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# Conservation of Coastal Wetlands: An Appraisal of the Policy and Legal Framework in South Asian Nations

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## Abstract

Coastal wetlands are highly productive ecosystems that provide wide range of ecosystem services. South Asia, with its long coastline, has diverse coastal wetland ecosystems that are subject to serious threats caused by pollution and over-exploitation of resources. The legal environmental instruments of different nations illustrate their intent towards the sustainable environmental governance. South Asian nations have formulated policies and legal framework for efficient management of coastal wetland resources and to meet the standards set by international regulatory instruments. This chapter discusses the national legal instruments and institutional frameworks structured to address the issues faced by coastal wetlands of the five maritime South Asian nations, namely, India, Sri Lanka, Maldives, Bangladesh and Pakistan. It also discusses the international instruments, the guiding principles for development of national instruments, to be enforced to conserve and manage the coastal resources in a sustainable and effective way.

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## Keywords

Act • Coastal wetlands • Conservation • Environmental governance • Policy

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## 27.1 Introduction

### 27.1.1 Coastal Wetlands: An Overview

The wetlands are areas covered by water either at or near the surface of the soil, either all through the year or temporarily (seasonally). As per the Ramsar Convention, the wetlands are defined as ‘areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters’ (Ramsar Convention Secretariat 2010).

The coastal wetlands play an important role in supporting a wide spectrum of biodiversity characterized by the presence of water-dependent species of plants and animals along the coast, as well as maintaining many natural cycles. These diverse and complex ecosystems provide goods and services that contribute towards the nation’s economy. The ecosystem services provided by these wetlands to the communities are broadly classified as provisioning services, regulating services, supporting services and cultural services.

### 27.1.2 Status of Coastal Wetlands of South Asia

The South Asia (SA) comprises the sub-Himalayan and adjoining countries to the west and east and includes Afghanistan, India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan and Maldives. Of these, Afghanistan, Nepal and Bhutan are land-locked countries and hence are not considered in this chapter. While Bangladesh, India and Pakistan are situated on the Asian mainland, Maldives and Sri Lanka are island nations. A summary of the major features of the five maritime countries of South Asia is given in Table 27.1.

The coasts of South Asia harbour a wide range of coastal ecosystems and habitats, *viz.* mangroves, coral reefs, sand dunes, mudflats, salt marshes and seagrass

**Table 27.1** Geographic and demographic information

Country	Population	Area (km <sup>2</sup> )	Coastline (km)	Area within EEZ (km <sup>2</sup> )	Shelf area (km <sup>2</sup> )
Bangladesh	14,97,72,364 (Census, 2011)	1,47,570	580	86,392	66,438
India	1,21,01,93,422 (Census, 2011)	3,28,80,00,000	7,517	2,305,143	4,02,996
Maldives	4,07,660 (Census, 2014)	300	644	9,23,322	34,538
Pakistan	1,32,352 (Census, 1998)	7,96,095	1,046	2,35,999	51,383
Sri Lanka	2,03,59,439 (Census, 2012)	65,610	1,340	5,32,619	32,453
<b>Total</b>	<b>1,38,08,65,237</b>	<b>3,28,90,09,575</b>	<b>11,127</b>	<b>40,83,475</b>	<b>5,87,808</b>

**Table 27.2** Coastal wetlands of South Asian countries

Country	Wetland areas (km <sup>2</sup> )					
	Inland	Coastal	Manmade	Total wetland area	Mangroves	Coral reefs <sup>a</sup>
Bangladesh	46,000 <sup>b</sup>	51,968 <sup>c</sup>	73,587 <sup>c</sup>	171,555	4,365.70 <sup>d</sup>	<50
India	66,230.67 <sup>e</sup>	37,039.71 <sup>e</sup>	43,779.77 <sup>e</sup>	147,050.15	4,628 <sup>f</sup>	5,790
Maldives	1.75 <sup>g</sup>					8,920
Pakistan	74,079.2 <sup>h</sup>		1,956.7 <sup>i</sup>		1,683 <sup>i</sup>	<50
Sri Lanka	60,935.9 <sup>j</sup>	2,170.64 <sup>j</sup>	8,400.7 <sup>k</sup>	71,507.24	6,080 <sup>k</sup>	680

<sup>a</sup>Spalding et al. (2001)

<sup>b</sup>CBD (2012)

<sup>c</sup>Byomkesh et al. (2009)

<sup>d</sup>Dahdouh-Guebas and Satyanarayana (2012)

<sup>e</sup>SAC (2011)

<sup>f</sup>FSI (2013)

<sup>g</sup>UNEP (2006)

<sup>h</sup>Rais et al. (2013)

<sup>i</sup>Abbas et al. (2011)

<sup>j</sup>CBD (2009)

<sup>k</sup>IUCN Sri Lanka and CEA (2006)

meadows. The significant ones are the reefs of Gulf of Mannar, Lakshadweep Islands in India, atolls of Maldives and mangroves of the Sundarbans spread across India and Bangladesh. The large coastal lagoons of Chilika and Puttalam are located in India and Sri Lanka, respectively. The entire coastline from Pakistan to Bangladesh runs to about 10,000 km, with wetlands occupying 134,161 km<sup>2</sup> (UNEP and DA 2008). The distribution of coastal wetlands in the South Asian countries is provided in Table 27.2.

The coastal wetlands face various challenges due to the complex interactions among physical, biological and anthropogenic factors. The human populations are concentrated along the coasts, which has affected and altered the coastal ecosystems worldwide (Adger et al. 2005). The anthropogenic pressures include those from industrial, agricultural, aquaculture and urban developmental activities, which result in the discharge of wastes into waterways, over-exploitation of the coastal and marine resources and the physical alteration and destruction of habitats. The waste disposed into the rivers and estuaries ultimately reach the coastal waters and contribute to eutrophication and deterioration of the water quality. Reclamation of wetlands, as well as encroachment for various activities, has also shrunk the areal extent of the wetlands in many places (MEA 2005). Further, the coastal wetlands are also threatened by climate change including the increasing temperature, sea level rise (SLR) and other extreme events (Day et al. 2008).

