards faster clearance of infrastructure and development projects suggest that there will be major challenges in reconciling economic expansion with the conservation of natural systems.[109] The emphasis on economic development and associated investments in infrastructure are not matched by corresponding efforts to strengthen and empower institutions mandated with law enforcement for wildlife and protected area management.

At the same time, markets outside the region are also growing, with economic growth and increasing spending power across East and South-East Asia creating an increasing demand for wildlife products. When these products are from rare and protected species, this market demand is supplied by transnational criminal networks, attracted by the relatively low risks and high potential profits from the trade.

In Nepal, the drive toward economic development coupled with weak enforcement of forest law has led to unplanned and unregulated construction of infrastructure inside forestlands. The existing regulatory mechanisms are unable to address rampant violations. Weak law enforcement and regulatory mechanisms and overall poor governance of the forestry sector are major factors underlying deforestation and forest degradation in the Chitwan Annapurna Landscape.

2.2.2 Weak environmental governance

A range of factors such as political influence, social exclusion, corruption and weak administrative capacity have contributed to weak environmental regulation and non-compliance in many parts of the region. Environmental and social impact assessments are weak and ineffective. Ecological assessments are scarcely implemented and in the rare cases when they are, they often miss crucial aspects such as the habitat of threatened or culturally significant wildlife (e.g. the presence of endangered black-necked crane in the submergence zone of Nyamjang Chhu hydroelectric project, Arunachal Pradesh), or produce recommendations that are ignored[110].

Across the region, multiple agendas and a lack of coordination and collaboration among relevant ministries and departments often prevent effective policy implementation. In India, the implementation of Ecologically Sensitive Zones or Areas[112], which are 10 km zones around protected areas where development should be limited, has been difficult because of the complex network of stakeholders involved.

Weaknesses in governance may also stem from lack of capacity, within governments as well as the private sector, to implement policies on sustainable land use, such as water and soil conservation, or best practice in agrochemical use.

Corruption is an important element of poor governance, as it undermines accountable and evidence-based decision-making. Table 2.1 shows that corruption is perceived to be highest in Bangladesh, and lowest in Bhutan.

Table 2.2 Corruption Perceptions Index scores, 2016

Country	Corruption perception score 2016 0: very corrupt; 100: very clean	Ranking of countries 2016 1: least corrupt; 168: most corrupt
Bangladesh	26	145
Bhutan	65	27
India	40	79
Nepal	29	131
Pakistan	32	116
Sri Lanka	36	95

Source: Transparency International Corruption Perceptions Index, 2016.[111]

2.2.3 Conflict over land and resource rights

Conflict over land and resource rights results from complex and unclear land tenure, and is a major driver of illegal forest conversions and overexploitation of resources across the region. In Pakistan and Bangladesh, land rights are insecure in large measure because of an inefficient, expensive and corruption-prone system of land titling and registration[113]. In India, the Forest Rights Act (2006)[114] recognised customary rights for forest dwelling groups, but implementation has had mixed results, with a few successes over-shadowed by many failures.[115]

In Nepal, blurred tenure and forest-use rights have contributed to perceived open access and degradation of government-managed forests. Where community rights are recognised, they often require support from government institutions to ensure that they can be exercised without interference from other parties.

2.2.4 Civil unrest, insurgency and political instability in transboundary regions

Civil unrest and insurgency are important factors influencing protected area management and law enforcement, particularly in transboundary regions. Violent conflict and civil unrest are particularly severe in Pakistan, threatening both government and community-based management of natural resources. In the Himalayas, both national parks within the India-Bhutan Transboundary Manas Conservation Complex are affected by ethnic and political disturbance with grave security and conservation implications. The decade-long ethnic strife of the Bodo indigenous community and Indian rebel insurgent groups affect park staff, infrastructure, wildlife and habitat, seriously hampering effective management at both sites. Civil unrest and insurgency, associated with political instability in Assam, and an unchecked influx of refugees from Bangladesh have been directly linked to greater one-horned rhino poaching in the Kaziranga and Manas National Parks.[116] Similarly, insurgency is linked with deforestation in north-east India and along the border between Pakistan and Afghanistan.

(107) CAIT Climate Data Explorer (2015). World Resources Institute, Washington, DC. Available online at: http://cait.wri.org, accessed 3 May 2017.
(108) http://www.worldwildlife.org/threats/the-human-footprint; The human footprint is measured as: (a) carbon emissions, (b) the amount of cropland used to grow plants for food, fibre, animal feed and commodities including oil, soy and rubber, (c) the amount of grazing land used to raise livestock for meat, dairy products, hide and wool, (d) the extent of forests required to supply timber, pulp and fuel wood, (e) primary production required to support the fish and seafood caught in freshwater and marine environments, and (f) the amount of land covered by human structures, including transportation, housing, industrial structures and reservoirs created by dams.
(109) Mohan V. (2014). Javadekar for Faster Clearance to Infrastructure Projects, Times of India, 30 May.
(110) Raman T.R.S and M.D.M. Madhusudhan (2015). Current ecological concerns in the power sector: Options to avoid or minimise impacts. Socioecological Narratives. Available at http://www.ippai.org/articles/current-ecological-concerns-in-the-power-sector-options-to-avoid-or-minimise-impacts
(111) http://www.transparency.org/news/feature/corruption_perceptions_index_2016#table, accessed 28 April 2017.
(112) These zones promoted an approach to prohibit the most damaging and high impact activities in the most ecologically sensitive zones and simultaneously create an enabling process to incentivise environmentally sound development that benefits local livelihoods and economies.
(113) USAID Country Profile for Bangladesh.
(114) The landmark legislation laid the foundation for more democratic forest governance through recognition of individual and community forest and resource rights. It entitles individuals, families or communities to rights over land and forest and, importantly, empowers the Gram Sabha, or village assembly, with initiating the process of claims and recognition of rights.
(115) Oxfam India Policy Brief (2015). Implementing the Forest Rights Act: Lack of political will?
(116) Lopes A. (2014). Civil unrest and the poaching of rhinos in the Kaziranga National Park, India. Ecological Economics 103, pp. 20-28.

3

Ongoing conservation efforts

Blue peafowl originate from South Asia, although they are now kept in collections worldwide. They are protected culturally and, in some jurisdictions, by law. They are relatively common in open woodlands and grasslands throughout the region.

3 _ Ongoing conservation efforts

3.1 Government

3.1.1 Institutions for conservation

All countries in the region have government institutions mandated to manage protected areas and enforce conservation legislation. Table 3.1 lists the institutions with primary responsibility for biodiversity conservation-related issues in the region.

Table 3.1 Summary of the division of responsibility for conservation between government agencies

Country/agency	Mandate
Bangladesh	
Ministry of Environment and Forests	Policy guidance on biodiversity conservation and management. Cross-sectoral coordination and integration. Progress review of enforcement of regulations concerning biodiversity conservation. Developing and implementing the National Biodiversity Strategy and Action Plans (NBSAPs).
Bangladesh Forest Department	Management of forest reserves, wildlife and protected areas.
Department of Environment	Dealing primarily with 'brown' and 'grey' issues and management of ecologically critical areas in the environment sector.
Ministry of Agriculture	Overall policy development, guidance provision and implementation of biodiversity-related activities and formulation of regulatory mechanisms relevant to biodiversity conservation in the agricultural sector. Coordinating and ensuring the implementation of biodiversity-related activities under the NBSAP by its departments and research organisations
Ministry of Fisheries and Livestock	Overall policy development, guidance and implementation of biodiversity-related activities and formulation, and application of regulatory mechanisms in fishery and livestock sectors. Coordination of and ensuring the implementation of biodiversity-related activities under the NBSAP by its departments and research organisations, as appropriate.
Ministry of Science and Information and Communication Technology	Promoting scientific research in biodiversity assessment, particularly for microorganisms. Strengthening scientific capacity building. Coordinating and ensuring the implementation of biodiversity-related activities under the NBSAP by its departments and research organisations, as appropriate.
Ministry of Local Government, Rural Development and Cooperatives	Involving local government bodies and local stakeholders in biodiversity conservation. Integrating biodiversity conservation mechanisms in local-level planning. Developing capacities of local-level institutes for biodiversity conservation.
Ministry of Water Resources	Overall policy development, guidance provision and implementation of biodiversity-related activities and putting appropriate regulatory mechanisms in place in the water sector. Strengthening the capacities of the Bangladesh Wetland and Haor Development Board in implementing the wetland ecosystem management approach.
Ministry of Chittagong Hill Tracts Affairs	Overall policy development, guidance and implementation of biodiversity-related activities and regulatory mechanisms for restoration and management of hill ecosystems. Documentation of traditional knowledge of the upland communities. Promoting restoration and management of community reserves.
Ministry of Civil Aviation & Tourism	Promoting eco-tourism through community involvement. Establishing and implementing regulations relating to tourism. Building capacity for the local tour operators.
Ministry of Education	Integrating biodiversity into both formal and informal education curricula. Building teachers' capacity through 'train the trainer'. Reaching students for nationwide biodiversity conservation campaign.
Ministry of NGO Affairs	Overseeing and coordinating biodiversity conservation activities. Creating mass awareness. Creating and developing alternative livelihood options for biodiversity user groups.
Ministry of Energy and Mineral Resources	Ensuring environmental impact assessments and continuous biodiversity monitoring and assessment during any mining/quarrying activities.

Table 3.1 (continued)

Country/agency	Mandate
Bhutan	
Ministry of Agriculture and Forests (MoAF)	Central organisation for the formulation and implementation of policies and legal frameworks related to biodiversity, forests, livestock and agriculture.
National Biodiversity Centre of MoAF	Mandated to coordinate the implementation of biodiversity conservation and sustainable utilisation programmes in the country, and specifically the objectives of the Convention on Biological Diversity (CBD). Implements the programmes of work for thematic areas and cross-cutting issues.
Department of Forests and Park Services of MoAF	The overall authority for the management of forest resources and wild biodiversity. Responsible for *in situ* conservation of wild biodiversity through the creation and management of a protected area system; protection and management of forest and wildlife resources; education and public awareness.
Department of Agriculture of MoAF	To enhance food security and income through improved management of field crops, horticultural crops and medicinal plants.
Department of Livestock of MoAF	Responsible for coordination, administration and management of services related to livestock production, livestock input supply and livestock health. It works towards attaining food security and self-sufficiency in livestock products by ensuring prompt delivery of appropriate technologies and services.
National Environment Commission (NEC)	An independent authority and the highest decision-making body on all matters related to the environment and its management in the country. It has a secretariat responsible for implementing the policies, regulations and directives issued by the National Environment Commission.
India	
Ministry of Environment, Forest and Climate Change (MoEF), (including the National Tiger Conservation Authority)	Responsible for the planning, promotion, coordination, oversight and implementation of policies and programmes relating to the conservation of the country's natural resources, including its lakes and rivers, its biodiversity, forests and wildlife, ensuring the welfare of animals, and the prevention and abatement of pollution.
Directorate of Wildlife Preservation of MoEF	Oversees all matters concerning wildlife, including wildlife-related crimes. Deals with policy and law matters and knowledge management for facilitating processes and analysis for the evolution of policy and law for the conservation of biodiversity and protected areas network.
Wildlife Crime Control Bureau	Combatting organised wildlife crime.
Ministry of Agriculture and Farmers Welfare	The apex body for formulation and administration of the rules and regulations and laws related to agriculture in India.
Ministry of New and Renewable Energy	To develop and deploy new and renewable energy for supplementing the energy requirements of the country. Formulates policies and ensures their implementation.
Ministry of Petroleum and Natural Gas	Concerned with exploration and production of oil and natural gas (including the import of liquefied natural gas), refining, distribution and marketing, import and export, and conservation of petroleum products.
Ministry of Power	Deals with general policy in the electrical power sector and issues relating to energy policy and the coordination thereof. All matters relating to hydroelectric power (except small/mini/micro hydro projects of and below 25 MW capacity) and thermal power, and the transmission and distribution system network.
Ministry of Water Resources	Sustainable development, maintenance of quality and efficient use of water resources. Responsible for policy development and implementation of programmes for the development and regulation of the country's water resources.
Nepal	
Ministry of Agricultural Development	Responsible for managing agro-biodiversity
Food Security and Environmental Division	Focal point and implementing agency for the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)
Ministry of Science, Technology and Environment	Main objectives of contributing to sustainable economic development through sound environmental policies.
Climate Change Council	The highest-level coordination body to guide and direct formulation and implementation of climate change-related policies. Takes necessary measures to make climate change a part of the national development agenda.
Ministry of Forests and Soil Conservation (MoFSC)	International treaties and conventions. Overall responsibility for formulating and implementing policies and programmes related to the conservation and sustainable use of biodiversity, keeping records of relevant activities, and communicating with the CBD Secretariat and other conventions related to biodiversity.
National Wildlife Crime Control Committee and Wildlife Crime Control Bureaus (MoFSC)	To maintain coordination among different agencies for the prevention and control of wildlife poaching and trade.

Table 3.1 (continued)

Country/agency	Mandate
National Biodiversity Coordination Committee (NBCC) of MoFSC	Sustainable management of the forests and watersheds; conservation of plant resources, non-wood forest products, watershed and biodiversity, poverty reduction through the creation of forest based employment opportunities. Formulation, implementation, monitoring and evaluation of forest and soil conservation policy, conservation and management of forest and forestry products. Implementation of international treaties and agreements relating to forest, plant, wildlife, watershed, soil conservation and others.
Department of Forests (DoF) of MoFSC	The department oversees the regular supply of forestry goods and services, conserving wildlife, watershed and biodiversity, and contributes towards income and employment generation, ultimately supporting poverty reduction in the country. Plans, implements and coordinates forestry activities.
Department of Soil Conservation and Watershed Management (DSCWM) of MoFSC	To enhance the livelihoods and well-being of the people through sustainable watershed management at river basins. It aims to increase the productivity and utility of land and water, and to prolong the services of development infrastructures.
Department of National Parks and Wildlife Conservation (DNPWC) of MoFSC	Mandated for the conservation and management of the rich and diverse biological diversity of the nation, with special focus on wildlife and protected areas. It aims to conserve the country's major representative ecosystems, unique natural and cultural heritage, and extend protection to the valuable and endangered wildlife species.
Department of Forest Research and Survey (DFRS) of MoFSC	A government-designated forestry research and survey organisation. To conduct forestry sector research and forest resource assessment to generate and disseminate knowledge and information for sustainable management and utilisation of forest resources in Nepal.
REDD Forestry and Climate Change Cell of MoFSC	Works to prepare the Readiness Preparation Proposal, submitted to the World Bank's Forest Carbon Partnership Facility. Further strengthening of climate change adaptation and mitigation activities through the abatement of deforestation and forest degradation, and the promotion of sustainable forest management.
REDD-Implementation Centre (REDD-IC) of MoFSC	Third tier for reducing emissions from deforestation and forest degradation (REDD). Policy development, conducts relevant studies of REDD+, and executes a large number of the consultation and outreach programmes related to the REDD+ mechanism/process.
Pakistan	
Ministry of Climate Change	It is the primary national-level institution responsible for the environment. It maintains an Environment Wing responsible for, inter alia, environmental legislation, transboundary issues (including interprovincial and international), sustainable development, water and sanitation. It also acts as the Secretariat for Pakistan's Environmental Protection Council (PEPC). A dedicated Forestry Wing heads up all activities related to national policy, plans, strategies and programmes that cover ecology, forestry, wildlife, biodiversity and desertification. As with the Environment Wing, it has additional responsibility for coordinating, monitoring and implementing environmental agreements with other countries, international agencies and forums.
Environmental Protection Agency	It is an attached department of the Ministry of Climate Change and responsible for implementing the Environmental Protection Act, 1997, which provides for the protection, conservation, rehabilitation and improvement of the environment, for the prevention and control of pollution, and the promotion of sustainable development. It also provides technical assistance to the Ministry of Climate Change.
Provincial Forestry and Wildlife Departments	Pakistan's provincial governments have substantial authority for the management of forests, national parks and wildlife within their territories.
Ministry of Interprovincial Coordination	The Interprovincial Coordination Division in the Cabinet Secretariat is responsible for the general coordination between the Federal Government and the provinces in the economic, cultural and administrative fields; promoting uniformity of approach in formulation of policy and implementation among the provinces and the Federal Government in all fields of common concern.
Ministry of Law and Justice	Ministry of Law and Justice is an advisory service organisation providing services to all the offices of federal and provincial governments on legal, judicial and constitutional matters. Pursuant to the Environmental Protection Act of 1997, it maintains four Environmental Protection Tribunals with jurisdiction over complaints as defined by the Act.
Ministry of Petroleum and Natural Resources	The Petroleum & Natural Resources Division is responsible for ensuring the sustainable supply of oil and gas for the economic development and strategic requirements of Pakistan, and to coordinate the development of natural resources of energy and minerals.
Ministry of Science and Technology	The Scientific and Technological Research Division was established in 1964 for (i) coordination and implementation of national science and technology policy; (ii) promotion and coordination of research and utilisation of the results of research; (iii) development, production and utilisation of nuclear energy; and (iv) coordination of utilisation of scientific and technological manpower.

Table 3.1 (continued)

Country/agency	Mandate
Sri Lanka	
Ministry of Mahaweli Development and Environment (MoMDE)	Responsible for providing 'leadership to manage the environment and natural resources in order to ensure national commitment for sustainable development for the benefit of the present and future generations'.
Ministry of Sustainable Development and Wildlife (MoSDW)	Responsible for preparation, monitoring and assessment of policies, programmes and projects related to sustainable development, wildlife, botanical gardens and zoological gardens.
Forest Department of MoMDE + Department of Wildlife Conservation (DWC) of MoSDW	Collectively responsible for managing designated wildlife areas, coastal zones and all forest areas of the country, operating through a decentralised administrative structure.
Central Environment Authority (CEA)	Primarily responsible for enforcing the National Environment Act as well as formulating and implementing other environmental policies.

Sanjay Dubri is one of India's 50 tiger reserves. The future of iconic species such as the tiger depends on integrating the conservation of biodiversity with the immediate needs of rural populations, as well as protecting natural ecosystems from the pressures exerted by rapid economic growth and the globalisation of markets.

#3

Members of the Pardi tribe, traditional hunters living around the Panna tiger reserve in India, make carpets and brushes as part of a WWF-supported project to develop alternatives to poaching.

Nepal's Department of National Parks and Wildlife Conservation works with NGOs to detect poachers in a national park using hidden cameras. The integration of technology into species protection and management is offering new ways to make efficient use of limited resources.

3.1.2 Protected areas

PA coverage

The creation of protected areas is a core strategy for biodiversity conservation by national governments across the region. The 1631 protected areas in the region cover 361 358 km², or around 8 % of the land surface.[117] The lowest coverage is in India and Bangladesh (each about 5 %), in comparison with Pakistan (12 %), Nepal (23 %) and Sri Lanka (30 %). Bhutan has nearly half its land area in some form of protection (48 %) (see Table 3.2).