Each South Asian country possesses significantly diverse coastal wetland biodiversity, which is discussed in the ensuing sections. An estimated 135 million people, accounting to about 22.5% of the global coastal population, inhabit the coastal zone of South Asia. The coastal zones account for about 40% of the economic activities in the region. Because of the high levels of interlinkages between

the natural ecosystems, especially wetlands, the conservation actions need to be implemented at scales that commensurate with the ecological processes, features and services, in order to achieve meaningful habitat and biodiversity-oriented goals. Hence, only the efforts at ecosystem and landscape scale would yield reliable results. Recognizing this, the conservation efforts of coastal wetlands are carried out through various soft and hard regulatory instruments at the international level and through appropriate policy and legislations at national level, often derived from international frameworks.

This chapter reviews the status of various instruments at the global level focusing on the conservation of coastal wetland ecosystems, as well as the relevant policy and legal frameworks adopted by different coastal South Asian countries. This chapter also offers a review of the current regulatory provision for conservation of coastal wetlands in South Asia and the way forward.

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## 27.2 Global Perspective on Wetland Conservation

A number of ‘soft’ instruments such as consultative conference, declarations and guidelines, and ‘hard’ instruments such as bilateral and multilateral treaties and conventions have been promulgated over the years that have components for the conservation of wetlands.

### 27.2.1 Conference Declarations

The United Nations Conferences: beginning in 1972, four conferences have been held.

The *United Nations Conference on the Human Environment* held in 1972 at Stockholm, Sweden, was the first of the series. The principle 2 of the Stockholm Declaration stated that ‘The natural resources of the earth, including the air, water, land, flora and fauna and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate’ (UN 1972). Many countries, including India, followed up this conference declaration by enacting framework legislations to protect the environment.

In 1992, the *United Nations Conference on Environment and Development* (UNCED) was held in Rio de Janeiro, Brazil. Also known as the Earth Summit, the Agenda 21 brought out during the conference has been considered a blueprint for sustainable development (UN 1992). The conference called for integrated coastal zone management (ICZM) and ecosystem-based approach, which replaced the sectoral approach. The agenda classifies the coastal wetlands as fragile environment that needs priority for prevention from desertification and degradation. It encouraged the states to identify the coastal ecosystems that exhibit high levels of biodiversity and productivity for effective management. It also called for demarcation of coastal areas that require intense conservation and protection by establishing

protected areas. The objective of these proposed recommendations at the conferences in *Agenda 21* aimed at wise and sustainable use and management of natural resources for longer sustenance of resource-dependent community livelihoods. Three important multilateral agreements, Convention on Biological Diversity (CBD), United Nations Convention to Combat Desertification (UNCCD), and United Nations Framework Convention on Climate Change (UNFCCC), collectively called the Rio Conventions were opened for signature by the participating parties during the Earth Summit, of which the CBD is of high relevance with respect to conservation of biodiversity including that of wetlands (UNCED 1993).

In 2002, the *World Summit on Sustainable Development* (WSSD) was held at Johannesburg, South Africa. The Johannesburg Declaration on Sustainable Development and Johannesburg Plan of Implementation (JPOI) called on states to, inter alia, 'develop national, regional and international programmes for halting the loss of marine biodiversity, including coral reefs and wetlands; implement the Ramsar Convention, including its joint work programme with the Convention on Biological Diversity, and the programme of action called for by the International Coral Reef Initiative to strengthen joint management plans and international networking for wetland ecosystems in coastal zones, including coral reefs, mangroves, seaweed beds and tidal mud flats; and reduce the risks of flooding and drought in vulnerable countries by, inter alia, promoting wetland and watershed protection and restoration, improved land use planning, improving and applying more widely techniques and methodologies for assessing the potential adverse effects of climate change on wetlands and, as appropriate, assisting countries that are particularly vulnerable to those effects' (UN 2002).

Recently, in 2012, the *United Nations Conference on Sustainable Development* (Rio+20) was held in Rio de Janeiro, Brazil. The conference had two main themes of green economy in the context of sustainable development and poverty eradication and the institutional framework for sustainable development for international coordination and highlighted seven priority areas including water and oceans (UN 2012).

Thus, the various United Nations Conferences have emphasized the need for conservation and protection of wetlands, especially those in coastal areas, and, in some cases, given explicit instructions on the way forward, usually achieved through international conventions and national legislation.

### 27.2.2 Multilateral Agreements

The Ramsar Convention on Wetlands, the United Nations Convention on the Law of the Sea (UNCLOS), the CBD, the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) are the most relevant multilateral agreements in force today and are briefly discussed in the following sections.

### 27.2.2.1 Ramsar Convention

The Convention on Wetlands of International Importance, especially as Waterfowl Habitat, better known as Ramsar Convention, provides the framework for the conservation and wise use of wetlands and their resources. The convention was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975. Although the convention originally emphasized the conservation of the wetlands as habitat for waterfowl, over time, its scope broadened to encompass all aspects of wetland conservation and sustainable use (UN 1971). The central philosophy of Ramsar Convention is the ‘wise use’ of wetlands, ‘the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development’ (Ramsar Convention Secretariat 2010). The contracting parties commit to work towards the wise use of all the wetlands and water resources in their territory, through national plans, policies and legislation, management actions and public education.

To facilitate the conservation of wetlands, the convention has broadly classified the wetlands into five major types: (1) *marine* (coastal wetlands including coastal lagoons, rocky shores and coral reefs), (2) *estuarine* (deltas, tidal marshes and mangrove swamps), (3) *lacustrine* (wetlands associated with lakes), (4) *riverine* (wetlands along rivers and streams), and (5) *palustrine* (marshes, swamps and bogs) (Ramsar Convention Secretariat 2004).

All the coastal states of South Asia, except Maldives, are contracting parties to the Ramsar Convention (Table 27.3). Being a signatory to the convention, the member countries are entitled to access (1) expert advice on national and location-specific problems of wetland conservation and management and (2) international support for conservation. It also brings increased publicity and prestige for the designated wetlands and provides an opportunity to the member states to make their voice heard in the principal intergovernmental forum (Ramsar Convention Secretariat 2013). The major success of the convention is in enhancing the

**Table 27.3** South Asian countries and membership in international conventions

Country	Ramsar <sup>a</sup>	CMS <sup>b</sup>	UNCLOS <sup>c</sup>	CBD <sup>d</sup>	CITES <sup>e</sup>
Bangladesh	21.09.1992	Party (2005)	27.07.2001	01.08.1994	20.11.1981
India	01.02.1982	Party (1983)	29.06.1995	19.05.1994	20.07.1976
Maldives	Not a member	Range state	07.09.2000	29.12.1993	12.12.2012
Pakistan	23.11.1976	Party (1987)	26.02.1997	24.10.1994	20.04.1976
Sri Lanka	15.10.1990	Party (1990)	28.07.1995	21.06.1994	04.05.1979

<sup>a</sup>Ramsar (2015)

<sup>b</sup>CMS (2015)

<sup>c</sup>UNCLOS (2015)

<sup>d</sup>CBD (2015)

<sup>e</sup>CITES (2015)

awareness of the importance of wetlands for a wide range of ecosystem services they provide and the conservation of designated Ramsar sites. Further, the convention has also helped in poverty alleviation through implementation of ‘working for water’ and ‘working for wetlands’ programmes.

#### **27.2.2.2 Convention on Migratory Species of Wild Animals**

The CMS, also known as the Bonn Convention, which was signed in 1979, came into force in 1983. This multilateral treaty aims to conserve terrestrial, aquatic and avian migratory species throughout their range. It provides a global platform for the conservation and sustainable use of migratory animals and their habitats, bringing together the states through which migratory animals pass (range states), and lays the legal foundation for internationally coordinated conservation measures throughout a migratory range (CMS 2005). The migratory species threatened with extinction are listed on Appendix I of the convention. The CMS parties strive for protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them (Matz 2005). The migratory species that need or would significantly benefit from the international cooperation are listed in Appendix II of the convention. The agreements between the states in various forms help in concerted action to protect the migratory species and their habitats. Among the five South Asian maritime states, Maldives is listed as a range state, while the others are parties to the convention (Table 27.3).

#### **27.2.2.3 United Nations Convention on the Law of the Sea, 1982**

Recognized as the ‘Constitution of the Oceans’, UNCLOS came into force on 16 November 1994. The Articles 61 and 62 deal with the conservation and utilization of living marine resources within the exclusive economic zone (EEZ), and the Articles 117–119 deal with the conservation of living resources in the high seas. The UNCLOS serves as a framework convention for other international treaties such as CBD. All the five South Asian maritime nations are signatories to UNCLOS (Table 27.3).

#### **27.2.2.4 Convention on Biological Diversity**

One of the three Rio Conventions, the CBD came into force on 29 December 1993. Its main goals are conservation of biological diversity, sustainable use of its components and fair and equitable sharing of benefits arising from genetic resources. Among the seven thematic programmes established by the convention, the programme on marine and coastal biodiversity evolved from the Jakarta Mandate, a global consensus on the importance of marine and coastal biological diversity and a part of the ministerial statement at the Conference of the Contracting Parties (COP) meeting in Jakarta in 1995. It identifies the key operational objectives and priority activities within the key programme elements, namely, implementation of integrated marine and coastal area management, marine and coastal living resources, marine and coastal protected areas, mariculture and alien species and genotypes. It uses the ecosystem approach as one of the basic principles for the implementation of the programme of work. The CBD works in cooperation with Ramsar and other

conventions to conserve biodiversity through various coordinated activities, and all the five maritime nations of South Asia are parties (Table 27.3).

### **27.2.2.5 Convention on International Trade in Endangered Species of Wild Fauna and Flora**

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) came into force on 1 July 1975. The aim of this convention is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. As the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation. The convention accords varying degrees of protection to more than 35,000 species of animals and plants, regardless of the form in which they are traded. The CITES provides a framework to enable parties to adopt their domestic legislation to implement CITES at the national level. Though it does not specifically target wetlands, its scope encompasses the biodiversity of the wetlands by focusing on their trade to ensure that the wetland biore-sources are not over-exploited. All five South Asian maritime nations are parties to CITES (Table 27.3). A bill to amend India's Wildlife (Protection) Act was introduced in the Upper House of Parliament in 2013. This amendment includes provisions relating CITES to control illegal trade of wildlife and the insertion of new Schedule VII to the act listing flora and fauna for purpose of regulation of international trade under CITES in which a number of coastal and marine species have been included (MoEF 2013).

## **27.2.3 Regional Instruments**

There are a number of regional level instruments in the form of cooperative agreements and action plans focusing on various parts of the environment especially with respect to the conservation initiatives related to coastal ecosystems.

### **27.2.3.1 South Asia Co-operative Environment Programme**

The South Asia Co-operative Environment Programme (SACEP) is an intergovernmental organization, established in 1982 by the governments of South Asia region to promote and support protection, management and enhancement of the environment in the region (SACEP 2015). Since its creation, SACEP has implemented a number of projects and programmes in the areas of environment education, environment legislation, biodiversity, air pollution and the protection and management of the coastal environment. Presently, the programme focuses on the development of strategies to cope with the natural disasters. Further, the ICZM, development and implementation of National and Regional Oil and Chemical Spill Contingency Planning, implementation of Marine Litter Programme and institutional strengthening and capacity development for the long-term management and conservation of Marine and Coastal Protected Areas (MCPAs) encompassing coral reefs in South Asia are some of the priority areas of SACEP.



The SACEP is also the secretariat for the South Asian Seas Programme (SASP), one of United Nations Environment Programme's (UNEP's) Regional Seas Programme. The South Asian Seas Action Plan (SASAP), adopted in March 1995, focuses on ICZM, oil spill contingency planning, human resource development and the environmental effects of land-based activities. Although there is no regional convention yet, SASAP follows existing global environmental and maritime conventions and considers Law of the Sea as its umbrella convention.