Protected area systems in all countries initially developed *ad hoc* from royal and colonial hunting reserves, watershed protection reserves and other early initiatives, rather than an analysis of the distribution and status of threatened species and biodiversity. As a result, ecological representativeness of PA systems is patchy. In **Bangladesh**, important forest types such as hill forests and deciduous sal forests remain under-represented within the system.[118] The network of PAs in **Sri Lanka** protects almost all of the large-scale hydrological reservoirs, providing water for agriculture and the generation of hydropower for the country. The NBSAP recognises the need to conduct a gap analysis to increase the representativeness of its protected area system[119], but the extent of conservation forests set aside for strict conservation has already been increased on the basis of biodiversity assessments made through the National Conservation Review[120], with more valuable wet-zone forests being added to the PA network. In **Pakistan**, many important ecosystems in the country are inadequately represented in the protected area system (e.g. marine, littoral and mangrove, riverine, desert, sub-tropical chir forest, dry temperate semi-evergreen scrub forest, sub-tropical mixed deciduous forest, Himalayan dry coniferous forest, Himalayan moist temperate forest, Balochistan dry coniferous forest). In **Nepal**, 84 % of the country's protected areas are in the mountainous regions, leaving the lowlands under-represented[121], and even in the mountain regions, such as the middle mountain, ecosystems remain under-represented[122]. **India**'s National Biodiversity Action Plan recognises the need to 'expand the protected area network of the country including conservation and community reserves, to give fair representation to all biogeographic zones in the country'[123].

Table 3.2 Summary of protected area coverage in the South Asia region

Country	Number of PAs*	Land area within PAs (km²)	% of total land area
Bangladesh	51	6 456	4.6
Bhutan	21	19 171	48.0
India	672	182 647	5.9
Nepal	49	34 898	23.6
Pakistan	178	98 288	12.3
Sri Lanka	660	19 898	29.9
Total region	1 631	361 358	8

*Source: World Database on Protected Areas, downloaded September 2017. Note that data is submitted by national governments and is in some cases incomplete, inaccurate, and may not include community-managed or customary protection. * This figure includes all PAs, terrestrial and marine.*

(117) www.protectedplanet.net
(118) Mukul S.A., M.B. Uddin, M.S. Uddin, S.A. Khan and B. Marzan (2008). Protected Areas of Bangladesh: Current status and efficacy for biodiversity conservation. Proc. Pakistan Acad. Sci. 45, pp. 59-68.
(119) MoMD&E (2016). National Biodiversity Strategic Action Plan 2016-2022. Biodiversity Secretariat, Ministry of Mahaweli Development and Environment, Colombo, Sri Lanka, xxi + 284 pp.
(120) Sri Lanka National Conservation Review.
(121) Shrestha U.B., S. Shrestha, P. Chaudhary and R.P. Chaudhary (2010). How representative is the protected areas system of Nepal? Mountain Research and Development, 30(3), pp. 282-294.
(122) Table 18, page 53. Nepal NBSAP.
(123) Ministry of Environment, Forests and Climate Change (2014). National Biodiversity Action Plan. Available at: https://www.cbd.int/doc/world/in/in-nbsap-v3-en.pdf

The International Union for the Conservation of Nature and Natural Resources' (IUCN) PA management categories[124] do not map exactly onto the national categories of PAs. However, for all countries except Sri Lanka, the protected areas with strict limitations on human use (IUCN Categories I, II and III) are fewer in number and coverage than those that allow some forms of resource utilisation (IUCN Categories IV, V and VI). In Pakistan many sites do not meet the IUCN criteria for protected areas.

PA funding

One of the most comprehensive efforts to define the costs of effective protection was a study of tiger source sites.[125] The cost of protecting 42 source sites covering about 90 000 km² is estimated at EUR 715 per km² per year, or a total of EUR 48 million per year. Across South and South-East Asia, the average combined commitment from range-state governments, donors and non-governmental organisations (NGOs) was found to be EUR 280 per km² per year, a shortfall of EUR 434 per km² per year.

Government financing mechanisms for PAs vary across the region. In **Bhutan**, the Bhutan Trust Fund for Environmental Conservation (BTFEC), established in 1992, has seen cumulative growth in its endowment from an initial EUR 16 million to over EUR 27 million in 2011.[126] The fund, which is currently invested in the capital market both in the USA as well as in Bhutan, generates interest or dividends to provide grants focusing on biodiversity conservation and local capacity building in Bhutan. The BTFEC has contributed to making 9 of the 10 protected areas operational through the development of conservation management plans and basic infrastructure. In **India**, the Government provides financial assistance through the Integrated Development of Wildlife Habitats scheme which has three components: (i) support to PAs, (ii) protection of wildlife outside PAs, and (iii) recovery programmes for saving critically endangered species and habitats. The budget allocation in 2014–2015 was EUR 8.9 million. Often, government budget allocations are focused on staff salaries and infrastructure costs with inadequate emphasis on costs for monitoring, protection and scientific management. Several protected area-focused projects lack appropriate levels of resource allocation for protection and management. The flow of resources and support to the site level is often insufficient for field-level implementation. With no national mandate, **Pakistan**'s protected area financing is a function of provincial government priorities and reports suggest that financing remains well below the needs of existing protected areas.[127]

(124) https://www.iucn.org/theme/protected-areas/about/protected-areas-categories
(125) Walston J., K.U. Karanth and E.J. Stokes (2010). Avoiding the unthinkable: What will it cost to prevent Tigers becoming extinct in the wild? Wildlife Conservation Society, New York.
(126) Irawan S., P. Choenphyel, C. Wangchuk, S. Dorji and A. Heikens (2012). Case Study Report: Bhutan Trust Fund for Environmental Conservation. A UNDP/BTFEC working paper. Available at: http://www.adaptasiapacific.org/sites/default/files/events/Bhutan%20TFEC%20Case%20Study%20report%20-%20final.pdf
(127) IUCN (2012). Pakistan Ecological and Financial Gap Analysis of the Protected Areas: A Step Towards Establishing A National System of Protected Areas. June 2012.

Tourists in Kanha National Park, India. National parks in South Asia attract hundreds of thousands of visitors annually, most of them nationals of the country. Visitors are an important source of revenue, but managing infrastructure and disturbance is an ongoing challenge.

Gharial in the National Chambal Sanctuary, India. Less than 200 of this critically endangered crocodile are thought to remain, and the sanctuary is the most important of four remaining localities for the species. It also protects freshwater turtles and the Ganges river dolphin.

The lack of resources results in low staff morale, lack of accountability, little incentive for good performance, limited technical capacity and inadequate legal knowledge. At many sites, effective patrolling and other management only happens in the context of a donor programme or with the support of an international NGO. An additional problem is that even where parks are able to attract significant income from tourist revenues, this income must be surrendered to central government, and is not available for management of the park.

PA effectiveness

Effective use of limited resources is as important as adequate funding. While the legal status of protected areas and regulations for their management are quite comprehensive across the region, inefficient resource allocation translates into fewer resources for law enforcement and weak institutions for PA management. As a result, job vacancies remain unfilled and frontline staff often lack the motivation, training and equipment to undertake rigorous management or enforcement duties.

Although systematic data is scarce, field reports indicate that protected areas are under threat and that management effectiveness is inadequate. In Bhutan, despite high coverage, most of the protected area boundaries have not been clearly demarcated and zoned for management interventions, resulting in ad hoc planning of services and facilities, and resource extraction often conflicting with conservation goals and rules. In addition, capacity is inadequate to monitor the borders of PAs and the lack of physical demarcation of the different zones also poses a challenge in ensuring legal protection of these areas in case of encroachment/land conversion. In Pakistan, management capacity is weak throughout the protected area system, one indication of the challenges being that there are no management plans for more than half the national parks, and none for wildlife sanctuaries and game reserves. In the Sundarbans region in Bangladesh, ill-equipped rangers struggle to combat piracy with criminal gangs suspected to be heavily involved in wildlife poaching. Resource-dependent community members are in turn threatened by criminals who demand high payments for protection or ransom. A legally mandated introduction of co-management for PAs in Bangladesh is ongoing but the Sundarbans mangrove forest differs from other PAs within the country with its management responsibilities still residing solely with the Forest Department.

In India, habitat within protected areas has been shown to be substantially modified due to encroachment, logging, fuelwood collection and other threats.[128] India has made significant efforts to measure the management effectiveness of some of its key protected areas, with the 2015 management effectiveness assessment of 43 tiger reserves measuring 31 criteria covering a variety of aspects of effectiveness.[129] The reserves scored between 45 % and 91 %, with 17 (40 %) categorised as 'very good' (scoring over 75 %), and 16 (37 %) as 'good' (scoring 60 % to 74 %). The results show an overall improvement in comparison to a similar assessment in the period 2005–2006, with 13 reserves improving their effectiveness, 26 the same, and only 4 experiencing a reduction in effectiveness. In India, PA management capacity is variable, with basic frameworks and resources in place for the Western Ghats and Central India but currently weak in many parts of the Himalayas, including in Namdapha National Park and other tiger reserves.

In some cases, protection and enforcement effort is focused on flagship species such as tigers and elephants, with other aspects (e.g. freshwater ecosystems) ignored. In the Chambal River Sanctuary in Central India, about 75 % of fishing, including that for subsistence, is illegal, and criminal fishing gangs have severely curtailed the access of regular fishers, as well as negatively impacting populations of fish, dolphins and other aquatic wildlife.

Transboundary protected areas

Several of the protected areas of Bhutan, Nepal, Pakistan and north-eastern India lie adjacent to each other across national borders, and so provide opportunities for transboundary conservation. The Kanchandzonga National Park in Sikkim and Kangchenjunga Conservation Area in eastern Nepal, and the Manas National Park in Bhutan and Manas Tiger Reserve in Assam (India) are two such complexes. There are additional opportunities to link protected areas across international boundaries by creating corridors and habitat linkages. Examples of these include Bardia in Nepal and Katerniaghat in India; Sukla Phanta in Nepal and Dudwa in India; and Sakteng in Bhutan and Eagle's Nest and Sessa Orchid Reserve in India. The entire Siachen–Saltoro border area of Pakistan and India has been proposed as a Transboundary Peace Park. Some priority sites such as Namdapha in Arunachal Pradesh provide opportunities for transboundary conservation with Myanmar and China, while Khunjerab National Park and Karakoram National Park in northern Pakistan border with China's Taxkorgan Reserve, serving as an important transboundary landscape for snow leopards and Marco Polo sheep. The two countries – along with Afghanistan and Tajikistan – drafted a proposal for a transboundary protected area for this region at a four-country meeting in Urumqi, China in 2006. A series of recommendations came out of this meeting, along with plans for the next steps, but various political events that followed slowed down its implementation. The 2013 Global Snow Leopard and Ecosystem Protection Programme's (GSLEP) Bishkek Declaration contains a commitment to increase bilateral and regional cooperation for snow leopard conservation in transboundary landscapes in the region.

3.1.3 Wildlife law enforcement

Across the region, wildlife law enforcement is governed by relatively comprehensive legal and policy frameworks. All countries except for Bhutan have specific wildlife protection laws and policies, and Bhutan's Forest and Nature Conservation Act of 1995 includes wildlife protection in the country. In Bangladesh, the Wildlife Conservation and Security Act (1974, 2012 and amended in 2014) is the most recently amended law that relates to wildlife protection. In compliance with the act, the government has established the Wildlife Crime Control Unit, which is headed by the Conservator (Wildlife) but under the

(128) Clark N., E.H. Boakes, P.J.K. McGowan, G.M. Mace and R.A. Fuller (2013). Protected Areas in South Asia Have Not Prevented Habitat Loss: A Study Using Historical Models of Land-Use Change. See http://dx.doi.org/10.1371/journal.pone.0065298

(129) Government of India (2015). TIGER-MEETR, Measuring the Management Effectiveness of Tiger Reserves in India. Available at: http://www.wii.gov.in/images//images/documents/tiger_meetr1_2015.pdf

Lord Derby's parakeet inhabits old-growth conifer and pine-oak forests in north-east India and China. The species' population is declining because of intense hunting for the pet trade.

operational control of an assistant conservator of forests. Implementation of a SMART (Spatial Monitoring and Reporting Tool) approach to wildlife enforcement and monitoring patrols in Bangladesh has been recommended to tackle poaching[130].

In India, the Wildlife Protection Act 1972 is an important statute that provides a powerful legal framework for the protection of wildlife, the establishment of protected areas, the management of habitats, and the regulation and control of hunting and trade in parts and products derived from wildlife. The Wildlife Crime Control Bureau was formed in 2007 to address the problem of illegal wildlife trade in India by bringing together police, forest and customs officers, with central government funding. However, insufficient human resources and inadequate authority are both impediments to its effectiveness, and prosecution and conviction rates are low, with a lack of intelligence-based enforcement.[131] At state level, several governments have constituted 'tiger cells' or 'special task forces' within their police departments with a mandate to investigate wildlife crime. There is a move to implement 'smart patrolling' in tiger reserves, through the use of M-STrIPES (Monitoring System for Tigers. Intensive Protection and Ecological Status).[132] The National Tiger Conservation Authority is now looking at technology-based surveillance options such as high definition cameras on towers (a project called 'e-eye' in Corbett tiger reserve) and drones. The Tiger Authority and state governments are also developing special tiger protection forces for tiger reserves comprising ex-servicemen, forest and police officers, and local people.[133]

In Nepal, the National Parks and Wildlife Conservation Act (1973) regulates hunting and wildlife protection. The Government of Nepal set up three wildlife crime-control committees to work together nationally and in the districts to combat poaching and illegal wildlife trade in coordination with the Department of National Parks and Wildlife Conservation, the Forest Department, Customs, the army, the police, the National Investigation Department and the Central Investigation Bureau. In Sri Lanka, the Fauna and Flora Protection (FFPO Amendment) Act, No 22 of 2009 and the Customs (Amendment) Act No 2 of 2003 (An Act to Amend Custom Ordinance No 17 of 1869) are the two main laws relating to wildlife protection.

In Pakistan, the management of wildlife as a resource is primarily a function of provincial laws and regulations. Federal

(130) USAID Bangladesh. 2016. Wildlife Capacity Gaps Assessment of the Bangladesh Forest Department in the Sundarbans.
(131) Wright, B. WPSI. Pers. comm.
(132) http://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/Global-Tiger-Recovery-Program-Nov-4.pdf
(133) Wildlife Protection Society of India.

Grassland of Parsa National Park, Nepal. This grassland used to be a settlement, but it was voluntarily relocated by the Nepalese Government in 2013. The grassland now supports a healthy population of tigers.

legislation does not apply to the Federally Administered Tribal Areas, Provincially Administered Tribal Areas (PATA) and Gilgit-Baltistan, unless the executive branch explicitly extends its jurisdiction for a particular issue. All of these areas are important for biodiversity conservation and at present there is no overarching federal legislation that can harmonise approaches among the provinces, although there is a federal act to implement wildlife trade controls to meet Pakistan's obligations under the Convention on International Trade in Endangered Species (CITES).[134] This act applies to the whole of Pakistan[135], but it is restricted to regulating international trade in CITES-listed species. As a result, trade in non-listed species and trade that is not international remain within the jurisdiction of provincial legal instruments. In 2005, an IUCN assessment stated that '[f]ederal legislation governing wildlife is minimal and archaic… Older federal legislation regulates the hunting and capture of specific animal species but does not provide for the coordinated management and conservation of wildlife or habitat.'[136].

All six countries in the region belong to the South Asia Wildlife Enforcement Network (SAWEN).[137] The objectives of SAWEN are linked to more rigorous and coordinated approaches to tackle transboundary wildlife crime. The aims include enhancing communication, facilitating strong formulation of policies, and strengthening approaches to law enforcement through the use of science-based tools and techniques, including forensics as integral tools for fighting wildlife crime.

All countries in the region are CITES signatories and hence have an obligation to implement CITES regulations and procedures. However, the progress with domestic legislation to enact and implement CITES varies across the region.[138] Appropriate listings of species in trade under the CITES convention is important to focus resources on action for the most threatened species – an example being the listing of all eight pangolin species in Annex 1 of the convention at the September 2016 meeting of the parties[139], a move that was supported by all six countries in the region. Adequate financial resources and political commitment will be necessary to enforce species listings in CITES Appendices I and II.

3.1.4 National and local policies

A vast array of government policies, regulations and programmes impact the conservation of biodiversity across the region. In addition, recognising the importance of natural resource conservation in the context of development pressures, several countries have developed **sustainable development**

(134) The Pakistan Trade Control of Wild Fauna and Flora Act, 2012. (Act No XIV of 2012).
(135) The Pakistan Trade Control of Wild Fauna and Flora Act, Article 1, subparagraph (2).
(136) IUCN (2005). Environmental Law in Pakistan: Governing Natural Resources and Processes and Institutions that Affect Them. Part I: Federal.
(137) http://www.sawen.org
(138) A CITES assessment in early 2016 classified Bangladesh, India and Pakistan as category 2: 'legislation that is believed generally to meet one to three of the four requirements for effective implementation of CITES', while Bhutan, Nepal and Sri Lanka were category 3: 'legislation that is believed generally not to meet any of the four requirements for effective implementation of CITES'. The four requirements are: national legislation implementing the convention, designation of a responsible CITES authority, prohibition of trade in violation of the convention, provision for penalties and /or confiscation of specimens traded. CITES (2016). National Laws for Implementation of the Convention. https://cites.org/sites/default/files/eng/com/sc/66/Inf/E-SC66-Inf-19.pdf
(139) https://newsroom.wcs.org/News-Releases/articleType/ArticleView/articleId/9303/CITES-CoP17-Victory-Today-for-Pangolins.aspx, accessed 13 July 2017.

Construction of the Dagachhu hydropower plant, the first scheme in Bhutan to export electricity to neighbouring countries. Bhutan's Sustainable Hydropower Policy allows for 1 % of the royalties of hydropower sales to be invested in integrated watershed management.

Managed harvest of Indian kino trees, Western Ghats. A local NGO works with communities in the Sahyadri-Konkan region to produce high-value products from a species that was being exploited for fuelwood. Maximising the return from each tree has increased local incomes and generated revenue for conservation.

programmes and policies, such as Sri Lanka's *Punarudaya*[140], its Accelerated National Environment Conservation Programme (2016–2018), which identifies the importance of conserving the country's natural resources, particularly forestry and wildlife resources. The National Planning Commission in Nepal recently launched the National Strategic Framework for Sustainable Development.[141] Similarly, the Planning Commission in Bangladesh launched the National Sustainable Development Strategy 2010–2021[142] to meet the challenges of economic, social and environmental sustainability in alignment with global sustainable development goals.[143]

Land zoning policies exist in many countries in the sub-region, which are specifically related to allowable activities within and outside the protected area systems. In Bangladesh, ecologically critical areas around protected areas prohibit detrimental activities within 2 kilometres of the borders of protected areas. However, rules to implement this provision are yet to be formulated. Similarly, the Indian Board for Wildlife mandated Ecologically Sensitive Zones and Areas in 2002 to constitute areas of up to 10 kilometres from the boundaries of protected areas with limitations on development activities.