### **27.2.3.2 Mangroves for the Future**

The Mangroves for the Future (MFF) is a unique partner-led initiative to promote investment in the coastal ecosystem conservation for sustainable development and is co-chaired by IUCN and United Nations Development Programme (UNDP) (MFF 2015). This initiative applies an ecosystem-based approach to build community resilience in diverse coastal habitats. It initially focused on the countries that were worst affected by the tsunami in 2004 but now includes other countries as well. While the mangroves are the central focus of this initiative, MFF is inclusive of all types of coastal ecosystems and habitats. The MFF grants facility offers small, medium and large grants to support initiatives that provide practical and hands-on demonstrations of effective coastal management in action. Each country manages its own MFF programme through a national coordinating body with representation from government, non-governmental organizations (NGOs) and private sector.

### **27.2.3.3 Instruments of the Convention on Migratory Species**

The Central Asian Flyway (CAF) covers a large continental area of Eurasia between the Arctic and Indian Oceans and the associated island chains. The CAF includes various habitats that provide abode to migratory waterbirds, and an action plan was drafted to conserve those migratory waterbirds and their habitats. The plan covers over 182 migratory waterbird species, which includes 29 globally threatened and near-threatened species (CMS 2005). It represents several important migration routes relevant to waterbirds covering 30 countries of North, Central and South Asia and the Transcaucasus region. The Central Asian Flyway states have undertaken to promote the conservation of migratory waterbirds and their habitats. The nesting habitat of these species in the countries of their flyway are identified and protected. Their habitats range from inland deserts to coastal wetlands. The Plan calls for a collaborative approach of national/international and state/non-state agencies.

*Indian Ocean-South-East Asian Marine Turtle Memorandum of Understanding* is an intergovernmental agreement concluded under the auspices of the Convention on Migratory Species (CMS). It aims to protect, conserve, replenish and recover marine turtles and their habitats of the Indian Ocean and South-East Asian region, working in partnership with other relevant actors and organizations. The species of marine turtles covered by the MoU are the loggerhead (*Caretta caretta*), olive ridley (*Lepidochelys olivacea*), green sea turtle (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), leatherback (*Dermochelys coriacea*) and flatback (*Natator depressus*). The conservation and management plan under the MoU containing 24 programmes and 105 specific activities focus on reducing threats, conserving critical habitats,

exchanging scientific data, increasing public awareness and participation, promoting regional cooperation and seeking resources for implementation.

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## **27.3 Policy Frameworks for Wetland Conservation**

Conservation policies are broad statements of intent to deal with the environmental issues that aid in framing appropriate legislation. These policies are framed in consonance with the environmental and social principles, set by the international regulatory instruments. The guiding environmental principles include the ecological sustainability, the polluter pays principle and the precautionary principle. The social principles that guide policymaking include equity, human rights and public participation. However, the economics dictate the implementation and execution of the environmental policy. Providing incentives for the implementation of the policies and the market-oriented approach has been widely adopted at national and international levels. A brief account of the environmental policies of the five coastal South Asian nations for addressing the protection, governance and conservation of their national wealth of coastal wetlands is presented hereafter.

### **27.3.1 Bangladesh**

#### **27.3.1.1 National Water Policy, 1999**

The National Water Policy (NWP) of Bangladesh was framed to address the issues surrounding river basin planning, water rights and allocation, participation of public and private institutions, water supply and sanitation, fisheries, navigation, agriculture, industry and environment (MoWR 1999). Fisheries and wildlife play a critical role in the economic development of Bangladesh, and, in order to safeguard these resources, the policy takes measures to minimize the disruption to the natural aquatic environment in streams and waterways. The policy also indicates that any sort of developmental activities requiring direct access to waterways should not interfere with fish migration and breeding that could pose threat to their population. Aquaculture developments in brackish areas are given special zones to limit their influence on the coastal wetland ecosystems. This policy addresses the concern over the availability of water for the protection, restoration and preservation of the ecosystems such as wetlands and other national forests. In addition, the quality of water available for environmental sustainability was emphasized as it plays a crucial role in sustaining a balanced ecosystem. The policy highlights the environmental issues faced by the coastal ecosystems, especially by the wetlands, such as groundwater depletion, watershed degradation and deforestation, salinization of agricultural lands, excessive sedimentation, reduction of biodiversity, wetland loss, saltwater intrusion and coastal zone habitat loss. Further, the National Environmental Management Action Plan (NEMAP) and the National Water Management Plan (NWMP) were framed. Additionally, the policy enunciated the importance of upland water flow to preserve the coastal estuarine ecosystems by minimizing the

seawater intrusion. It encourages extensive afforestation, stop clearance of vegetation on newly accreted agricultural lands and reduction of discharge of pollutants into the environment.

### **27.3.1.2 Coastal Zone Policy, 2005**

The Coastal Zone Policy (CZP) was framed as a step to protect Bangladesh's vulnerable coastal zone, which is prone to natural disaster such as cyclone, floods, storm surges, coastal erosion, increase of soil salinity and coastal pollution. The objectives of this policy are to (1) conserve the coastal resources for their contribution to the national economy, (2) improve the socioeconomic status of the coastal livelihoods and (3) protect the coastal zone from natural disasters and prevent further deterioration of the coastal environment. The policy provides the general guidance for managing and developing the coastal zone of Bangladesh. It inculcated the concept of ICZM for better understanding and management of the coastal zone (MoWR 2005). The policy framework is based on eight principles that include economic growth, opportunities for livelihoods, reduction of vulnerabilities, sustainable management of natural resources, equitable distribution, empowerment of communities, women empowerment and conservation and improvement of critical ecosystems.

The protection of coastal zone has been incorporated into the Comprehensive Disaster Management Plan, with the introduction of sea dykes as the primary line of defence against storm surge (MoWR 2005). The sustainable use of coastal resources and environmentally adapted and socially responsive aquaculture activities are encouraged along the coastal areas, which would have minimal impact on the coastal wetland ecosystems. The afforestation of the coastal areas and the conservation of coastal forests with a socially responsible use of coastal forestry resources are intended. The policy acknowledges the importance of international instruments and agreements during the formulation of the coastal conservation and management plan. Bangladesh also has developed the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in 2009.

## **27.3.2 India**

### **27.3.2.1 National Forest Policy, 1988**

The National Forest Policy, 1988, aims at maintaining the environmental stability of the forest, restoring the ecological balance of the forests and conserving the country's natural heritage (forests). It has a check over the extension of sand dunes along the coastal tracts, and it promotes the increase in forest cover along the ocean shores through afforestation and thereby increasing their productivity (MoEF 1988).

### **27.3.2.2 National Conservation Strategy and Policy Statement on Environment and Development, 1992**

This policy statement provides guidelines to develop the nation's environment and aids in the implementation of policies that are framed for protecting the

environment (MoEF 1992). The policy statement gives an outline of the legal instruments, institutions and the measures taken to prevent various aspects of environmental concerns such as pollution control, forest and wildlife conservation, land and soil conservation, environmental impact assessment and environmental awareness programmes. Under Section 2, Environmental Problem: Nature and Dimensions, it is clearly mentioned that problems of pollution and over-exploitation are being faced by the country's unique wetlands that provide not only food and shelter but also serve as the breeding and spawning grounds for the marine and freshwater fishes and that the coastline as well as coastal ecosystems such as mangroves and coral reefs are under stress due to over-exploitation. It suggested various steps to be taken for the sustainable use of land and water including conservation of wetlands for ensuring sustainable ecological and economic benefits and for conservation of biodiversity through a network of protected areas including biosphere reserves, marine reserves, national parks, sanctuaries, gene conservation centres, wetlands and such other natural habitats of biodiversity.

### **27.3.2.3 National Environmental Policy, 2006**

The National Environmental Policy (NEP) aims at plugging the gaps in the policy instruments framed for conserving and protecting the environment. With respect to wetlands, the policy recognized the non-existence of a formal system of wetland regulation outside the international commitments made in respect of Ramsar sites. It also called for a holistic view of wetlands, which looks at each identified wetland in terms of its causal linkages with other natural entities, human needs and its own attributes. Further, it suggested that a legally enforceable regulatory mechanism for identified valuable wetlands should be developed along with a national inventory of such wetlands to prevent their degradation and enhance their conservation; conservation and prudent use strategies for each significant catalogued wetland, with participation of local communities and other relevant stakeholders, should be formulated (MoEF 2006). With respect to the coastal resources, the NEP mentions that these resources comprise a diverse set of natural and manmade assets, including mangroves, coral reefs, estuaries, coastal forests, genetic diversity, sand dunes, geomorphological features, sand beaches, land for agriculture and human settlements, coastal infrastructure and heritage sites. It suggested a series of action plans including mainstreaming of sustainable management of mangroves into the forestry sector, supporting regeneration of coral reefs, explicitly considering issues of sea level rise and climate change and adopting a comprehensive approach to integrated coastal zone management.

### **27.3.3 Maldives**

Article 22 of the Constitution of Maldives states that it is a fundamental duty to protect and preserve the natural environment of the country for the benefit of present and future generations. Vision 2020 of the Maldives government expresses the country's aspiration for environmental protection and preservation. One of the six

long-term goals envisioned is ‘protective measures will be taken to combat global environmental threats and environmentally friendly lifestyles will be adopted’. The first National Environmental Action Plan (NEAP I) had been formulated in 1990, and the second National Environmental Action Plan (NEAP II) was formulated in 1999. The successive national development plans have stressed the importance of sound practices for environmental and natural resources management (GoM 2014).

### **27.3.4 Pakistan**

#### **27.3.4.1 National Environmental Policy, 2005**

The NEP of Pakistan provides an overall framework for addressing various environmental issues in Pakistan such as pollution of fresh and coastal waters, air pollution, deforestation, desertification, natural disasters, climate change and loss of biodiversity. The policy clearly gives directives for sectoral and cross-sectoral actions for improving the coastal health, its resources and the dependent communities. The policy was drafted around a set of objectives, *viz.* conservation, restoration and management of environmental resources, adaptation of integrated environmental planning, enhancing the capacity of government agencies and compliance with international obligations (MoE 2005). The policy ensures protection and rehabilitation of mangroves, and in cases of critically threatened ecosystems, it encourages conservation and restoration. The policy lays provision to create national parks and marine protected areas for conservation of biodiversity with the involvement of the community. It encourages the implementation of integrated coastal zone management plans for protection of marine life and/or bioresources.

#### **27.3.4.2 National Wetlands Policy, 2009**

The National Wetland Policy (NWP) aims at addressing the threats to Pakistan’s wetlands, creating and implementing regulative measures for sustainable use and conservation of wetlands, executing a coordinated approach nationally and internationally to conserve the wetlands, promoting wetland research and database management, capacity building and securing financial resources for sustainable management of wetlands (MoE 2009). The NWP works around the principles of ecosystem and knowledge-based conservation and management of wetlands, equitable sharing of wetland resources, implementation of good governance and stewardship, transboundary coordination, stakeholder participation in managing the wetlands and no net loss of biodiversity in the wetlands in the long run upon implementation of the necessary policy and regulative measures for wetland management.

This policy also provides the strategies for action to meet the objectives of the wetland policy. The policy gives directives for enforcement of the National Environmental Quality Standards that aid in the monitoring of pollutants converging into the coastal wetlands from upstream activities (MoE 2009). It also addresses the issues caused due to climate change that directly affect the wetlands, especially the coastal wetlands.