Policies to increase the protection status of lands outside protected areas and devolve management to local communities through **community-based management** have emerged in many countries. Local land ownership and tenure facilitated by mechanisms such as the Forest Rights Act in India and the Community Forest User Groups in Nepal have played an important role in increasing participatory approaches to conservation. In Nepal, participatory governance in the form of community and collaborative forests have been successful in devolving management of protected areas, increasing livelihoods and contributing significantly to forest conservation.[144] In addition, eight forests covering a total area of 1 338 km² in biodiversity-rich wildlife corridors have been declared protected forests.[145] In India, Conservation Reserves and Community Reserves are legal protected area categories that typically act as buffer zones to, or connectors and migration corridors between, established national parks, wildlife sanctuaries, and reserved and protected forests. Very few such reserves have been designated, however. In Bhutan, the development of an institutional framework to operationalise and manage corridors in the extensive protected area system facilitated greater priority for forest corridors by Bhutan's territorial Forest Divisions with coordination by the Nature Conservation Division. Forest corridors are afforded greater priority for sustainable management than the rest of Bhutan's Government-managed reserve forests.

Pakistan has a history of community-based conservation, which is partly reflected in a legal system that devolves substantial authority to the local level. The absence of any national-level restrictions on community-based management has helped a number of important and successful community-based approaches to be developed in these three areas. For example, the Torghar Project (PATA) was established in 1986 to manage trophy hunting of markhor. In Gilgit-Baltistan, 65 new community-level governance institutions with over 100 community rangers are protecting roughly 10 000 km² of key mountain habitat. This work, which began in 1997, has led to a 70 % increase in the population of markhor in the landscape and a near complete cessation of illegal poaching and logging.[146]

Payments for ecosystem services' (PES) schemes at various scales are being explored across the sub-region. In Bhutan, the 2008 Sustainable Hydropower Policy allows for 1 % of the royalty of hydropower sales to be redirected to the Ministry of Agriculture and Forests for it to be invested in integrated watershed management. However, the absence of an effective regulatory framework for collecting and using the revenue limits the effectiveness of the PES mechanism (Ugen Norbu, pers. comm.). REDD+ strategies and mechanisms are being developed across the region. In Nepal, the Government has been promoting REDD+ since 2008 as a mechanism to control forest loss and degradation. In Sri Lanka, India, Pakistan and Bangladesh, REDD+ strategies have been developed under the UN REDD Programme.[147]

An unusual form of payment for use that has been successful in Pakistan is trophy hunting for wild sheep and goats. Well-managed trophy hunting has had positive impacts for conservation, and the community-based markhor trophy hunting programmes in Torghar, Chitral and Gilgit-Baltistan of Pakistan are considered major successes. Through this programme, four markhor trophies are sold to international hunters each year in each province, with 80 % of proceeds (one trophy permit costs between EUR 50 000 and EUR 100 000) invested directly back to communities in the conservancy area for local conservation and social development initiatives, with the remaining 20 % going to the local wildlife department for conservation-related expenses and management. This direct benefit has played a key role in changing attitudes toward wildlife, creating a real sense of a vested interest in those closest to, and most capable of, protecting the resource. In some areas markhor have seen a remarkable comeback, with up to 70 % increases from what were previously dramatic declines just a few decades ago.

3.1.5 International agreements and transboundary approaches

International agreements can be categorised into those that operate at site level, those focused on particular species or groups, and those that commit a country to a series of policy and programmatic actions. Key site-level agreements are Ramsar, the United National Educational, Scientific and Cultural Organisation (UNESCO)-Man and Biosphere (MAB), and UNESCO World Heritage convention. Agreements focused on species and groups include the Bonn Convention on Migratory Species and CITES, while the country-level agreements include the United Nations Framework Convention on Climate Change (UNFCCC) and CBD. Tables 3.3 and 3.4 provide a list of these agreements relevant to the countries in the region. There are 66 Ramsar sites, 15 MAB reserves and 16 natural World Heritage Sites, the majority of them in India. All six countries are signatories to CITES, CBD and the UNFCCC. All except Bhutan and Nepal are also signatories to the Convention on the Conservation of Migratory Species of Wild Animals (CMS). The countries covered by these reports are also signatories of the UN Convention on Transnational Organised Crime and the UN Convention Against Corruption. Both conventions contain obligations and provide platforms for international cooperation, which could be used to address wildlife trafficking.

The UN Sustainable Development Goals (SDGs), adopted by Heads of State, including all the countries in the region, in September 2015, recognise the links between environment and sustainable development. Goal 14 (life under water) and 15 (forest conservation, land degradation, conservation of wild and domestic biodiversity) are directly relevant to biodiversity, while 7 (energy), 8 (work and economic growth), 9 (industry and infrastructure) and 11 (sustainable cities and communities) address broader drivers. The SDGs specifically recognise wildlife trafficking as a key issue.[148]

Transboundary approaches have been developed where protected areas and areas of important habitat are contiguous across national boundaries (see also section 3.1.2), and where international cooperation is needed to address problems. For example, in the South Asia sub-region, there are several transboundary landscape initiatives in the Himalaya and the Sundarbans areas. The thematic focus of these initiatives ranges from species-focused initiatives such as the Global Snow Leopard and Ecosystem Protection Programme (GSLEP)[149] and the Integrated Tiger Habitat Conservation Programme (ITHCP)[150] to large-scale, ecosystem-focused initiatives such as Hi-Life and HIMALICA (both implemented by the International Centre for Integrated Mountain Development, ICIMOD[151]), which are large EU-funded programmes aimed at sustainable development in the context of climate change or Ecosystems for Life (implemented in India and Bangladesh). Transboundary wildlife trafficking initiatives include SAWEN , the Snow Leopard and

(140) www.news.lk/news/business/item/10298-gov
(141) http://www.iucn.org/about/union/secretariat/offices/asia/asia_where_work/nepal/?22335/Nature-Conservation-National-Strategic-Framework-for-Sustainable-Development-Launched
(142) http://www.plancomm.gov.bd/wp-content/uploads/2013/09/National-Sustainable-Development-Strategy.pdf
(143) https://sustainabledevelopment.un.org/sdgs
(144) Nepal NBSAP.
(145) UNDP 2014. Biodiversity for sustainable development: Delivering results for Asia and the Pacific. See http://www.undp.org/content/dam/undp/library/Environment%20and%20Energy/biodiversity/UNDP-Biodiversity-for-Sustainable-Development-in-Asia-Pacific.pdf
(146) See https://pakistan.wcs.org/
(147) REDD+ Strategy for Sri Lanka.
(148) Goal 15 on the sustainable use of terrestrial ecosystems includes commitment 15.7: 'Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products'. https://sustainabledevelopment.un.org/post2015/transformingourworld, accessed 22 April 2016.
(149) http://www.globalsnowleopard.org/
(150) https://www.iucn.org/theme/species/our-work/action-ground/integrated-tiger-habitat-conservation-programme
(151) www.icimod.org

Table 3.3 Number of sites listed under international agreements and conventions

Country	Ramsar[i]	MAB[ii]	WHS (natural)[iii]
Bangladesh	2	0	1
Bhutan	3	0	0
India	26	10	7
Nepal	10	0	2
Pakistan	19	1	4
Sri Lanka	6	4	2
Total	66	15	16

Key to conventions: Ramsar: the convention on wetlands; MAB: UNESCO Man and Biosphere programme; WHS: UNESCO Natural World Heritage Sites under the World Heritage Convention.

(i) http://www.ramsar.org/, accessed 13 March 2016
(ii) http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/asia-and-the-pacific/, accessed 13 March 2016
(iii) http://whc.unesco.org/en/list accessed 13 March 2016

Table 3.4 Status of the biodiversity-related conventions in the region

Country	CITES[i]	CMS[ii]	CBD[iii]	UNFCCC[iv]
Bangladesh	Party	Party	Party	Party
Bhutan	Party	Non-party	Party	Party
India	Party	Party	Party	Party
Nepal	Party	Non-party	Party	Party
Pakistan	Party	Party	Party	Party
Sri Lanka	Party	Party	Party	Party

Key to conventions: CITES: Convention in International Trade in Endangered Species of Wild Fauna and Flora: CMS: the Convention on the Conservation of Migratory Species of Wild Animals: CBD: Convention on Biological Diversity; UNFCCC: United Nations Framework Convention on Climate Change

(i) https://cites.org/eng/disc/parties/chronolo.php?order=field_country_official_name&sort=asc, accessed 13 March 2016.
(ii) http://www.cms.int/en/parties-range-states, accessed 13 March 2016.
(iii) https://www.cbd.int/information/parties.shtml, accessed 13 March 2016.
(iv) http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php, accessed 13 March 2016

Sloth bears live in forests in India, Nepal, Sri Lanka and perhaps Bhutan. They are now extinct in Bangladesh. They are adapted to eat ants and termites, but also consume fruit. They are the only bear species where the female regularly carries the young on her back. They are declining as a result of forest clearance, disturbance and poaching.

Wildlife Law Enforcement Network (SLAWEN)[152] and the World Bank-funded Strengthening Regional Cooperation for Wildlife Protection project[153].

3.2 Civil society

The South Asia sub-region has a diverse, energetic and innovative civil society actively engaged in developing and implementing approaches toward wildlife conservation in particular and environmental sustainability in general. There are large numbers of NGO and CSO initiatives underway, especially in India, Bangladesh and Sri Lanka. The Critical Ecosystem Partnership Fund (CEPF) represents the single largest funding mechanism to support civil society initiatives in the Western Ghats and Eastern Himalaya hotspot. The CEPF[154] ecosystem profiles for Western Ghats and Eastern Himalayas provide more information on the many national and international NGOs and CSOs actively involved in conservation in these regions.[155] While there is tremendous variability in the structures, goals and impacts of CSOs across the region, a number of common challenges exist: lack of financial sustainability, shortage of adequately qualified, professional employees and high employee attrition rates. CSOs play an important role working alongside government institutions to jointly address the challenges facing biodiversity conservation within a context of expanding economies in the region, but most do not have the capacity required to be able to perform their role effectively.

3.2.1 CSOs in South Asia

CSOs in Bhutan have existed for many years as community associations and organisations, forming an integral part of the traditional Bhutanese society. To legally formalise the existence of civil society and further promote its growth in Bhutan, the government enacted the CSO Act of Bhutan in 2007 and the CSO Rules and Regulations made under the same act in 2010.[156] The policy of preserving the country's culture and tradition encourages the diversity of both traditional community organisations and contemporary associations and organisations. The government has initiated reforms in the existing governance system with an increasing emphasis on the role of civil society. The Royal Society for the Protection of Nature is a prominent national NGO. However, while strong civil society groups exist with positive backing by national and local government agencies, the number is limited compared to other countries in the sub-region.

(152) www.sawen.org
(153) http://www.projects.worldbank.org/P126193/second-phase-apl-strengthening-regional-cooperation-wildlife-protection-asia?lang=en&tab=overview
(154) CEPF is a joint initiative of l'Agence Française de Développement, Conservation International, the European Union, the Global Environment Facility, the Government of Japan, the MacArthur Foundation and the World Bank.
(155) www.cepf.net
(156) Asian Development Bank. Civil Society Brief: Bhutan.

A series of natural disasters and political upheavals in Bangladesh during the 1940s and subsequent decades provided the impetus for the development of what is today one of the world's largest NGO sectors. NGOs such as the Bangladesh Environmental Lawyers Association and Bangladesh Legal Aid and Services Trust are working to expand public interest litigation, in part by providing greater representation for poor people. The government has a generally positive attitude toward the NGO sector, as shown in its 5-year plans and other official documents.

NGOs in Nepal have a relatively short history. Following the dissolution of the Panchayat regime and the establishment of parliamentary democracy in 1990, the number of NGOs operating in Nepal has increased dramatically, to about 60 000. Some strict regulations remain, including the requirement that NGOs register annually with the District Administration Office. The relationship between the Government and NGOs is sometimes uneasy due to a lack of trust and a clear understanding of each other's roles. The growing trend among donor countries to channel development funds through NGOs has led to a scaling down – or even complete termination – of many government-run services and programmes, with a corresponding increase in NGO operations.

India has a long history of CSOs[157], and there are over 1 million NGOs active in the country. NGO approaches to government now range from strongly oppositional to closely collaborative. Broadly, there is no federal law enabling or regulating the voluntary sector, but there is a complex array of state legislations. Currently, there are significant changes in the way civil society can operate, with widespread international concern regarding the rights and liberties accorded to CSOs[158].

CSOs in Sri Lanka have had a long history and currently there are a large number of NGOs/CSOs working across many sectors including the environment[159]. There is no rigid definition in the legislation of what constitutes an NGO and not all NGOs are registered. Relations between the government and civil society have been variable with periodic tightening or easing of tensions between them.

Pakistan, because of its history and interest in encouraging management at the local level, has a large number of international and national NGOs working in the environment sector, and it is also a leader in devolving natural resource management to local CSOs. Numerous examples exist of local organisations working successfully in the northern mountains, often initially established and supported by international organisations but now managing their own projects and programmes.

3.3 Private sector initiatives/ public-private partnerships for conservation

Private sector engagement in conservation takes on many different forms within the South Asia region and is active at various scales. Climate change is viewed as an important area of partnership with the private sector in a number of countries in the region. The private sector is recognised as a player in REDD+[160] investments and a means to scale up climate finance in India[161]. The Ecosystem Alliance, currently only active in India within the sub-region[162] (ended in 2015), provided a useful platform for private sector partnerships to address conservation issues[163]. The HSBC Climate Partnership is a 5-year partnership between HSBC, The Climate Group, Earthwatch Institute, World Wide Fund for Nature (WWF) and the Smithsonian Tropical Research Institute in order to inspire action on climate change, including in India.[164] There are a number of initiatives developing new models of collaboration between governments and the private sector for forest conservation and management efforts. In India these include a United States Agency for International Development (USAID) initiative, supported by the Bombay Chamber of Commerce and Industry, to engage the private sector in dialogue on the new Corporate Forest Responsibility Charter. The Charter has a target for investment of corporate social responsibility resources in forest conservation.[165] There are a number of young private sector-linked initiatives developed by CSOs in India, such as FERAL[166] and Keystone Foundation[167] and triggered by the CEPF investment, which aims to leverage support from private companies to support conservation incentives that engage small landholders in conserving

(157) Asian Development Bank. Civil Society Brief: India. See https://www.adb.org/publications/series/civil-society-briefs
(158) Mitra, D. (2016). India 'Disassociates' from Key Clauses in UN Resolution on NGO Rights. The Wire, 6 July. See http://thewire.in/49090/india-fcra-unhrc-resolution-on-ngo-funding/; Bhatnagar G.V. (2016). UN Human Rights Experts Urge India to Repeal FCRA. The Wire, 17 June. See http://thewire.in/43625/un-human-rights-experts-urge-india-to-repeal-fcra/; (2016). Difficulties of NGOs operating in India 'big concern'. The Times of India, 6 July. See http://timesofindia.indiatimes.com/city/bengaluru/Difficulties-of-NGOs-operating-in-India-big-concern/articleshow/53083853.cms
(159) Asian Development Bank. Civil Society Brief: Sri Lanka. See https://www.adb.org/publications/series/civil-society-briefs
(160) http://www.ecosystem-alliance.org/sites/default/files/documents/REDD%20%20Private%20Sector%20Declaration.pdf
(161) GIZ report 2015. The role of the private sector to scale up climate finance in India.
(162) http://www.ecosystem-alliance.org/countries/india
(163) http://www.ecosystem-alliance.org/themes-overview
(164) https://www.devex.com/impact/partnerships/hsbc-climate-partnership-521
(165) https://2012-2017.usaid.gov/india/press-releases/aug-28-2014-bcci-and-usaid-call-private-sector-join-forest-conservation
(166) www.feralindia.org
(167) http://keystone-foundation.org

Women in villages on the edge of the Sundarbans mangrove forest, Bangladesh, work with civil society organisations to reduce their dependency on forest resources and to improve rural livelihoods. The initiative is part of protected area co-management efforts which are supported by bilateral donors and the private sector.

biodiversity, reducing land degradation and mitigating climate change[168]. Ecotourism is viewed as an opportunity to engage the private sector more effectively to help achieve conservation outcomes.

In Bangladesh, USAID supports public-private conservation alliances for protected area management.[169] The Nishorgo Support Project prepared Arannyak, a Bangladesh CSO to take on large-scale, protected area level co-management initiatives with support leveraged from Banglalink, the Bangladeshi operation of Orascom Telecom. In 2007, Banglalink, in association with commercial tour operators and the Nishorgo Support Project, supported a nationwide campaign for responsible tourism among students. Under the Climate Resilient Environment and Livelihoods project funded by USAID, the fair-trade organisation Hathay Bunano has employed women to reduce their dependency on forest resources and to improve rural livelihoods.

Both the Global Tiger Initiative[170] and GSLEP[171] are global alliances between governments, international organisations, civil society, the conservation and scientific community, and the private sector. The partners are committed to working together toward a common agenda to save tigers and snow leopards from extinction. The Rainforest Alliance certification in the agriculture and forestry sectors engages the private sector and civil society to achieve positive conservation, and social and economic outcomes, and currently has projects in India, Bangladesh and Sri Lanka.[172]

Biodiversity offsets represent an important mechanism for private sector engagement in biodiversity conservation within the principles of the 'mitigation hierarchy', a tool designed to help users limit, as far as possible, the negative impacts of development projects on biodiversity and ecosystem services.[173] Existing global and national sites that are important for biodiversity conservation, such as key biodiversity areas, offer promising locations for offsetting business impacts on biodiversity.[174] Offset mechanisms in the oil and natural gas sector are also evolving rapidly.[175]

(168) CEPF. Western Ghats APO.
(169) https://www.devex.com/impact/partnerships/public-private-conservation-alliance-for-protected-areas-management-283
(170) http://www.worldbank.org/en/topic/environment/brief/the-global-tiger-initiative
(171) http://www.globalsnowleopard.org/
(172) http://www.rainforest-alliance.org/work/agriculture
(173) The Biodiversity Consultancy, 2015.
(174) The Biodiversity Consultancy, 2013. Globally and nationally important sites offered as biodiversity offset opportunities.
(175) IPIECA 2016. Biodiversity and Ecosystem Service Fundamentals. Guidance document for the oil and natural gas industry.