### **27.3.4.3 National Forest Policy, 2010**

The National Forest Policy (NFP) of Pakistan provides a framework for sustainable management and conservation of forests and its resources. The objectives of the NFP are:

1. Restore and maintain natural forests.
2. Increase their productivity and function to improve the forest-dependent livelihoods.
3. Encourage the use of non-wood products and maximize wood substitutes.
4. Enhance carbon sequestration.
5. Develop sectoral forest management plans, tailored to conserve and protect the forest biodiversity and strengthen the forest education and research.
6. Encourage a collaborative and community-involved multi-stakeholder partnership for better management of the forest areas (MoE 2010).

The policy also focuses on improving the mangrove and riverine forests to protect the coastal and estuarine ecosystems, which serve as habitats for fish nurseries, shrimp and other coastal aquatic animals. The policy works towards reduction of pollution in the coastal forest areas, increased freshwater flow into estuaries to minimize seawater influence on coastal ecosystems and estuarine ecosystems and also reduction of the exploitation of the forest resources by the local communities for fuel and fodder (MoE 2010). For these measures, the policy encourages incentive-based management of coastal forest systems. The policy also recognizes the nation's commitment to international treaties that deal with wildlife conservation and emphasizes on the conservation and management of various aquatic habitats and their bioresources.

### **27.3.4.4 National Climate Change Policy, 2012**

The National Climate Change Policy (NCCP) was developed to provide the framework for addressing the issues that would be faced by Pakistan due to climate change. It covers the issues surrounding a wide range of sectors such as water, agriculture, forestry, coastal areas, biological diversity and other vulnerable ecosystems. The policy enunciates the threats the coastal areas would face due to the SLR and the increased cyclonic activity. The policy lists the preventive measures to safeguard the nation's coastal ecosystems by developing the natural barriers as well as raising artificial barriers, maintaining the water flow and reducing the pollution that affects the bay areas and promoting the sustainable use of the coastal wetland resources (MoCC 2012). These steps were not only focused on conserving the coastal wetland resources but also to secure the livelihood of the coastal communities that depend on the wetland resources. The policy was framed with the sound knowledge and assessment of climate change impacts.

### **27.3.5 Sri Lanka**

Sri Lanka has an array of policies for the protection of its valuable environmental resources, which aim at good resource management and socioeconomic development (UN 2015). The environmental policies, concerning coastal wetlands of Sri Lanka, are described hereunder.

#### **27.3.5.1 The National Forest Policy, 1995**

The NFP 1995 formulated by the Ministry of Agriculture, Lands and Forestry aims at managing the forests of Sri Lanka in a sustainable way and conserving them with regard to the biodiversity, soil and water of the forest as such and recognizes the historical, cultural, religious and aesthetic values associated with forestry resources (SFD 2011).

#### **27.3.5.2 National Wildlife Policy, 2000**

The National Wildlife Policy (NWP 2000) of Sri Lanka provides for conserving the wildlife resources through promoting conservation, maintaining ecological processes and life-sustaining systems, managing genetic diversity, ensuring sustainable utilization and equitable benefit sharing of biodiversity. It emphasizes the need for effective management of protected areas with the participation of local communities. In addition, it promotes the cooperation among all stakeholders through joint decision-making at all levels.

#### **27.3.5.3 National Environmental Policy, 2003**

This policy (NEP 2003) aims at promoting the sound management of Sri Lanka's environment, balancing the needs for social and economic development and maintaining the environmental integrity. It also aims to manage the environment by linking together the activities, interests and perspectives of the stakeholders and to ensure the environmental accountability (MoENRS 2003). Specifically, the application of the NEP is to focus on achieving certain outcomes, one of which is 'the wetlands, those that are of importance for their ecological functions are protected'.

#### **27.3.5.4 National Policy on Wetlands, 2006**

The formulation of the National Policy on Wetlands (NPW), 2006, is a major step taken by the Ministry of Environment and Natural Resources towards wetland conservation and protection by recognizing their cultural and economic importance to the people of Sri Lanka. The NPW signifies Sri Lanka's commitment to preserve the ecological values and functions of the country's wetlands. The main objectives of the NPW, 2006, are to protect and conserve the wetland ecosystems, prevent illegal utilization of wetlands, enhance the ecosystem services from wetlands, restore the biodiversity and productivity of wetlands, assure the sustainable use by local communities and meet the national commitments to Ramsar Convention (CEA 2006). As a management strategy, the policy states that all the wetlands would be zoned and classified with respect to their levels of ecological, utilitarian, international, national and local significance. It also emphasizes the need for bringing the



privately owned wetlands under the government fold through legal reforms. Importantly, the policy supports an integrated approach towards wetland management that involves participatory and collaborative processes. The policy also encourages research programmes that benefit the wetland conservation. The policy had led to the establishment of local level Wetland Management Committees (WMC) under the National Environment Act (NEA) to manage the wetlands with community and other stakeholder participation. It also laid the foundation for the formation of Wetland Facilitating Committees (WFCs) at division and district level (CEA 2006), the functioning of which will be monitored by the National Wetland Steering Committee (NWSC). The policy is supported by a strategy and action plan that explains the functions and responsibilities of each of the governmental and non-governmental institutions, involved in wetland conservation and sustainable management.

### **27.3.6 Appraisal of Wetland Conservation Policies in South Asia**

The South Asian countries have considered the challenges faced by their coastal environment from multiple dimensions, and each country has taken into account the issues of concern into their national policy framework. Based on the complexity of the issues surrounding their respective nation's coastal ecosystems, each state has attempted to address strategic measures to mitigate the effects on both natural and anthropogenic effects separately. All the five coastal South Asian nations have a policy framework, which tries to be in compliance with the international environmental policy guidelines to conserve and protect their respective coastal resources.

While Maldives does not possess a sectoral policy to address issues of their coastal wetlands, it has taken steps to address the threats affecting their environment and the ecosystems through their Climate Change Policy Framework. The CBD has declared the entire country of Maldives as United Nations Educational, Scientific and Cultural Organization (UNESCO) Biosphere Reserve, to be effective from 2017, in order to conserve and protect the natural resources, especially of the coastal environment, which is the major driving force for the island's economy.