3.4 International agencies and donors

Tables 3.5 and 3.6 provide a summary of Official Development Assistance (ODA) received by the six countries in the region. India received the highest amount of ODA followed closely by Pakistan and then Bangladesh, Nepal, Sri Lanka and Bhutan. Japan is the largest contributor of ODA to these six countries, followed by the United Kingdom.

Table 3.5 Net ODA receipts (from DAC countries) for each country in the South Asia region from DAC countries

Country	Net ODA (EUR million)				
	2011	2012	2013	2014	2015
Bangladesh	832.62	1 008.46	1 113.08	1 062.54	923.54
Bhutan	55.15	61.85	45.62	37.54	28.62
India	1 580.15	1 165.23	1 414.38	1 455.77	1 614.31
Nepal	378.38	398.85	382.46	417.54	512.69
Pakistan	2 019.77	1 224.15	1 330.85	1 355.31	1 331.38
Sri Lanka	297.31	274.08	208.85	219.54	110.77
Total	5 163.38	4 132.62	4 495.23	4 548.23	4 521.31

Source: OECD (2017).[176]

Table 3.6 Net ODA disbursements from DAC countries and EU institutions to the South Asia region in 2015

Country	Net ODA (EUR million) (2015)								
	EU	Australia	Canada	Denmark	Finland	France	Germany	Italy	Japan
Bangladesh	61.15	37.69	37.85	7.92	0.62	-5.69	63.69	0.54	288.62
Bhutan	1.38	5.46	1.15	0.00	0.31	0.00	0.62	0.08	12.31
India	203.62	3.23	7.46	1.15	1.00	42.31	578.15	9.31	667.46
Nepal	36.92	27.92	22.38	16.54	20.62	0.92	29.92	2.08	37.54
Pakistan	95.00	40.62	26.38	12.15	0.54	5.00	76.08	33.92	76.62
Sri Lanka	90.23	19.62	3.08	-0.38	0.92	4.85	-1.69	0.92	25.69
Total	488.31	134.54	98.31	37.38	24.00	47.38	746.77	46.85	1 108.23

([176]) OECD (2017). Geographical Distribution of Financial Flows to Developing Countries 2017: Disbursements, Commitments, Country Indicators. OECD, Paris. Available at http://www.keepeek.com/Digital-Asset-Management/oecd/development/geographical-distribution-of-financial-flows-to-developing-countries-2017_fin_flows_dev-2017-en-fr/

Table 3.6 (continued)

Country	Net ODA (EUR million) (2015)									
	Korea	Netherlands	New Zealand	Norway	Sweden	Switzerland	UK	USA	Others	Total
Bangladesh	40.15	35.85	0.31	3.31	25.62	28.77	192.38	162.77	3.15	984.69
Bhutan	0.54	0.00	0.00	2.77	0.08	3.15	0.08	0.77	1.31	30.00
India	0.15	0.54	13.15	0.15	4.54	9.77	218.08	46.54	11.31	1 817.92
Nepal	13.54	7.54	2.23	46.92	7.54	40.54	103.69	124.15	8.62	549.62
Pakistan	4.38	4.92	0.00	10.15	9.69	14.54	439.31	573.92	3.15	1 426.38
Sri Lanka	21.15	0.00	0.46	4.08	1.38	5.69	28.92	-5.46	1.54	201.00
Total	79.92	48.85	16.15	67.38	48.85	102.46	982.46	902.69	29.08	5 009.62

Negative numbers are where repayments on ODA loans exceed income/receipts
Source: OECD (2017). [177]

Bilateral donor agencies

European Union

The EU provides bilateral development aid to Bangladesh, Bhutan, Nepal, Pakistan and Sri Lanka. India no longer qualifies for bilateral development aid but is eligible to receive support through programmes with a regional or thematic focus. A total envelope of EUR 1 260 million has been allocated for regional actions in Asia for the period 2014–2020. Of this, EUR 889.5 m will be used via the Regional Asia Multiannual Indicative Programme, and a further EUR 370.5 million will be used to support higher education via Erasmus+. The Regional Asia Multiannual Indicative Programme has three focal areas: regional integration (including trade), aid to uprooted people and promotion of a green economy.

The main (>EUR 1 million EU investment) projects between 2010 and 2016 in the fields of global climate change and sustainable economy totalled around EUR 48 million, although some of this is shared with other regions. There were no projects addressing biodiversity conservation in this period (*c.f.* other regions covered by this study, where investment in biodiversity is typically on a similar level to sustainable production and consumption).

EU allocations in the multiannual indicative plans (MIPs) for the five countries eligible for bilateral aid total nearly EUR 1.95 billion for the period 2014–2020. In Bangladesh, the MIP was adopted with a total of EUR 690 million for three focal sectors: democratic governance, education and skills development, and food and nutrition security. Environment and climate change will be integrated in all sectors. In Pakistan, the total allocation was set at EUR 653 million and focused on: rural development (52 %); education (32 %); and good governance, human rights and rule of law (15 %). In 2014, the EU continued its support to Bhutan in the sector of renewable natural resources, assisting Bhutan with the sustainable development of these resources by creating an enabling environment, including further development of its institutional regulatory frameworks and developing the value chain of renewable natural resources. Under the Global Climate Change Alliance Facility, the EU is assisting Bhutan in mainstreaming climate change into the renewable natural resources sector. The Commission adopted the MIP for 2014-2020 for Bhutan, with an allocation tripled (EUR 42 million) in comparison to the previous programming period. The EU will support local governments and civil society, as well as sustainable agriculture and forestry, in full alignment with the Royal Government of Bhutan's 11th Five-year Plan. In Nepal, the European Commission adopted the MIP 2014–2020 with an allocation of EUR 360 million, tripled compared to the previous programming period. The EU will support sectors of education, sustainable rural development, democracy and decentralisation. In Sri Lanka, the EU launched its new MIP 2014–2020, which features an increase in the aid portfolio from EUR 112 million to EUR 210 million for rural development, subject to the developments in the country, notably as regards human rights and the implementation of development cooperation.

Within the EU 2014–2017 MIPs of the South Asian countries are several biodiversity-related projects. In Bangladesh, the EU-funded Sundarbans Environmental and Livelihoods Project was the first of its kind in the sustainable management and conservation of Sundarbans.

([177]) OECD (2017). Ibid.

The EU's overall objective in India is to support the country's efforts towards sustainable growth and to build mutual understanding on global environmental issues including climate change. Environment is recognised as a strategic area for dialogue in the EU-India Partnership, and the Joint Action Plan provides the basis for enhancing cooperation on environment and climate change. The launch of an *EU-India Environment Forum* and the *EU-India Initiative on Clean Development and Climate Change* are some of the key commitments undertaken to strengthen bilateral cooperation. EU technical cooperation for environment in India aims to support the exchange of best practice policies and implementation, and the enforcement of existing regulations and policies. The CASCO project aims at supporting the implementation of the Indo-European Partnership for Research and Innovation by bringing together expert clusters from the EU and India in the field of climate adaptation, within the focus area of sustainable environment and water.

In response to the crisis in wildlife trafficking, the EU is funding a joint project of CITES and the United Nations Office on Drugs and Crime (UNODC), the Asia *Wildlife Enforcement and Demand Management project*, which commenced in May 2016. The 4-year, EUR 5 million project will work in South Asia (Bangladesh, Bhutan, India, Nepal, Sri Lanka), South-East Asia (Indonesia, Malaysia, the Philippines), the Greater Mekong (Cambodia, Lao PDR, Myanmar, Thailand, Vietnam) and China, with a focus on national-level frameworks, capacity for investigation and prosecution, regional collaboration, enforcement in key protected areas and raising the awareness of decision-makers[178]. Pakistan is not among the countries targeted by this project.

United Kingdom

The primary focus for the British Government's international development assistance is on poverty alleviation, governance, climate change adaptation and sustainable development for Bangladesh and Nepal. DFID is active in Pakistan, but not in India, Bhutan or Sri Lanka. In Pakistan, its approved budget for the 2016/2017 financial year was approximately EUR 500 million, with activities focused principally on poverty reduction and stability, including projects dedicated to education; women and children's health; creating jobs and supporting economic growth; strengthening democracy and governance; and building peace and stability in conflict-affected areas.[179] The British Government's Illegal Wildlife Trade Challenge Fund tackles wildlife trafficking but there are no projects currently active in any of the six countries in the South Asia region.[180]

Germany

GIZ has worked in Pakistan for 26 years and had 16 active projects in 2016, one of its largest portfolios worldwide. Within Pakistan, GIZ focuses on Khyber Pakhtunkhwa Province and concentrates on good governance, basic education and vocational training, renewable energies and energy efficiency, and health. In India, GIZ supported the Incentives for sustainable management of biodiversity and ecosystem services project, commissioned by the German Federal Ministry for Economic Cooperation and Development (completed in 2015). GIZ also supports a second project, Sustainable Management of Coastal and Marine Protected Areas, commissioned by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (completed in 2017). In Bangladesh, GIZ is currently supporting the Management of Sundarbans Mangrove Forests for Biodiversity Conservation and Increased Adaptation to Climate Change Project. This project aims to strengthen the institutional and organisational conditions for collaborative management of the Sundarbans supporting SMART patrolling. The GIZ-funded Coastal Livelihoods Adaptation Programme, completed in 2016[181], aimed to increase climate resiliency and reduce disaster risk in coastal communities.

USA

In India, USAID's Sustainable Landscapes programme aims to reduce emissions and enhance carbon sequestration through India's forests. The 5-year Partnership for Land Use Science (Forest-PLUS) programme will facilitate an enabling environment and strengthen capacity for REDD+ implementation in India. USAID works with the Bangladeshi Government to respond and adapt to climate change and mitigate its effects on the most vulnerable populations in alignment with the US Government's Global Climate Change Initiative. USAID is active in the Sundarbans, working on environmental protection and livelihood support; its Bagh programme aims to protect tigers and their forested habitat in the West Sanctuary.

In Nepal, USAID supports targeted communities to adapt to adverse climate change impacts through its Initiative for Climate Change Adaptation[182]. This complements the US Government's Feed the Future Initiative, which aims to sustainably improve the food security of smallholder farmers. USAID has implemented the EUR 23 million, 5-year Hariyo Ban project in collaboration with WWF-Nepal. The project aims to reduce threats to the country's vast physical and biological diversity through interventions in two critical biodiverse areas covering over a third of the country: the Terai Arc Landscape and the Chitwan-Annapurna Landscape.

Similar to other programmes in Pakistan, USAID's major areas of work include the following priority sectors: energy, economic growth, stabilisation, education and health. Although it still operates many individual projects (70 in 2016), this is substantially fewer than previous years (150 in 2015). Roughly 2 % (USD 14 million) of the projected budget for 2017 (USD 742 million) has been allocated for environment.[183]

USAID has no environment programmes in Sri Lanka.

Austria

The Austrian Development Cooperation prioritises the Himalaya-Hindu Kush region, where it works with bi- and multilateral donors such as Finland, Germany, the Netherlands, Norway, Sweden and Switzerland, as well as several UN organisations and the ICIMOD regional programme. The partially Austrian-funded Environmental Change and Ecosystem Services programme is aimed at sustaining biodiversity and the capacity of ecosystems.[184] In Bhutan, support will continue to go to the energy, tourism and governance sectors.

In the Sundarbans in Bangladesh, under the CBD LifeWeb Initiative, the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management funded the Project for Establishing an Effective Protected Area Network for Threatened Freshwater Dolphins in the Waterways of the Sundarbans Mangrove Forest. Austria has provided assistance to Pakistan in the past, but allocations have been typically small, and in 2014 were exceeded by repayments.

Japan

JICA is an important bilateral donor in all countries of the sub-region, providing both technical and development assistance. It supports cooperation on nature conservation and climate change through sustainable forest management, sustainable utilisation of natural resources for improvement of livelihoods in vulnerable communities, and biodiversity conservation through the management of protected areas and surrounding buffer zones. JICA's cooperation policy[185] is focused on two broad components: (i) promotion of biodiversity conservation and the sustainable use of its components, and (ii) generation of 'co-benefits' for biodiversity conservation and climate change mitigation/adaptation (REDD+)[186]. In Bhutan, JICA's support is aimed at strengthening local governance. In India, JICA has biodiversity conservation and forest management projects in Sikkim, Gujarat and Nagaland through the 'Biodiversity conservation and forest management project'. JICA is engaged in Bangladesh in infrastructure improvement and the management of water, power and transport.[187]

UN agencies

The UN-REDD[188] Programme, jointly implemented by the United Nations Environment Programme (UNEP), the **Food and Agriculture Organisation of the United Nations** (FAO) and the **United Nations Development Programme** (UNDP), provides assistance to all six countries. UNEP's support for the environment in Nepal is largely focused on climate change adaptation and mitigation. A joint initiative of UNEP and UNDP, funded by the GEF's Least Developed Countries Fund, aims to identify technical, institutional and financial needs to integrate climate change adaptation into ongoing medium and long-term national planning and budgeting in least developed countries, and strengthen their institutional and technical capacities for National Adaptation Plans. In Bangladesh and Bhutan, the UNEP-UNDP Poverty-Environment Initiative supports country-led efforts to integrate the twin priorities of poverty reduction and environmental sustainability into sectoral, national and sub-national development plans, policies, budgets, and monitoring and evaluation systems.

In all countries within the sub-region, UNDP is primarily involved in promoting environmental sustainability, renewable energy, climate resilience and disaster risk management. In the Western Ghats, UNDP is engaged in the project 'Developing an effective multiple-use management framework for conserving biodiversity in the mountain landscape of the high ranges, Western Ghats' (2014–2018). UNDP's goals and activities in Pakistan include working with national and provincial governments to formulate national strategies and policies for strengthening community mobilisation, assisting early recovery from disasters and internal displacements, improving environmental and climate change management, and advocating and supporting equitable income-generation policies. In Sri Lanka, UNDP supports community forestry management, a capacity-building programme to strengthen skills in order to control the introduction and spread of alien invasive species. In Nepal, much of UNDP support has gone to building up the capacity of government agencies, civil society and community groups to fight poverty, and to bringing these groups and Nepal's donors together to design and implement successful poverty-alleviation projects in alignment with the Sustainable Development Goals. In Bhutan, UNDP played an important role in helping establish the Bhutan Trust Fund for Environmental Conservation, an independent grant-making organisation that uses its annual investment income to finance conservation activities.

(178) http://www.unodc.org/brussels/en/unodc-cites-asia-wildlife-enforcement-and-demand-management-project.html
(179) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/412393/Pakistan-summary.pdf
(180) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/515724/iwt-challenge-project-list.pdf
(181) https://www.giz.de/projektdaten/projects.action?request_locale=en_EN&pn=201198324
(182) Developed by a Nepal-based international NGO called International Development Enterprises and its local partners Rupantaran and Resource Identification and Management Society Nepal.
(183) http://beta.foreignassistance.gov/explore/country/Pakistan
(184) http://www.entwicklung.at/en/countries-and-regions/himalaya-hindu-kush/
(185) JICA. Achieving poverty alleviation through biodiversity conservation. Available at http://www.jica.go.jp/english/our_work/thematic_issues/environment/pdf/position_paper_01.pdf
(186) REDD is Reducing emissions from deforestation and forest degradation, while REDD+ is REDD with the addition of the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.
(187) http://www.jica.go.jp/bangladesh/english/activities/c8h0vm00004b20nh-att/051_Bangladesh-e.pdf
(188) http://www.un-redd.org/

Bardia National Park, Nepal, is close to the international border and the Katerniaghat Wildlife Sanctuary in India. There are opportunities for international cooperation to create transboundary habitat corridors linking the two sites.

UNDP's Biodiversity Finance Initiative (BIOFIN)[189], launched in 2012, is a global partnership addressing the biodiversity finance challenge, enabling countries to measure their current biodiversity expenditures, assess their financial needs in the medium term and identify the most suitable finance solutions to bridge their national biodiversity finance gaps. BIOFIN is active in 31 countries worldwide, including Bhutan, India and Sri Lanka.

Multilateral development banks

In India, the **World Bank** supported the Biodiversity Conservation and Rural Livelihoods Improvement Project (2010–2015) to develop and promote new models of conservation at the landscape scale, through enhanced capacity and institution building for mainstreaming biodiversity conservation outcomes. The two project sites were Little Rann of Kutch and Askot in Uttarakhand. The Integrated Coastal Zone Management programme (EUR 220 million, 2010–2015) built up national capacity for the implementation of a comprehensive coastal management approach in the country, and piloted the integrated coastal zone management approach in the states of Gujarat, Orissa and West Bengal (the Sundarbans was a target site). The World Bank regional project Strengthening Regional Cooperation for Wildlife Protection in Asia aims to assist the participating Governments of Bhutan, Bangladesh and Pakistan to enhance shared capacity, institutions, knowledge and incentives to collaborate and tackle illegal wildlife trade and other selected regional conservation threats to habitats in border areas. Some of the sub-projects are addressing human-wildlife conflict through engagement with the local communities and civil society. India has bilateral Memoranda of Understanding relating to wildlife and ecosystems in cooperation with Bangladesh, Bhutan and Nepal, and is expected to collaborate to further the project's goals of protecting regional biodiversity.

The **Asian Development Bank**'s **(ADB)** assistance is largely focused on climate-resilient development initiatives (Bhutan)[190], promoting a transition towards environmentally sustainable infrastructure and green growth (Nepal)[191], infrastructure development and institutional reforms (Pakistan)[192], strengthening the country's safeguarding systems (Sri Lanka)[193], good governance and capacity development in Bangladesh, mainstreaming climate change mitigation and adaptation, and ensuring environmental and social sustainability of infrastructure investments in India[194].

Multi-donor funds and initiatives

The **Critical Ecosystem Partnership Fund (CEPF)** disbursed around EUR 4.6 million in grants to civil society organisations for conservation work in the Western Ghats between 2008 and 2015. In the Eastern Himalayas, a CEPF programme disbursed about EUR 3 million in 32 grants to CSOs between 2005 and 2010. Supported by the German Government, the German Development Bank (KfW) and IUCN launched the **Integrated Tiger Habitat Conservation Programme (ITHCP)** in 2014. ITHCP is a strategic funding mechanism, which aims to save tigers and their habitats. The programme contributes to the international goal set up during the 2010 St Petersburg Tiger Summit to double wild tiger populations by 2022 (up to 6 000 tigers), starting from a baseline global population of 3 200, which was the IUCN Red List population estimate at that time. The ITHCP has a current portfolio of 11 projects located within tiger conservation landscapes, six of them in the South Asia region. Up to mid-2017, EUR 16 million had been committed by IUCN-KfW for these sites.[195]

The **Global Environmental Facility (GEF)** is one of the largest investors in biodiversity conservation across the sub-region through both biodiversity and climate change-dedicated funding. Since 2006, 24 GEF projects covering the priority regions in the six countries have addressed biodiversity conservation, representing a total GEF investment of EUR 56.83 million[196], leveraging EUR 166.78 million in co-financing. GEF is now in its sixth funding cycle (2014-2018), with a total allocation for the six countries of the South Asia sub-region of EUR 165 million, with 61 % (EUR 100 million) allocated for climate change and 31 % (EUR 50 million) for biodiversity; the balance, 9 % (EUR 14 million) is for land degradation. The largest overall GEF allocation is to India (EUR 117 million, with EUR 33 million for biodiversity conservation). Biodiversity allocations are EUR 1.8 million for Bangladesh, EUR 1.8 million for Bhutan, EUR 3 million for Nepal, EUR 4.5 million for Pakistan and EUR 6.4 million for Sri Lanka.

The **Global Tiger Initiative** is a joint initiative of the GEF, the Smithsonian Institution, Save the Tiger Fund and the International Tiger Coalition. The **Global Tiger Recovery Programme** (2010) and the **Global Snow Leopard and Ecosystem Protection Programme** (2013) unite 20 governments and their partners in a high-profile collective action to conserve these apex predators and their landscapes in Asia. Both programmes are implemented by country governments and coordinated by the respective programme secretariats.

(189) http://www.biodiversityfinance.net/homepage
(190) Asian Development Bank. Bhutan Country partnership Strategy. Environment Assessment Summary, 2014–2018.
(191) Asian Development Bank (2014). Country Environment Note. Nepal.
(192) https://www.adb.org/sites/default/files/publication/27786/pak-2015.pdf
(193) Asian Development Bank (2014). Country Environment Note. Sri Lanka.
(194) Asian Development Bank Environment Assessment: India. Country Partnership Strategy: IND, 2013–2017.

(195) http://www.iucn.org/theme/species/our-work/action-ground/integrated-tiger-habitat-conservation-programme
(196) Data from https://www.thegef.org/gef/country_profile?countryCode=TH&op=Browse&form_build_id=form-x5-HGSEi1AXLS4jCRhnwuG-zubkoqvVIpK2JzEhDL4o&form_id=selectcountry_form, accessed 3 March 2016.

4

Lessons learned

The Western Ghats play a key role in India's weather because they lie across the path of the south-west monsoon winds. They are also the home of unique and threatened species. Although the forests and wetlands of the region are under severe pressure, it is the location of important initiatives to protect biodiversity and enable people and wildlife to co-exist.

4 _ Lessons learned

Conservation in the South Asia region has made rapid advances over the past two decades. In the coming years, the region will continue to experience accelerating economic growth and steady success in poverty alleviation. This dynamic context simultaneously poses complex challenges and emerging opportunities for biodiversity conservation.

4.1 Protected areas

A quarter of the land inside South Asia's protected areas is classified as human modified, with habitat conversion rates in PAs often indistinguishable from those for unprotected lands.[197,198] Several protected areas in the region have been degraded and lost key species of wildlife due to poaching.[199] It is therefore critically important to focus on addressing direct threats to protected areas, such as poaching, human-wildlife conflict and land-use change. Low investments in PA management and protection, both historically and recently, are largely responsible for the state of protected areas in the region.

Key lessons and promising approaches for protected areas in South Asia are described below.

- The deployment of efficient site-based law-enforcement monitoring systems (M-STrIPES[200] and SMART[201]), linking field data and geospatial information to make ground patrols more effective and accountable, is useful to improve protection.
- A focus on increasing prosecution and conviction rates could lead to greater success in dismantling trade networks.
- Tackling human-wildlife conflict is critical to effective PA management, because the conflict promotes opposition to PAs. Emerging approaches such as SAFE[202] ensure that all six elements of conflict (prevention, mitigation, response, research, policy and monitoring) are addressed. Effective early warning systems and compensation policies are also important tools to manage conflict. Enforcement of strict buffer zones, and contributing to addressing the social issues which bring people into conflict with wildlife (such as landlessness) are critical to the future of wildlife in the densely populated landscapes of the South Asia region.
- Using guidance that is already available[203] will enable PA managers to use a wider range of tools and approaches to address the challenges they face, and so raise standards of PA management in the region.
- In some PAs, support to existing community-based organisations, or the creation of new ones, is a key strategy for engaging with local populations. Effective local community-based organisations can have the capacity to manage and protect natural resources inside protected areas. An example can be found in in Pakistan's Khunjerab National Park where communities work together with park staff to implement sustainable land management that is compatible with conservation goals and local livelihoods. Given how remote and inaccessible some protected areas are, especially in the high mountains of this region, examples of the successful direct involvement of local people in protected area management should be considered an integral part of protected area development.

4.2 Landscape-scale approaches to conservation

While protected areas remain critically important for biodiversity conservation, they are becoming increasingly vulnerable and isolated within human-dominated landscapes, with land use and development pressures eroding weakly enforced boundaries. Securing land outside the formal protected area system, including in buffer zones, corridors, community-conserved areas and production landscapes, is essential to the long-term conservation of biodiversity.[204] Landscape-scale approaches will be vital to save biodiversity in human-dominated landscapes.

A number of policy-based and incentive-linked approaches aimed at increasing the conservation value of land outside the protected area systems are currently being piloted in the region.

(197) Symes W.S., M. Rao, M.B. Mascia and L. Roman Carrasco (2015). Why do we lose protected areas? Analysis of factors influencing protected area downgrading, downsizing and degazettement in the tropics and sub-tropics. Global Change Biology 22, pp. 656–666.
(198) Clark N., E.H. Boakes, P.J.K. McGowan, G.M. Mace and R.A. Fuller (2013).). Op. cit.
(199) Juffe-Bignoli D., S. Bhatt, S. Park, A. Eassom, E.M.S. Belle, R. Murti, C., Buyck, A. Raza Rizvi, M. Rao, E. Lewis, B. MacSharry and N. Kingston (2014). Asia Protected Planet Report 2014. UNEP-WCMC, Cambridge, UK.
(200) M-Stripes – Monitoring System for Tigers. Intensive Protection and Ecological Status. http://admin.indiaenvironmentportal.org.in/files/mstripes-ppt.pdf
(201) SMART (Spatial Monitoring and Reporting Tool). http://smartconservationtools.org/
(202) WWF TAI (2015). Human Wildlife Conflict a SAFE Approach, WWF Tigers Alive Initiative. http://zeropoaching.org/pdfs/HWC_concept_note.pdf
(203) Appleton M. (2016). A Global Register of Competences for Protected Area Personnel. IUCN WCPA. Protected Area Technical Series Report No 2. https://portals.iucn.org/library/node/46292
(204) Rangarajan M., M.D. Madhusudhan, G. Shahabuddin. Orient Blackswan (Eds.) (2014). Nature without Borders.

Long-billed vulture. Long-billed and slender-billed vultures were abundant in India and Pakistan, but declined dramatically in the mid-2000s, poisoned by veterinary drugs ingested via livestock carcasses. Alternative drugs, education and advocacy have slowed the decline, and captive populations have been established to re-stock wild populations when it is safe to do so.

Section 3 described the creation of categories such as protected forests (Nepal), conservation and community reserves (India), community conservation areas (Pakistan), and ecologically sensitive/critical areas (India/Bangladesh) as promising approaches to secure lands outside PAs for conservation.

4.3 Appropriate policy and legislative frameworks

Appropriate policy and legislative frameworks are key to making Payments for Ecosystem Services (PES) schemes work for wildlife conservation. Valuation of the ecosystem services provided by forests, watersheds, wildlife and protected areas is a first step in implementing green accounting, and is gaining momentum across the region.[205] However, the extent to which economic valuation has influenced economic decisions about natural resources is not adequately documented. A lack of understanding of PES mechanisms and limited capacity for effective design and implementation are limiting the scaling-up and replication of these schemes across the sub-region. PES schemes may be complex, involving consideration of equity and trade-offs between conservation goals and other agendas across multiple scales, but they can work within a context of clear and enforceable land tenure/property rights.[206]

In the southern part of the Western Ghats in India, a PES project aims to restore ecological connectivity and thereby ensure long-term population viability of mammal populations. The project works by incentivising wildlife-friendly land-use practices.[207] Individual landholders in critical corridor areas are encouraged to restore understorey vegetation and to remove barriers to animal movement, such as electric fences, while indigenous communities are paid to monitor wildlife movement through traditionally used forest areas. The economic benefits delivered to the local communities are providing them with livelihood alternatives to unsustainable exploitation of natural resources. Also in the Western Ghats, a number of innovative, market-based mechanisms at small spatial scales are increasingly yielding positive results. These approaches include the certification of tea, coffee and rubber from plantations that adopt sustainable agricultural practices in collaboration with Rainforest Alliance and Sustainable Agriculture Network.[208] Certification of sustainably harvested medicinal plants and herbs have also shown promise, with local communities encouraged to protect natural resources on privately owned lands without legal protection.[209,210] With support from the German Federal Ministry of Economic Cooperation and Development, the Keystone Foundation and Barclays Bank, tribal farmers and non-timber forest product gatherers have set up a company focused on adding value to agricultural and forest produce. The initiative is reinforcing civil society networks through knowledge- and coalition-building on the challenges of mining, deforestation and specific mini hydro projects.[211]

4.4 Co-management of natural resources

Biodiversity conservation in human-dominated landscapes is inextricably linked with communities living within and outside protected areas. These are the people who utilise, impact and are affected by the biodiversity. Mechanisms such as community conservation areas (CCAs) are an opportunity to expand the area of protected areas and at the same time facilitate community management of natural resources. The complex

(205) Verma M., D. Negandhi, C. Khanna, A. Edgaonkar, A. David, G., Kadekodi, R. Costanza and R. Singh (2015). Economic Valuation of Tiger Reserves in India: A Value+ Approach. Indian Institute of Forest Management. Bhopal, India. January.
(206) Vira B., J. Krishnaswamy, S. Badiger and C. Kumar (2012). Negotiating trade-offs. Choices about ecosystem services for poverty alleviation. Economic and Political Weekly Vol. XLVII, pp. 67–76.
(207) http://legacy.cepf.net/news/top_stories/Pages/FERAL-project-Western-Ghats.aspx
(208) Ram S., F. Abraham and S. Vaidyanathan (2015). Market for eco-certified rubber and rubber wood in India. Final Technical Report. Foundation for Ecological Research, Advocacy and Learning, Puducherry, India.
(209) http://www.fairwild.org/activities/
(210) http://www.pukkaherbs.com/pukka-planet/stories/planet/maharashtra/
(211) ATREE and CEPF (2013). Five-year Assessment of the CEPF Investment in the Western Ghats Region of the Western Ghats and Sri Lanka.

nature of forest and natural resource governance means, however, that there is no single solution that applies in all situations.[212,213] The effectiveness of CCAs in achieving biodiversity conservation and sustainable economic benefits for communities has been patchy.[214,215] The mechanism of *joint forest management* in India enlists the support and cooperation of local communities in forest regeneration. The approach gives local people access to a demarcated forest area near their village for the collection of plant products and biomass, in return for them assuming responsibility for its protection and regeneration. While there is considerable evidence that joint forest management has contributed to the regeneration of *dipterocarp* forests, biological diversity remains low, due to over-exploitation.[216] In Bangladesh, the scope for community-based sustainable management of the Sundarbans fisheries is limited due to the large number of stakeholders involved and resource limitations.[217]

Co-management has the best chance of success for livelihoods and biodiversity when supportive political, economic and social conditions are in place. Recognising this is critical to the design of sustainable participatory management models, which can be scaled up in the long term. Working with communities on locally developed solutions rather than imposing external solutions is more likely to be effective.[218] Ultimately, it is crucial to recognise that win-win scenarios for poverty alleviation and biodiversity conservation are rarely possible and that trade-offs may have to be negotiated.

Pakistan is a special case in community management, because of its unusual combination of tribal resource ownership in some regions, coupled with the government's devolution of resource management responsibilities. This has led to the implementation of a host of co-management initiatives. Many of those that are well supported by government and external sources are successful, but all of them are site-based and local, and there is a need to scale-up promising initiatives across larger landscapes. Community forestry in Nepal through the *community forest-user groups* represents one of the most successful decentralised modes of forest governance in the region.[219] The programme is widely believed to have led to improvements in forest cover. There are challenges, including how to make forest-user groups more equitable and inclusive. More attention needs to be paid to institutional strengthening, as well as improving the conditions necessary for long-term institutional effectiveness.[220]

4.5 Infrastructure, extractive industry and energy sectors

Large-scale expansion of linear infrastructure (roads, railway lines, waterway development), extractive industry (mining, oil exploration) and energy production (dams, power plants) can be expected to transform landscapes over the next 5 to 10 years. Mitigating the impact of these developments is essential for biodiversity conservation. Implementation of strong regulatory frameworks that mandate the adoption of strict biodiversity and environmental safeguards into development planning will be critical to prevent irreversible losses in biodiversity.

The development of 'green infrastructure' will become increasingly relevant as a proactive mechanism to reconcile development with ecological impacts.[221,222] Biodiversity offsets represent an important aspect of mitigating impacts of infrastructure development in protected areas. In many countries there are policies that require or provide some guidance to offsets but the legal frameworks are not yet in place to facilitate compliance regarding the principles of biodiversity offsetting.[223] Ongoing evaluations of offsetting clarify the risks involved and the potential for positive conservation impact.[224,225]

4.6 Institutional strengthening to tackle the illegal wildlife trade

The commercially lucrative illegal wildlife trade poses a serious threat to the persistence of endangered wildlife across the region.[226] The current global political climate for addressing these issues is highly favourable. However, efforts to translate this opportunity into solid action are hampered at national level by weak capacity and persistent corruption, and at international level by a lack of reliable information to mobilise and motivate international enforcement actions.

Tiger caught in snare, India. Collaborative efforts by wildlife and law enforcement agencies, communities and customs officials have led to some successes, but these efforts need to be intensified to address the scale of the illegal wildlife trade.

All the countries in the region have an agency mandated to enforce existing laws on wildlife poaching and trafficking. However, they typically lack resources and political support, may suffer from corruption, and lack adequately qualififed and motivated staff. These problems lead to ineffective law enforcement and low prosecution and conviction rates. Regional networks such as SAWEN and SLAWEN have the potential to facilitate better international coordination, but they also suffer from weaknesses in national frameworks and institutions, and currently lack the momentum needed to achieve their objectives. Partnerships between CSOs and government enforcement agencies have proved to be essential for tackling wildlife crime, but political will is also critical to raise the profile of the trafficking problem and to implement effective solutions.

Tackling wildlife crime effectively requires dismantling international networks using intelligence-based approaches to law enforcement, and strengthening prosecution and conviction rates.[227] Some intelligence-led approaches are being initiated in countries such as India where the authorities have successfully dismantled tiger and pangolin poaching and trade networks.[228] Successful approaches in other regions include the Wildlife Crime Unit approach in Indonesia.[229] In Nepal, coordinated law enforcement and effective engagement of local communities led to reduced poaching of rhino and established a successful conservation model for commercially valuable species.[230,231] The cooperation of Nepal's own government departments, help from conservation NGOs and commitment from local people living near the boundaries of the three protected wildlife areas contributed to successful implementation of law enforcement by multiple agencies. CCAs in Gilgit-Baltistan, Pakistan have over 100 community rangers providing wildlife monitoring and enforcement, but the mechanisms for supporting these activities do not yet have sufficient internal funding.

4.7 Species recovery programmes[232]

Relatively high investments are focused on the protection of charismatic species, such as elephant, tiger, rhino and snow leopard, and their habitats. An assumption is that protecting these species and their habitats will also help conserve other, lesser-known species. However, across the region, recovery programmes for threatened and neglected taxa, such as freshwater fish, pangolin, river turtle, primates, frogs, small carnivores and water birds, are urgently in need of investment and support. India has developed recovery programmes for critically endangered species and habitats. Bangladesh has made a particularly strong commitment to protect vulture, crocodile, turtle, migratory birds and freshwater dolphin by explicitly incorporating the conservation needs of these species into management plans and establishing new protected areas in their core habitat.

The sub-region has a few strong working models of threatened species conservation, and there is a need to replicate these models and bolster new strategies for lesser known, yet highly threatened, species. *India's Rhino Vision 2020* aims to attain a population of 3 000 Indian rhino across seven of its protected areas by 2020 using a multi-pronged strategy of protection, translocation and monitoring.[233] Recovery programmes are planned for the great Indian bustard[234], turtles[235], vultures[236] and white-bellied heron[237], but greater support is needed for international coordination and implementation.

(212) Lele S. and A. Menon (Eds.) (2014). Democratizing Forest Governance in India, Oxford University Press, New Delhi. 424 pp.
(213) Ostrom E., M. Janssen and M.A. Anderies (2007). Going beyond panaceas. Proceedings of the National Academy of Sciences 104(39), pp. 15176–15178.
(214) Neema P.B., S. Bhutani, R. Rajagopalan, S. Desor and M. Vijairaghavan (2012). An analysis of international law, national legislation, judgements, and institutions as they interrelate with territories and areas conserved by indigenous peoples and local communities. India. Report No 13.
(215) Shahabuddin G. and M. Rao (2010). Do community-conserved areas effectively conserve biological diversity? Global insights and the Indian context. Biological Conservation 143, pp. 2926–2936.
(216) Shahabuddin G. (2010). Does the community care? Community forest management in Mendha (Lekha). In Conservation at the Crossroads, Science, Society and the Future of India's Wildlife. Permanent Black, Delhi.
(217) USAID-IPAC Project 2010. Study on the conservation and management of Fisheries Resources. Draft by International Resources Group (IRG).
(218) http://www.bt.undp.org/content/bhutan/en/home/presscenter/articles/2015/06/23/rubesa-farmers-take-on-human-wildlife-conflict-with-local-innovation/
(219) Nagendra H., M. Karmacharya and B. Karna 2005. Evaluating forest management in Nepal: views across space and time. *Ecology and Society* 10(1), p. 24. Online at http://www.ecologyandsociety.org/vol10/iss1/art24
(220) Kumar N. (2002). Challenges of community participation in forest development in Nepal. World Bank. Operations Evaluation Department Working Paper.
(221) Quintero J., R. Roca, A.J. Morgan and A. Mathur (2010).Smart green infrastructure in tiger range countries. World Bank, Washington DC. http://documents.worldbank.org/curated/en/659031468023351501/Smart-green-infrastructure-in-tiger-range-countries-a-multi-level-approach
(222) Wildlife Institute of India (2015). http://www.indiaenvironmentportal.org.in/content/424875/eco-friendly-measures-to-mitigate-impacts-of-linear-infrastructure-on-wildlife/
(223) Divya Narain (2011). A Case for Biodiversity Offsets in India: From Biodiversity Risk to Competitive Advantage. . http://www.forest-trends.org/documents/files/doc_3155.pdf
(224) IUCN (2014). Biodiversity Offsets Technical Study Paper. IUCN, Gland, Switzerland. 65pp.
(225) Pilgrim J.D. and L. Bennun (2014). Will biodiversity offsets save or sink protected areas. Conservation Letters, September/October 2014, 7(5), pp. 423–424.