Sri Lanka has addressed its commitment towards coastal wetland conservation through NFP, 1995, and NPW, 2006, thereby encouraging an integrated conservation of resources through research and education. The policies highlight the necessity of establishing national, district and local level administrative agencies.

Bangladesh's NWP, 1999, and the CZP, 2005, recognized the major threats to coastal wetlands and give directives for their management. The impacts of aquaculture activities on coastal ecosystems have been recognized, and zoning for aquaculture development to prevent their adverse impacts on the estuarine ecosystems has been suggested. In addition, these two policies focus on the environmental, social and economic development of the coastal resources and the livelihoods of those depending on the coastal ecosystems.

Pakistan has an array of policies, such as the NEP, 2005; the NWP, 2009; the NFP, 2010; and the NCCP, 2012, for addressing the aforementioned issues. All



these policies recognize and adhere to their commitment to international environmental agreements and emphasize the importance and effectiveness of integrated and collaborative environmental management. Pakistan has included the issue of climate change into their policy framework via the NCCP, 2012. It also prescribes the need for sustainable and balanced harvesting of wetland resources and advocates (IWRM) for improved management of the watersheds to ensure that the coastal wetlands are supplied with enough water to sustain their ecosystems, especially in the estuarine areas.

India has, in place, the NFP, 1988; National Conservation Strategy and Policy Statement on Environment and Development, 1992; and NEP, 2006, to conserve and protect the ecosystems of the coastal wetlands of India. All these policies aim at maintaining the environmental stability recognizing the ecological, economic and social values of the coastal wetlands. These policies support the concept of sustainable management of coastal wetland ecosystems by directing the agencies with respect to IWRM, identifying ecologically vulnerable ecosystems, which can be declared as protected areas for better conservation of ecosystem resources and promotion of stakeholder participation in environmental management.

The CBD requires all the countries to prepare their respective National Biodiversity Strategy and Action Plan (NBSAP) (or equivalent instrument) and to ensure that this strategy is mainstreamed into the plan addressing all activities of various sectors that could have an impact (positive and negative) on biodiversity. All the five South Asian countries have finalized their National Biodiversity Strategy and Action Plan or equivalent instruments. The states have updated their environmental conservation and developmental strategies in consonance with the Millennium Development Goals and the Aichi Biodiversity Targets.

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## **27.4 Legal and Regulatory Instruments for Wetland Conservation**

Each coastal South Asian nation has various legal instruments for conservation of wetlands and associated natural resources.

### **27.4.1 Bangladesh**

#### **27.4.1.1 Bangladesh Environment Conservation Act, 1995**

The Bangladesh Environment Conservation Act (BECA), 1995, provides for protection of the environment, improvement of the environmental standards and control and abatement of the pollution of the environment. This act provides for the establishment of Department of Environment by the government and also for declaring an area to be an ecologically critical area. According to the act, where the discharge of an environmental pollutant in excess of the limits prescribed by rules occurs, the person responsible shall be bound to prevent or abate the environmental pollution occurred (BMoEF 1995). It restricts establishment of industrial enterprise

by requiring them to obtain an environmental clearance from the director general of Department of Environment.

## **27.4.2 Maldives**

### **27.4.2.1 Environment Protection and Preservation Act of Maldives, 1993 (Law No. 4/93)**

The Environment Protection and Preservation Act of Maldives, 1993, lays down the basic principles and rules of environment protection in the Maldives. It is enacted to protect and preserve the country's land and water resources, flora and fauna as well as the beaches, reefs, lagoons and all natural habitats important for the sustainable development of the country. The act addresses the nation's concern on the harmful and hazardous impacts of disposal of wastes, oil and poisonous substances and toxic or nuclear wastes. It necessitates the assessment of environmental impacts for any developmental projects for the protection and preservation of its environmental resources.

## **27.4.3 India**

### **27.4.3.1 The Wildlife (Protection) Act, 1972**

The Indian Wildlife (Protection) Act (IWPA), 1972, was formed in the backdrop of the rapid decline of India's wild animals and birds, which in some cases have become endangered or extinct. This act has listed all the species, which need protection under six schedules, and each schedule has varying degrees of protection. The species in Schedule I and part II of Schedule II have the maximum protection, and exploitation of those species would result in highest penalty. The plants identified in Schedule VI are prohibited from cultivation and planting (MoEF 1972). Some of the coastal wetland wildlife that are rare and of high ecological importance such as corals, dugongs, sea cucumbers and crabs are listed under Schedule I. Further, the sponges (calcareous) and certain molluscs found in the marine environment are listed under Schedule III and IV, respectively. The act prohibits trade and commerce of scheduled species and provides powers to the empowered officers to function as per the directions given in the act. This act provides the state government the freedom to declare an area as a wildlife sanctuary within its territory if the area shows adequate ecological, faunal, floral, geomorphological, natural or zoological significance for the purpose of protecting, propagating or developing wildlife or its environment. Significant coastal wetlands that are demarcated as protected areas under the act are Gulf of Mannar Marine National Park in Tamil Nadu, Mahatma Gandhi Marine National Park, Wandoor in Andaman and Nicobar Islands, Sundarbans Tiger Reserve (STR) in West Bengal and Gulf of Kachchh (GoK) in Gujarat.

### 27.4.3.2 Environment (Protection) Act, 1986

The Environment (Protection) Act (EPA), 1986, is considered as an umbrella legislation, which provides the framework to implement the decisions made at the 1972 Stockholm Conference and aids in overseeing the activities of various regulatory agencies under the existing laws and legislations and creation of authorities to govern the environment. This act encourages sustainable development and prohibits those activities that affect human environment and health. Moreover, this act sets standards for the quality of environment with respect to various aspects and lays standards for emission or discharge of environmental pollutants (MoEF 1986). The regulatory instruments of direct relevance to wetlands under the EPA, 1986, are Wetlands (Conservation and Management) Rules, 2010; Coastal (Regulation) Zone (CRZ) Notification, 2011; and Island (Protection) Zone Notification, 2011.