(226) European Commission (2016). EU Action Plan against wildlife trafficking. http://ec.europa.eu/environment/cites/pdf/WAP_EN_WEB.PDF
(227) Wright B. Wildlife Protection Society of India, Pers. comm..
(228) Wildlife Protection Society of India. www.wpsi.org
(229) Wildlife Crimes Unit in Indonesia is a unique partnership between civil society and government authorities to tackle wildlife crime by increasing prosecution and conviction rates. http://pdf.usaid.gov/pdf_docs/PA00KH52.pdf
(230) Martin E.B., C. Martin and L. Vigne (2013). Successful reduction in rhino poaching in Nepal. Pachyderm 54, pp. 66–73.
(231) Nepal's wildlife conservation success. https://www.usaid.gov/sites/default/files/documents/1861/Page%2011.pdf
(232) IUCN Red List categories of critically endangered, endangered, vulnerable species. www.iucnredlist.org
(233) Department of Environment and Forests, Government of Assam. Indian Rhino Vision 2020.
(234) http://re.indiaenvironmentportal.org.in/files/file/GIB%20Species%20Recovery%20Plan.pdf
(235) http://www.turtlesurvival.org/component/taxonomy/term/summary/19/45#.WBrCTeF968U
(236) http://www.save-vultures.org/
(237) https://www.synchronicityearth.org/taking-steps-to-protect-the-critically-endangered-white-bellied-heron/

5

Strategic approaches

Greater flamingos and other waterbirds, Keolodeo National Park, India. The park is a World Heritage Site and a Ramsar site. Its international status helps to attract over 140 000 visitors annually, supporting local accommodation and tourism businesses.

5 _ Strategic approaches

5.1 Priority geographies

Biodiversity and ecosystems are not distributed evenly across South Asia. While the identification of priority regions for conservation (see section 1.2.4) provides one approach to the identification of the most important parts of this huge area, the areas identified are very large – the whole of Nepal, Bhutan and Sri Lanka are included within priority regions for conservation, for example. To provide a more focused analysis of priorities, key landscapes for conservation (KLCs) are identified to highlight landscapes that are most important for biodiversity conservation. KLCs should be considered priorities for funding of conservation-related actions, and should also be areas where potentially damaging projects (particularly infrastructure and large-scale land-use change) should be subject to additional scrutiny for biodiversity impacts.

5.1.1 Defining KLCs in South Asia

The identification of KLCs relies on available data at a suitable scale of analysis. There is no single analysis that can be applied across the South Asia region, and so the KLCs identified here are based on a compilation of published analyses at a relevant scale. These include (i) WWF Global 200 Ecoregions, (ii) WWF tiger landscapes, (iii) tiger source sites, (iv) snow leopard ranges (as identified by WCS and GSLEP), (v) WCS Asian elephant ranges, (vi) endemic bird areas, and in some cases (vii) groups of large important bird areas (IBAs), and (viii) key biodiversity area (KBA) corridors identified by CEPF (Table 5.1).

The identification of KLCs is based on existing analyses, which in turn are based on the best available data. However, there are gaps in the data on species status and distribution. The KLC maps do not effectively capture linear ecosystems (e.g. rivers, mangroves) or fragmented ecosystems (e.g. karst), and so these habitats may not be adequately represented. This chapter has highlighted that wildlife crime is one of the most severe threats to biodiversity in the region. While the hunting/harvesting of biodiversity has a spatial dimension, the priorities for action are also in markets, population centres and international transit points, which are not captured by these maps.

Table 5.1 Data sources for KLC identification in South Asia

KLC name	Data source
Eastern Ghats	WWF: Eastern Ghats Landscape; Wildlife Conservation Society: Tiger source sites; elephant range
Gir Forest	BirdLife International: Gir National Park and Wildlife Sanctuary key biodiversity area
Nepal	Bird Conservation Nepal: Nepal important bird areas (single IBAs or groups of contiguous IBAs >1 500 km², smaller IBAs excluded)
North-east India and Bhutan	Critical Ecosystem Partnership Fund: KBA corridors
North-west India	BirdLife International: important bird areas (single IBAs or groups of contiguous IBAs >1 500 km², smaller IBAs excluded)
Pakistan	BirdLife International: western Himalayas endemic bird area, with outlying sections delineated using forest cover data from Hansen *et al*[i], WWF G200 Indus river delta, WWF G200 Arabian Sea, WWF G200 western Himalaya temperate forest, WWF G200 Tibetan plateau steppe, WCS snow leopard range, GSLEP snow leopard landscapes
Rann of Kutch	WWF Global 200 Ecosystem: Rann of Kutch Flooded Grasslands
Ranthambhore	WWF: western India tiger landscape; Wildlife Conservation Society: tiger source sites
Satpura Maikal	WWF: Satpura Maikal tiger landscape; Wildlife Conservation Society: tiger source sites
Sri Lanka	Wildlife Conservation Society: elephant range
Sunderbans	Wildlife Conservation Society: tiger source sites
Western Ghats	Wildlife Conservation Society: tiger source sites; Critical Ecosystem Partnership Fund KBA corridors; part of WWF Eastern Ghats Landscape

(i) Hansen M.C., P.V. Potapov, R. Moore, M. Hancher, S.A. Turubanova, A. Tyukavina, D. Thau, S.V. Stehman, S.J. Goetz, T.R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C.O. Justice and J.R.G. Townshend (2013). High-Resolution Global Maps of 21st Century Forest Cover Change. Science *342 (6160), pps.850-853. DOI: 10.1126/science.1244693*

Asiatic lion in Gir National Park, India. Around 350 of this unique sub-species of the African lion live in and around the park. Protection against poaching is critical for their survival, and establishment of a separate population has been recommended to guard against extinction as a result of a catastrophic event such as disease or fire.

5.1.2 KLCs in South Asia

There are 12 KLCs identified across the South Asia sub-region, covering a total area of 963 760 km² (Figure 5.1, Table 5.2). Seven of these KLCs lie entirely within India (Eastern Ghats, Gir Forest, north-west India, Rann of Kutch, Ranthambhore, Satpura Maikal and Western Ghats). There is one KLC in each of Nepal, Pakistan, Sundarbans (India and Bangladesh) and Sri Lanka, and one across north-east India and Bhutan. The largest KLC is the Eastern Ghats, with an area of 266 671 km².

South Asian KLCs cover a wide range of ecosystems and species, including the Himalayan mountains, deserts and tropical rainforest. Key species include tiger, one-horned rhinoceros and Asian elephant, but there is also a huge diversity of other mammals, plants and birds.

In total, there are 406 protected areas covering about 12 % of the area of KLCs in the region, a total of 119 897 km² (Figure 5.2, Table 5.3). Gir Forest and the Sundarbans have the highest level of formal protection, while the Eastern Ghats, Pakistan and Satpura Maikal KLCs are particularly poorly protected. Eastern Ghats has the lowest percentage of its area within protected areas (3.17 %).

5.2 Strategic approaches to addressing the main pressures on biodiversity and ecosystems

5.2.1 Secure protected areas and priority geographies for biodiversity conservation

High priorities should be strengthening the protection and management of existing protected areas through increased investments in monitoring, site-based law enforcement, staff capacity building and threat mitigation. This would contribute to achieving the UN Sustainable Development Goal (SDG) 15.[238] Protecting and restoring water-related ecosystems such as forests, mountains, wetlands and rivers are not only essential to protecting freshwater biodiversity but also to mitigating water scarcity, thus addressing UN SDG 6[239]. Securing protected areas

([238]) UN Sustainable Development Goal 15. Life on Land. Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss. http://www.un.org/sustainabledevelopment/biodiversity/

([239]) UN Sustainable Development Goal 6. Clean water and sanitation. http://www.un.org/sustainabledevelopment/water-and-sanitation/

Figure 5.1 Priority regions for conservation and key landscapes for conservation in South Asia

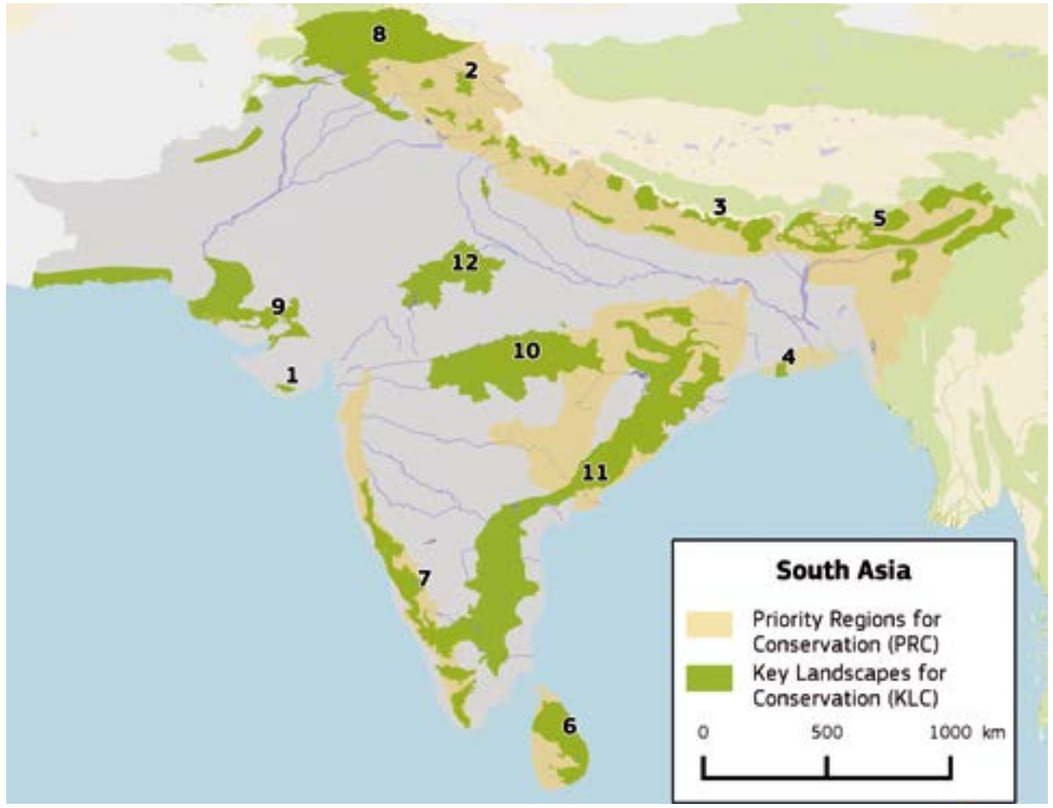


Table 5.2 List of KLCs in South Asia

Map	KLC group	Total area (km²)	Country (ISO code)	Special features
1	Gir Forest	1 716	IN	Large tracts of dry deciduous forest, thorny forest and savannah. Only remaining population of Asiatic lion persists in and around Gir forest. The Gir Wildlife Sanctuary is the most important protected area for the species.
2	North-west India	22 835	IN	Western Himalayan temperate forest; high altitude alpine meadow. Upper catchments of several important rivers; important areas for snow leopard, tragopan, tiger, Himalayan tahr. High levels of plant and animal endemism.
3	Nepal	31 230	NP	Sub-tropical broadleaved forest; temperate forest, bamboo jungle, coniferous forest, rhododendron forest, dry deciduous forest, grassland, savannah. Globally threatened birds and mammals including vulture, migratory birds, tiger, Himalayan tahr, greater one-horned rhinoceros. High levels of plant and animal endemism.
4	Sunderbans	2 516	BD, IN	Freshwater swamp forest, world's largest mangrove ecosystem, important source site for tiger, habitat for other species such as river shark and humpback dolphin, global stronghold for several critically endangered turtle and bird species.
5	North-east India and Bhutan	109 086	BT, IN	Naga-Manipuri-Chin Hills moist forest, Eastern Himalayan broadleaf and conifer forest, western Himalayan temperate forest, Terai-Duar savannah and grassland. Tiger source sites. Globally important populations of Asian elephant, one-horned rhino. High levels of endemism.
6	Sri Lanka	37 313	LK	Savannah woodland, grassland, moist forest. Asian elephant, and large numbers of endemic plants, birds.
7	Western Ghats	69 201	IN	Moist deciduous forest, semi-evergreen forest, dry deciduous forest, montane evergreen forest, secondary dipterocarp forest, Myristica swamp forest, Shola forest, freshwater/riverine ecosystems. High levels of plant, amphibian, reptile and fish endemism; largest Asian elephant population in the world; amongst the highest density of tiger in the world, including 10 tiger source sites.
8	Pakistan	225 781	PK	Arid conifer forest, temperate forest, montane conifer forest, alpine shrub and meadow, middle Asian montane woodland and steppe, Rann of Kutch flooded grassland, Tibetan plateau. Giant woolly flying-squirrel, snow leopard, markhor; large extensions of the Rann of Kutch saltwater marsh habitat; globally important populations of many threatened wild ungulate species.
9	Rann of Kutch	23 842	IN	Flooded grassland, seasonal salt marshes provide refuge for the Indian sub-species of Asiatic wild ass and supports one of the world's largest breeding colonies of the greater and lesser flamingos.
10	Satpura Maikal	117 913	IN	Tropical dry forest, moist deciduous forest, dry deciduous scrub forest. Four important protected areas are all tiger source sites: Bandhavgarh, Kanha, Pench and Melghat.
11	Eastern Ghats	266 671	IN	Unique plant taxa and high levels of plant endemism; Simlipal tiger source site and important elephant range habitats in south Orissa; Boudh-Nayagarh; Mayurbhanj (Simlipal-Hadgarh-Kuldiha-Anantpur), south-west Bengal-Dalma-Singbhum and Sambalpur and Mahanadi elephant ranges.
12	Ranthambhore	55 651	IN	Dry deciduous forest, ravine and thorn forest. Important source site for tigers and habitat for the critically endangered great Indian bustard, gharial, Gangetic river dolphin, red-crowned roofed turtle. Chambal sanctuary is a corridor for the movement of tigers from the source population of Ranthambhore Tiger Reserve to the protected areas of Kuno-Palpur, Madhav National Park and Darrah-Mukundra.
Total		963 760		

Figure 5.2 Priority regions for conservation, key landscapes for conservation, and protected areas (IUCN categories I to IV) in South Asia

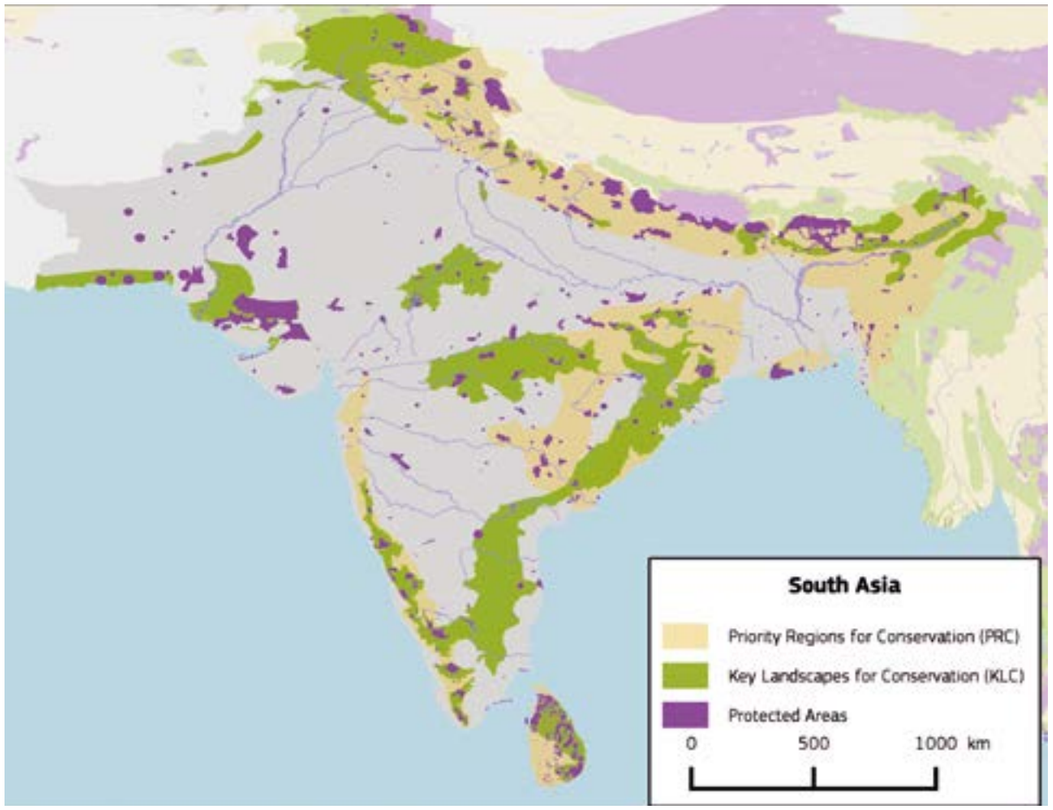
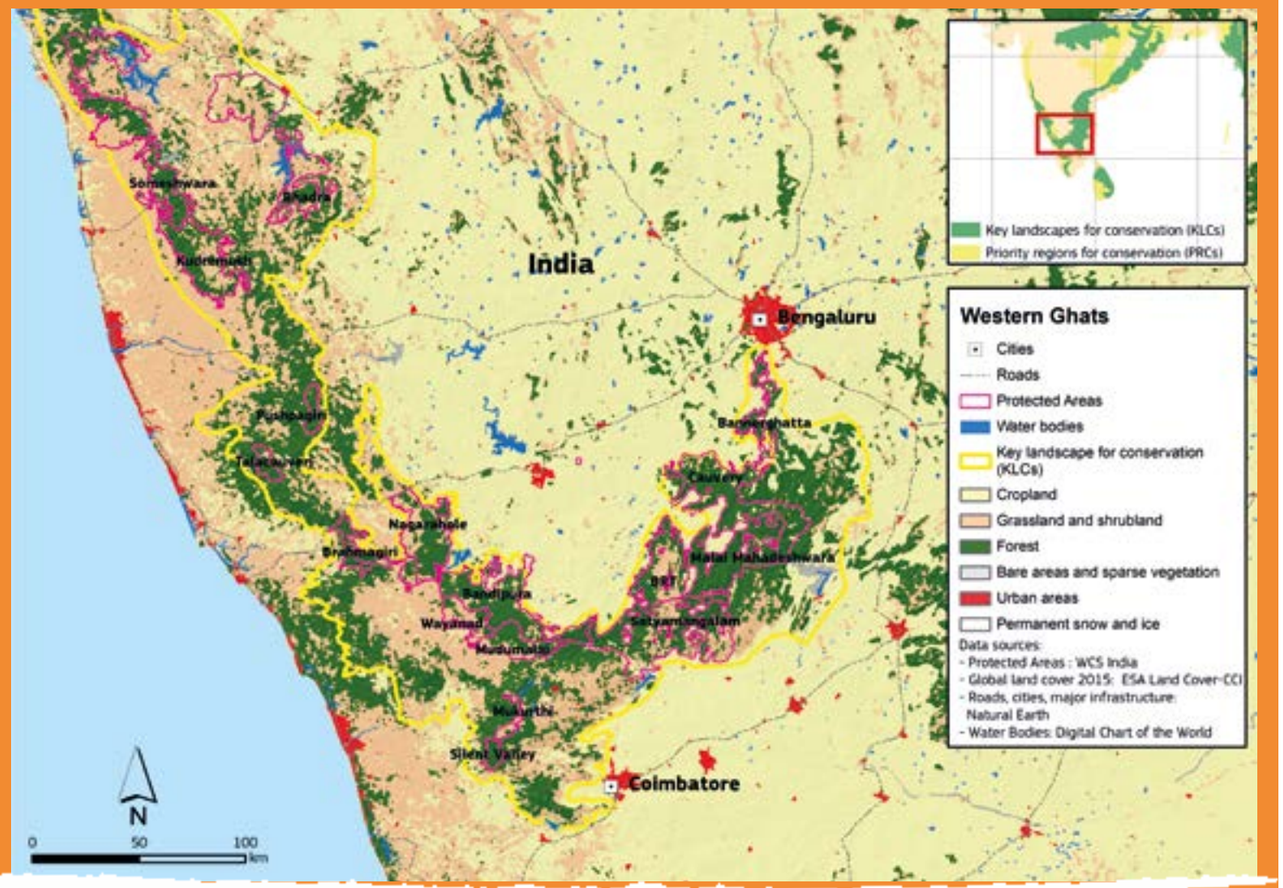


Table 5.3 Protected area coverage of KLCs in South Asia

Map #	KLC group	Area covered by protected areas (km²)	% of KLC area covered by protected areas	Total number of protected areas	Important protected areas
1	Gir Forest	1 716	100 %	1	Gir National Park, Gir Wildlife Sanctuary
2	North-west India	9 049	39 %	16	Nanda Devi National Park, Great Himalaya National Park, Pin Valley National Park, Govind Pashu Vihar National Park, Hemis National Park
3	Nepal	10 856	34 %	8	Chitwan National Park, Shuklaphanta Wildlife Reserve, Bardiya National Park, Api Nampa Conservation Area, Shey Phoksundo National Park, Annapurna Conservation Area, Manaslu Conservation Area, Langtang National Park, Sagarmatha National Park, Kanchenjunga Conservation Area
4	Sunderbans	2 171	86 %	3	Sundarbans West Wildlife Sanctuary, Sundarbans South Wildlife Sanctuary, Sundarbans East Wildlife Sanctuary, Chandpai Dolphin Sanctuary, Dhangmari Dolphin Sanctuary, Dudhmukhi Dolphin Sanctuary, Sundarbans National Park
5	North-east India and Bhutan	18 221	16 %	35	Kaziranga National Park, Manas Tiger Reserve, Pakke Tiger Reserve, Namdapha National Park, Eaglenest Wildlife Sanctuary, Dibang Wildlife Sanctuary, Jigme Dorgi National Park, Royal Manas National Park, Jigme Singye Wangchuck National Park, Sakteng Wildlife Sanctuary, Bundeling Wildlife Sanctuary
6	Sri Lanka	15 512	41 %	241	Yala National Park, Udawalawe National Park, Galoya National Park, Wasgamuwa National Park, Wilpattu National Park, Horton Plains National Park, Peak Wilderness Sanctuary, Knuckles Forest Reserve, Victoria Randenigala Rantembe Sanctuary
7	Western Ghats	12 227	17 %	32	Kali Tiger Reserve, Bhadra Tiger Reserve, Kudremukh National Park, Nagarahole Tiger Reserve, Bandipur Tiger Reserve, Wayanaad Tiger Reserve, Mudumalai Tiger Reserve, Sathyamangalam Tiger Reserve, Biligiri Rangaswamy Tiger Reserve, Cauvery Wildlife Sanctuary, Periyar National Park, Anamalai Tiger Reserve, Parambikulam Tiger Reserve
8	Pakistan	12 788	5 %	25	Karakouram National Park, Khunjerab National Park, Nanga Parbat Conservancy, Tangir Conservancy, Keti Bundar South Wildlife Sanctuary, Hingol National Park
9	Rann of Kutch	18 800	78 %	2	Kutch Desert Wildlife Sanctuary, Wild Ass Sanctuary, Narayan Sarovar Sanctuary, Kutch Bustard Sanctuary
10	Satpura Maikal	6 815	5 %	13	Bandhavgarh Tiger Reserve, Kanha Tiger Reserve, Melghat Tiger Reserve, Pench Madhya Pradesh Tiger Reserve, Pench Maharashtra Tiger Reserve
11	Eastern Ghats	8 455	3 %	21	Nagarjuna Srisailam Tiger Reserve, Amrabad Tiger Reserve, Gundla Brahmeshwara Wildlife Sanctuary, Simlipal Tiger Reserve, Kanger Ghati National Park, Karlapat Wildlife Sanctuary, Kotgarh Elephant Reserve, Dasapalla Elephant Reserve, Debrigarh Sanctuary, Chandil Dalma Elephant Reserve
12	Ranthambhore	3 281	5 %	9	Ranthambhore Tiger Reserve, National Chambal Wildlife Sanctuary, Palpur-Kuno Wildlife Sanctuary, Keoladeo National Park
Total		119 897	12 %	406	



Box 1 _ Western Ghats (KLC 7)

The Western Ghats are a biodiversity-rich, tropical mountain range that runs along the west coast of India and which receive immense rainfall from seasonal monsoons. Although the area accounts for less than 6 % of India's land area, it contains more than 30 % of all plant, fish, herpetofauna, bird and mammal species found in the country, much of which is highly threatened. A core complex of protected areas and adjacent forest reserves in the Western Ghats (Nagarahole, Bandipur, Wayanad, Mudumalai, Biligiri Rangaswamay and Sathyamangalam) support around 570 tigers, making it the largest contiguous population of tigers in the world. The region also supports the largest population of Asian elephant in the wild, numbering >11 000 individuals. The Western Ghats forms one of the world's biodiversity hotspots, and is a UNESCO World Heritage Site.

In addition to rich biodiversity, the Western Ghats have a large human population as the region has widespread fertile agricultural lands. The pressure of human population to take over wild habitats is one of the greatest threats to forests and wildlife, which is the cause of fragmentation of forests in the Western Ghats.

Priority interventions include: landscape-level land-use planning outside protected areas to ensure connectivity and reduce the impact of planned developments (roads, dams); protected area management; combatting illegal wildlife trafficking; improving human-wildlife conflict mitigation; fire control.

As few as 200 one-horned rhino survived by the early 21st century. Since then the population has recovered to over 3 500 as a result of strict protection in India and Nepal. Its conservation depends on continued effective management of protected areas, especially Kaziranga, where 70 % of the population lives.

is also in alignment with the CBD Strategic Plan Goal C (Target 11).[240] The following strategic approaches are proposed.

- Support policy implementation and site-based action to reduce direct threats to biodiversity within existing protected areas, and to increase the effectiveness of protected areas in conserving biodiversity and ecosystem services.
- Strengthen legal frameworks and support implementation of existing policies and laws enabling the creation, protection and expansion of PA networks.
- Expand the protection of key biodiversity areas within KLCs (filling important gaps) and develop robust PA networks that are resilient to the impacts of climate change. Particular emphasis is needed on the protection of under-represented ecosystems such as tropical coral reefs, sea-grass beds, deepwater cold coral reefs, seamounts, tropical forests, peatlands, freshwater ecosystems and coastal wetlands. Additionally, there is a need for increased attention to the representativeness, connectivity and effectiveness of protected areas.
- Support approaches to professionalise PA management, and ensure that PA staff members have the necessary knowledge, skills and motivation to perform PA management tasks effectively.[241] Professionalising PA management is in alignment with SDG Goal 8[242] (Target 8.5), which aims to achieve full and productive employment and decent work for all women and men. The zero-poaching toolkit is one source of lessons and techniques[243].
- Develop incentive-based mechanisms to improve recruitment, motivation and performance, and therefore PA management effectiveness.
- Strengthen professional training institutions for protected area personnel and establish mechanisms to develop a pool of qualified protected area professionals.
- Build the relevant capacity for the design and implementation of mechanisms such as PES, environmental impact assessments (EIAs) and biodiversity safeguards.
- Support human-wildlife conflict mitigation mechanisms, such as the establishment of early warning systems, effective compensation policies and enforcement of strict buffer zones, to help allow co-existence in densely populated landscapes.[244]

5.2.2 Increase the conservation value of lands outside formal protected areas

A landscape-scale approach will be essential to increasing the conservation value of unprotected, high-priority habitats outside the formal protected area systems. These are the areas where economic activity and conservation interact, and they are crucial for the future of biodiversity. Landscape level action needs the support of a policy environment that encourages mainstreaming of conservation into development planning.

(240) Convention on Biological Diversity. Strategic Plan. Goal C. Target 11. https://www.cbd.int/sp/targets/
(241) Appleton M. 2016. A Global Register of Competences for Protected Area Personnel. IUCN WCPA. Protected Area Technical Series Report No 2.
(242) https://sustainabledevelopment.un.org/sdg8
(243) http://zeropoaching.org/
(244) Dickman 2010. Complexities of conflict: the importance of considering social factors for effectively resolving human-wildlife conflict.

A native plant nursery supported by an Indian NGO. The nursery will support re-forestation in sacred groves, the traditionally protected, biodiversity-rich forest fragments in the Western Ghats. Recognising and supporting the many ways in which people sustain and manage the landscapes outside protected areas is a vital part of biodiversity and ecosystem conservation.

These approaches will address many of the 2030 Sustainable Development Goals. The following mechanisms are relevant for landscape approaches.

- Support the implementation of existing legal and policy frameworks, using mechanisms such as community conservation areas, ecologically sensitive/critical areas, protected forests and special conservation sites[245], to protect high-priority, unprotected sites and threatened species. Collaborative and aligned approaches involving local authorities, civil society and the private sector are key to implementing these mechanisms.
- Promote market- and incentive-based mechanisms for biodiversity conservation to enable the protection of sites and corridors, reduce conflict and achieve sustainable economic outcomes. Build on successes in certification schemes to develop integrated approaches involving civil society, government agencies and the private sector.
- Strengthen community institutions for natural resource governance by supporting activities that help clarify and formalise resource use and governance. This approach would be aligned with SDG 16[246], which addresses the importance of peace, stability, human rights and effective governance.
- Provide capacity development for implementing policy instruments that are able to mobilise more finance for protected areas, such as payments for ecosystem services, conservation trust funds, biodiversity offsets, market creation mechanisms for green products. This can involve support for developing the technical skills and knowledge necessary for the effective design, implementation and enforcement of these instruments, including the scientific knowledge base, skills in economic valuation of biodiversity and ecosystem services, sustainable land and water management, monitoring and evaluation.
- Support the creation of capacity, opportunities and mechanisms to facilitate greater interaction and collaboration between civil society and local authorities, especially in relation to mitigating threats to wildlife, communities and protected areas.

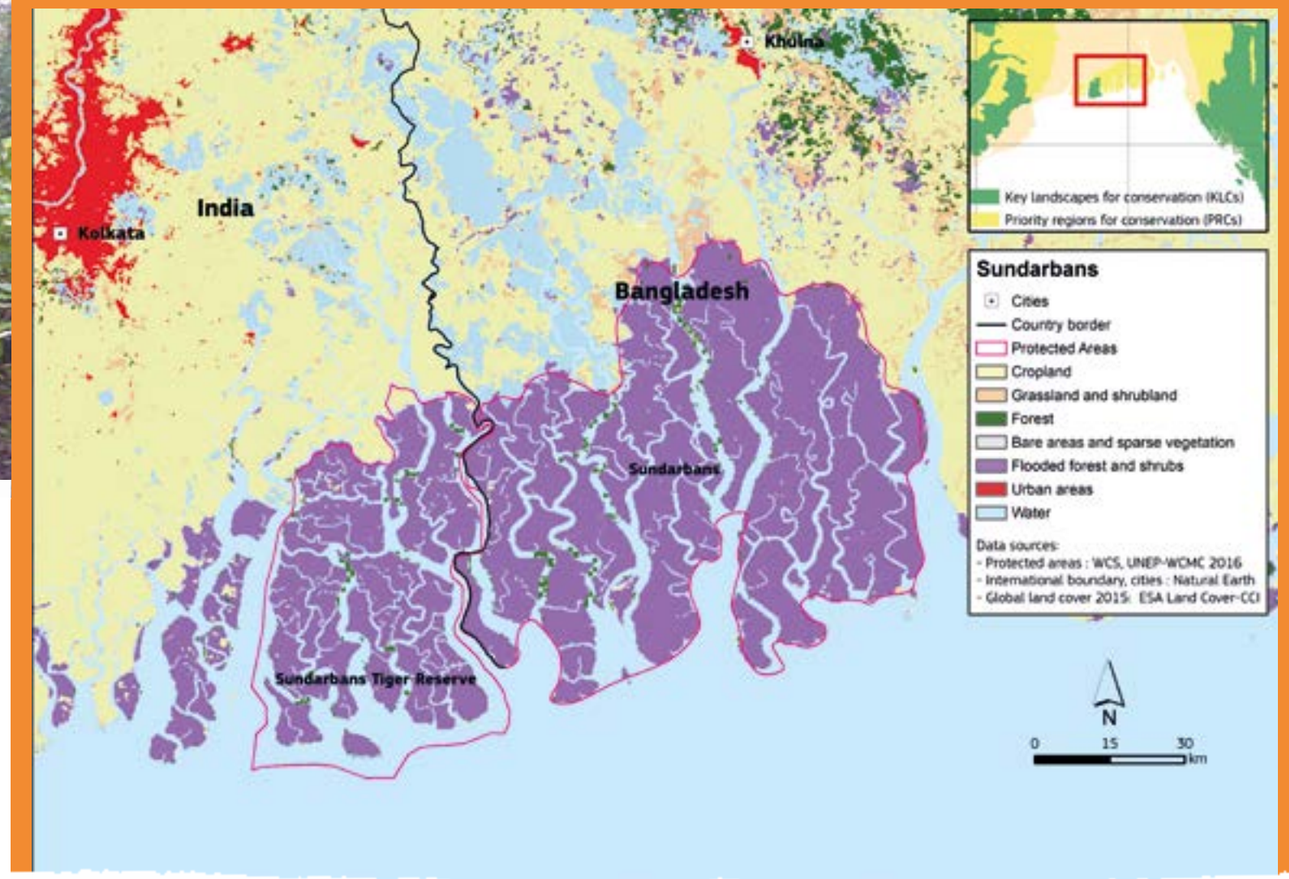
5.2.3 Encourage green growth and sustainable development

The Rio+20 Outcome Document (2012), strongly supported by the EU, identifies the transition to a green economy as a key objective of sustainable development. Under the EU Regional Asia programme, issues related to the green economy will be addressed in two areas: (i) adoption of sustainable consumption and production techniques by Asian manufacturers and service providers, in order to decouple economic growth from environmental degradation and natural resource depletion; (ii) leveraging of investment funding in green infrastructure, which will limit greenhouse gas emissions and increase resilience to climate change in vulnerable countries. Within this context, the following strategic approaches are proposed.

- Support sustainable infrastructure development, consumption and production systems, especially where economic activity impacts priority regions and sites. Pursue green growth and blue economy strategies that are aligned with

(245) Baral H.S., B. Sahgal, S. Mohsanin, K. Namgay and A.A. Khan (2014). Species and habitat conservation through small locally recognised and community managed Special Conservation Sites. Journal of Threatened Taxa 6(5), p. 5677–5685. http://dx.doi.org/10.11609/JoTT.o3792.5677–85

(246) http://www.undp.org/content/undp/en/home/sdgoverview/post-2015-development-agenda/goal-16.html

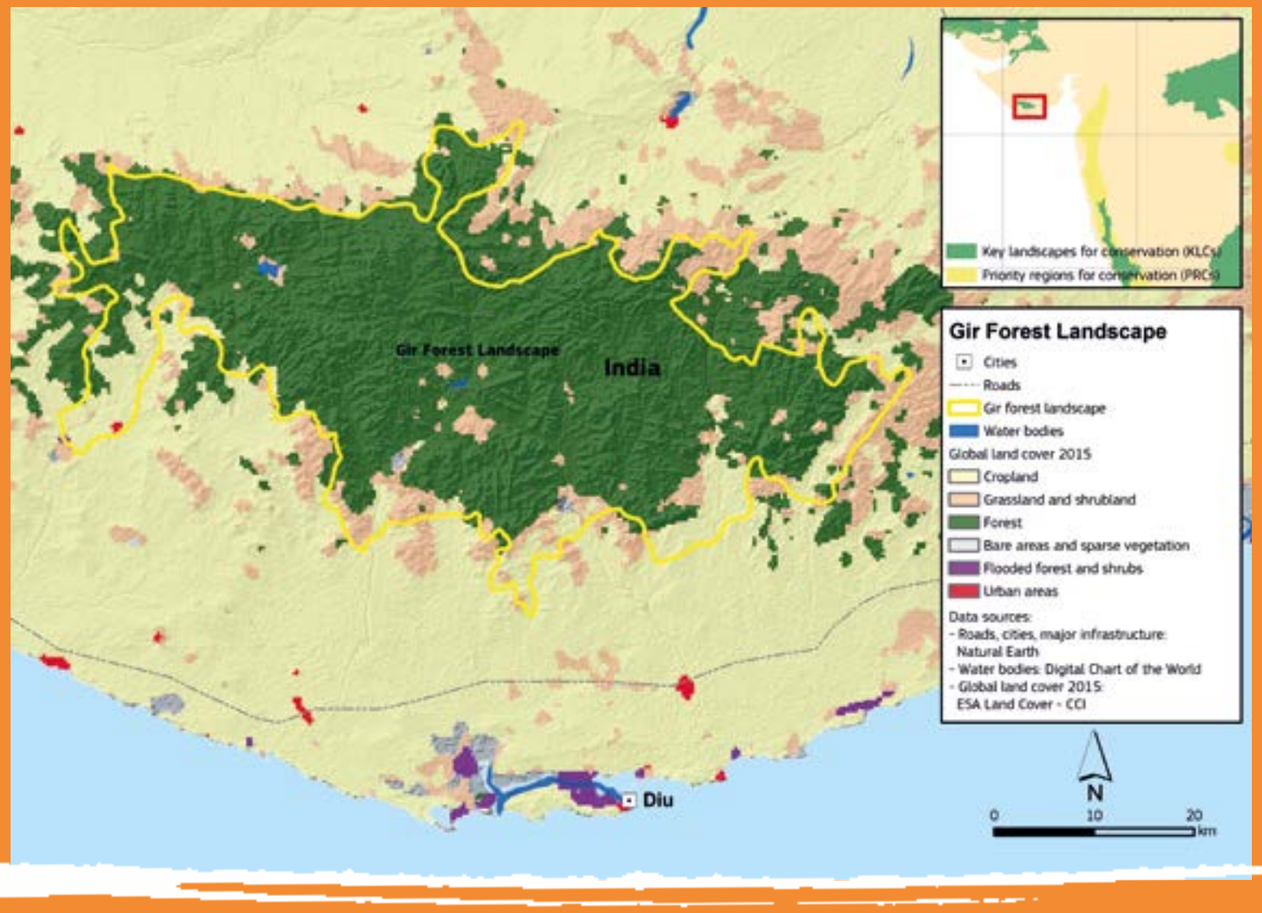


Box 2 _ Sundarbans (KLC 4)

The Sundarbans is the world's largest mangrove forest with an area of about 10 000 km², 60 % in Bangladesh and 40 % in India. Major portions of the Sundarbans in both countries have been listed as UNESCO World Heritage sites, and it is also a Ramsar site. The Sundarbans is home to major populations of globally endangered species such as the tiger (endangered), the masked finfoot (endangered), Ganges dolphin (endangered) and Irrawaddy dolphins (endangered), and northern river terrapin (critically endangered). In addition, the Sundarbans provides livelihoods for about 300 000 people, and protects about 2.5 million people living in villages and towns bordering the forest from cyclones, tidal surges and sea water incursion – threats that are increasing in a changing climate.

The coastal waters around the Sundarbans are characterised by extraordinarily high biological productivity fed by freshwater outflow from the Ganges-Brahmaputra-Meghna, the world's third largest river system, and the influx of nutrients provided by the mangrove forest. These oceanographic conditions combine to support a large diversity of cetaceans, sharks, rays and marine turtles that exist in large numbers, but are at risk of local extinction. Particularly threatened species include Ganges shark (critically endangered), large-tooth sawfish (critically endangered), Irrawaddy dolphin (endangered), Indo-Pacific humpback dolphin (vulnerable), Indo-Pacific finless porpoise (vulnerable), scalloped hammerhead shark (endangered), olive-ridley Turtle, loggerhead turtles, and large tooth and longcomb sawfish.

Priority Interventions: terrestrial protected area management; establishment of new marine protected areas; establishing sustainable fisheries; combating illegal wildlife trafficking; capacity building across many branches of the Government of Bangladesh; increased transboundary coordination on protected area management; working with the private sector (agricultural commodity companies and extractive industries) to reduce negative impacts.



Box 3 _ Gir Forest (KLC 1)

The Gir landscape is home to the last population of Asiatic lion (endangered); a sub-species of lion that once roamed across South-West Asia, but suffered a precipitous decline until the early 21st century. However, Asiatic lions (hereafter lions) have enjoyed a remarkable recovery since then, from a few dozen individuals at their lowest point at the beginning of the century to around 650 recorded in the 2017 census, due to targeted conservation initiatives and investment by the Government of Gujarat. The tolerance and support of the local communities who live alongside these iconic lions has also been important. As well as this population growth their range has expanded, with lions increasingly moving beyond their core area in Gir Wildlife Sanctuary to colonise adjacent forests. Nonetheless, they are endangered, and highly vulnerable to localised disturbances in the Gir landscape, including a growing threat from infrastructure development and unregulated tourism.

This rich landscape also supports a diverse assemblage of South Asia's unique flora and fauna, including mugger crocodile (vulnerable), Indian leopard (vulnerable) and four-horned antelope (vulnerable). The Gir landscape covers an area of approximately 10 000 km^2, including 1 883 km^2 of protected areas. By far the largest of these is the Gir Forest Wildlife Sanctuary (1 153 km^2) with the Gir Forest National Park (258 km^2) at its heart. The key habitats are dry-deciduous scrub forests; and dry-savannah forests, which are known locally as *vidis*.

Priority Interventions: increasing the capacity of frontline staff to prevent and mitigate human-wildlife conflict, to prevent the development of community grievances with lions and so promote continued long-term coexistence; mobilising communities to better protect lions and manage their interactions with them to avoid conflict, especially as lions expand their range; and landscape-level land-use planning to reduce the impact of planned developments such as roads and tourism ventures.

^

Forest guards, Dudhwa National Park, India. Protected areas are critical for conservation in South Asia. Greater support is required to ensure more effective management, to protect under-represented ecosystems, and to address the challenges of human-wildlife conflict and encroachment.

SDG Goals 9[247] and 12[248], (building sustainable and resilient infrastructure, promoting sustainable industrialisation, consumption and production patterns).

- Encourage the development and implementation of strong regulatory frameworks including strict biodiversity and environmental safeguards for large-scale linear infrastructure projects (roads, railway lines and waterway development), extractive industry (mining) and energy production (dams, power plants) that will affect priority regions. Green infrastructure will become increasingly relevant as a proactive mechanism to reconcile development impacts with ecological outcomes.[249]
- Enhance capacity for environmental impact assessments and mitigation mechanisms (e.g. biodiversity offsets) in industry, government and civil society, including capacity for effective monitoring of the implementation. Include the development of 'whistle-blower' mechanisms to improve transparency and accountability in the implementation of planning laws.
- Facilitate multi-stakeholder partnerships between government agencies, civil society and the private sector for EIAs, safeguards and mitigation measures, especially for land surrounding protected areas. Encourage the creation of effective public-private partnerships to promote 'green growth' policies to secure biodiversity-rich areas impacted by infrastructure development.

5.2.4 Strengthen governance to combat wildlife trafficking

Strategic approaches are in alignment with the EU Action Plan Against Wildlife Trafficking[250], which outlines clear steps toward three broad objectives: (i) preventing wildlife trafficking and addressing its root causes; (ii) implementing and enforcing existing rules and combating organised wildlife crime more effectively; and (iii) strengthening the global partnership of source, consumer and transit countries against wildlife trafficking. The following strategic approaches are recommended within this context.

- Implement and scale-up rigorous, intelligence-based enforcement efforts against illegal wildlife crime. Scaled-up model approaches, improved investigation and better documentation are needed to increase prosecution and conviction rates and to effectively tackle wildlife trafficking across the region.

(247) Sustainable Development Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation. http://www.un.org/sustainabledevelopment/infrastructure-industrialization/
(248) Sustainable Development Goal 12: Ensure sustainable consumption and production patterns – Sustainable infrastructure. http://www.un.org/sustainabledevelopment/sustainable-consumption-production/
(249) Wildlife Institute of India (2015). Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife. Draft. http://www.moef.nic.in/sites/default/files/Inviting%20commnets%20%26%20suggestions.pdf
(250) European Commission (2016). Op. cit.

Charcoal produced from invasive species in Nepal's forests. The charcoal trade provides income for rural households and helps to control the spread of the unwanted invasive species. It also creates incentives for forest conservation and helps to reduce cutting for fuel wood. Harmonising economic development and environmental sustainability is key to the shift towards greener economies.

- Strengthen and restructure existing transboundary initiatives (for example, SAWEN) to enable them to deliver greater efficiency and impact, and develop new transboundary intelligence and law enforcement approaches.
- Explore cooperation with the private sector[251] to address wildlife trafficking. In alignment with the United for Wildlife Transport Taskforce[252], encourage (for example) 'wildlife trafficking free' certification for airlines and shipping companies, airport and port operators, infrastructure companies, social media platforms and markets.
- Encourage the formulation and implementation of domestic CITES regulations in certain countries, in addition to addressing loopholes in national legal frameworks for wildlife conservation. Support mechanisms for more effective implementation of CITES.
- Support mechanisms for stronger law enforcement capacity and coordination across multiple agencies (for example, task forces), including those without direct mandates for wildlife protection. The International Consortium on Combatting Wildlife Crime's Indicator framework for Combating Wildlife and Forest Crime[253] is one starting point for a self-assessment of current legislative and enforcement arrangements for tackling wildlife crime.
- Support the use of anti-corruption and anti-money-laundering measures in addressing wildlife crime, including the recovery of assets and proceeds from crime.
- Strengthen enforcement in key geographies and at key points in the wildlife-crime trade chain, with the aim of institutionalising collaborative operations that bring together the necessary skills and legal authority to act, including attention to training and incentives for field operatives, communications and intelligence-sharing across borders and between jurisdictions along the trade chain.

5.2.5 Avert species extinctions and promote recovery of threatened species

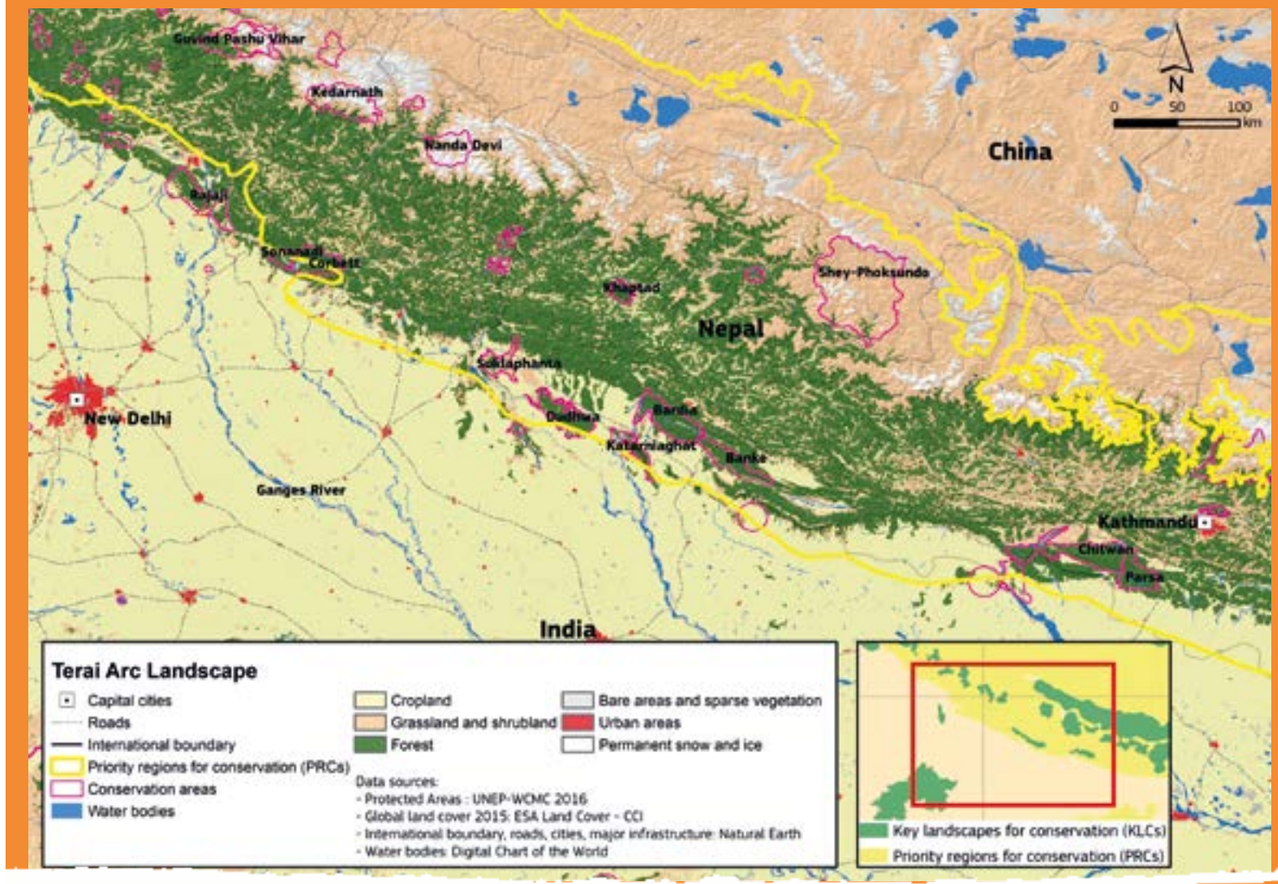
Threatened species categorised as 'critically endangered', 'vulnerable' and 'endangered' on the IUCN Red List[254] need targeted attention to avert extinctions in the near-term and promote recovery in the medium-term. Averting species extinctions is linked to Aichi Target 12 of the Convention on Biological Diversity. Investments in poverty alleviation and sustainable

(251) European Commission (2015). Strengthening cooperation with business sectors against illegal trade in wildlife. ED61083, Issue No 3. http://ec.europa.eu/environment/cites/pdf/studies/Illegal%20Wildlife%20Trade%20-%20Final%20Report.pdf

(252) The United for Wildlife International Taskforce on the Transportation of Illegal Wildlife Products comprises leaders from the global transportation industry. http://www.unitedforwildlife.org/#!/2016/03/what-is-the-transport-taskforce

(253) ICCWC is a collaborative effort of CITES, Interpol, UNODC, World Bank and the World Customs Organisation. https://cites.org/sites/default/files/eng/com/sc/66/Inf/E-SC66-Inf-22.pdf

(254) IUCN. The IUCN Red List of Threatened Species. www.iucnredlist.org



Box 4 _ Terai Arc Landscape (part of KLC 3)

The Terai Arc Landscape is an 810 km stretch of mixed forest, grassland and farmland situated between the River Yamuna in the west and the River Bhagmati in the east, and spans the border between southern Nepal and the sub-Himalayan north of India. It comprises the Shivalik hills, the adjoining Bhabhar areas and the Terai flood plains leading to the River Ganges. In total the landscape covers an area of 49 500 km^2, of which 30 000 km^2 lies in India. The landscape boasts some of the region's most well-known protected areas such as Corbett Tiger Reserve, Rajaji National Park, Dudhwa Tiger Reserve, Valmiki Tiger Reserve and Nepal's Bardia Wildlife Sanctuary, Chitwan National Park and Sukhla Phanta Wildlife Sanctuary.

The forests of this area are characterised by the dominance of Sal trees, whilst the associated grasslands are regarded as some of the tallest in the world, with some species growing higher than 7 metres. These habitats and associated wetlands are home to three flagship species – the tiger (endangered), the greater one-horned rhino (vulnerable), and the Asian elephant (endangered). The rivers of this region are also home to key populations of Gangetic dolphins (endangered) and gharial (endangered). The protected areas in this landscape are connected with one another through wildlife corridors, which are mostly part of the interconnected Reserve Forests. These corridors are used by wildlife, especially large mammals, to move from one forest to another, in an attempt to find new territory, mates and prey, and are in many cases transboundary between India and Nepal.

The conquest of malaria and the subsequent large-scale expansion of agriculture and dense human settlement over the past 50 or more years has resulted in dramatic fragmentation and degradation of the forest and grassland habitats in the landscape. Thus the interconnectivity of the remaining habitats holding some of the highest densities of tiger is critical and a major focus of conservation actions in the region.

Priority interventions: protected area management; landscape-level land-use planning outside protected areas to ensure connectivity and reduce the impact of planned developments (roads, dams); combatting illegal wildlife trafficking; and improving human-wildlife conflict mitigation.

Indian star tortoises for sale in a market in Bangkok. The species is only found in Pakistan, India and Sri Lanka, but many thousands are illegally exported every year for the global pet trade. Once exported, enforcement is complicated because the species is not protected by the laws of some transit countries, and because animals in trade are passed off as captive-bred.

development approaches do not guarantee positive outcomes for threatened species and their habitats, creating the need for an explicit focus on averting extinctions. Within this context, the following strategic approaches are recommended.

- Improve the conservation status of all threatened species that occur within the prioritised KLCs by implementing science-based, community-informed conservation actions to promote their recovery. Support the implementation of species-focused action plans.
- Support site-based and policy interventions aimed at reducing or eliminating direct and indirect threats to the survival of threatened species. Promote the application of scientifically rigorous monitoring tools for threatened species to help provide data for species management and recovery.
- Catalyse attention to species identified as priorities in NBSAPs.[255] These include threatened species as identified in the IUCN Red List as well as other species considered national priorities: for example, the Himalayan monal is classified as of least concern on the IUCN Red List but nationally important for Nepal; the chinkara gazelle is listed as of least concern by IUCN because of a well-protected population in India but it is almost extinct in Pakistan.
- Link critical gaps in actions for the conservation of priority species with the conservation of KLCs. Specifically, additional investments in site-based conservation of high profile species such as tiger, snow leopard, elephant and rhino should (a) complement and not replace existing and planned investments; (b) target policy-level actions; and (c) build on successful approaches.
- Prioritise actions for the recovery of lesser-known, threatened species which require relatively low investments, for example large water birds, freshwater fish and turtle species and their habitats, focused through species recovery plan processes. Provide additional protection for species that are subject to demand-driven exploitation for the illegal wildlife trade (for example, pangolin).
- Strengthen and align domestic legislation and enforcement priorities to include species listed on CITES Appendices[256]. Provide further support for mechanisms such as the establishment of non-detriment findings and CITES quotas to enforce CITES listings of threatened species.

([255]) Nepal National Biodiversity and Action Plan: Tables 6, 7 and 8, pp. 20–21, and Bhutan National Biodiversity and Action Plan: Tables 3 and 4, pp. 17 and 21. Both available from www.cbd.int/nbsap

([256]) www.cites.org

Women fishing in the Terai region of Nepal. South Asia's rivers are vital livelihood resources, and connect the Himalayan regions with the densely populated lowlands. Dam-building and water-abstraction programmes have impacts on water quality and volume, which are felt across state and international borders.

5.3 Conclusion

South Asia's biodiversity represents an extraordinary wealth of species and ecosystems, many of them unique. The region's equally rich and diverse cultures have used and managed these resources for centuries, and species and ecosystems are still a key part of both economic and cultural life. Despite being increasingly depleted and under pressure, the region's ecosystems provide services and products of enormous economic and cultural value, many of them irreplaceable. A great deal has been done to establish protected areas and put in place laws and policies to protect these values, and there are increasing examples where these values are taken into account in economic decision-making, from local to international levels. Whether these positive developments can counter the growth in demand for resources from increasingly wealthy, urban populations remains to be seen. New partnerships of government, business and civil society will be needed to address these challenges.