*Wetlands (Conservation and Management) Rules, 2010*, were drafted keeping in mind the need for conserving and protecting the wetland resources of the country. This is a measure taken in recognition of India's commitment to the Ramsar Convention (MoEF 2010). The wetlands that were identified and require regulation are (1) wetlands of international importance under Ramsar Convention; (2) ecologically sensitive wetlands of importance such as mangroves, coral reefs and areas of outstanding natural beauty and historical or heritage significance, wetlands recognized under UNESCO World Heritage Sites; and (3) inland wetlands that are at high elevation (high-altitude wetlands) and also those spread over 500 ha. The rules list out the activities that are prohibited, regulated and permitted, but with caution that they do not cause any detrimental damage to the wetland ecosystems such as aquaculture, agricultural and horticultural activities, construction of jetties and other authorized activities (MoEF 2010).

*Coastal Regulation Zone (CRZ) Notification, 2011*, replaces the thither to CRZ, 1991, and was notified with specific objectives of ensuring the livelihood security of coastal communities, conserving and protecting coastal areas and encouraging sustainable development based on scientific ecological principles. For the purpose of regulation, the CRZ notification has classified the coast into four zones, CRZ I–IV (MoEF 2011a). CRZ I brings under its fold the ecologically sensitive areas and includes various coastal wetlands, while CRZ IV refers to the water and seabed up to the territorial limit on the seaward side and includes the tidally influenced waterbodies. The notification focuses on regulating developments and implementing measures to abate pollution from land-based activities, coastal erosion and other forms of coastal environment degradation (MoEF 2011a).

*Island Protection Zone (IPZ) Notification, 2011*: The IPZ, 2011, was drafted specifically to protect and regulate the natural resources of the two island groups of India: Andaman and Nicobar Islands and Lakshadweep Islands. This notification was framed to give special importance to the complexly unique island ecosystems, as they were treated equally with the mainland coastal ecosystems. The management plans for the island groups are of two categories: (i) Integrated Island Management Plan (IIMP) and (ii) Island Coastal Regulation Zone (ICRZ). The ICRZ is the categorization of the coastal area into four regulative zones: ICRZ I–IV. This ICRZ applies only to the islands of Middle Andaman, North Andaman,

South Andaman and Greater Nicobar. The other islands of Andaman and Nicobar, along with the islands of Lakshadweep, are managed by IIMP (MoEF 2011b). The notification provides guidelines for developing the IIMP and lists the permitted, regulated and prohibited activities in both the island groups with the objective of conserving and protecting their pristine coastal ecosystems.

### **27.4.3.3 Biological Diversity Act, 2002**

The Biological Diversity Act was enacted in the year 2002 with the objective of conserving biodiversity, sustainable use of its components and fair and equitable sharing of the benefits of the bioresources. The act recognizes the richness of India's biological diversity and the duty entailed upon the government to protect them, as well as to show their commitment to the CBD (MoEF 2002). The act focuses on sharing the benefits of the bioresources and sustainable utilization of their genetic resources, at the same time protecting the resources from unauthorized exploration and exploitation, especially by foreigners or an organization that is not incorporated or registered in India.

## **27.4.4 Pakistan**

### **27.4.4.1 Pakistan Environmental Protection Act, 1997**

The Pakistan Environmental Protection Act (PEPA) was enacted on the 06th of December 1997, based on series of consultations with stakeholders as a measure to adopt a sustainable method of development through participatory approach (PEPA 2012). The objectives of this act are to protect, conserve, rehabilitate and improve the environment, prevent and control pollution and promote sustainable development.

## **27.4.5 Sri Lanka**

### **27.4.5.1 National Environmental Act, 1980 (No. 47 of 1980)**

The National Environmental Act (NEA), 1980, of Sri Lanka led to the establishment of the Central Environmental Authority (CEA), whose key functional duties are to recommend to the minister the national environmental policy and the criteria to be taken into account for protection of the environment; to undertake surveys and investigations; to conduct, promote and coordinate research; to specify standards and methods to be adopted in taking samples and making tests; to provide information and education to the public; and to promote, encourage and coordinate long-range planning in environmental protection and management (GoS 1980). It requires every project, referred as prescribed project, to submit an Environmental Impact Assessment (EIA) report, which would be subjected to public inspection followed by public hearing for approval of the project (Azmy 2013).

### **27.4.5.2 Coast Conservation Act, 1981 (No. 57 of 1981)**

The Coast Conservation Act (CCA), 1981, was enacted with an aim of surveying the coastal zone of Sri Lanka and preparing a Coastal Zone Management Plan (CZMP) to regulate the developmental activities along the coast. The act defines the coastal zone of the country as the area lying within 300 m landward of the mean high water line, and in the case of rivers, streams, lagoons or any other body of water connected to the sea, either permanently or periodically, the landward boundary shall extend to a limit of 2 km perpendicular to the strait baseline drawn between the natural entrance points thereof and shall include waters of such waterbodies (GoS 1981).

The CZMP addresses the issues concerning the coastal regions of Sri Lanka such as coastal erosion, loss and degradation of coastal habitat, as well as loss and degradation of archaeological, historical and cultural sites and recreational scenic areas. The CZMP was designed to adapt sustainable use of coastal environment and their resources in the long term while supporting the national development goals.

### **27.4.5.3 National Heritage Wilderness Areas Act (No. 3 of 1988)**

The National Heritage Wilderness Areas Act (NHWAA) was enacted for preserving the ecosystem, the genetic resources in their natural state and also the physical and biological formations by precisely delineated areas. It also covers the habitats of threatened species of animals and plants (GoS 1988). The act requires identification and mapping of the wildernesses for better management and protection and details the activities prohibited within such area. It also provides directions for the treatment of protected areas. It has the provision to acquire lands for the purpose of this act through the Land Acquisition (Amendment) Act, 1964.

### **27.4.5.4 Fauna and Flora Protection (Amendment) Act 2009 (No. 22 of 2009)**

The Fauna and Flora Protection Ordinance, dating back to 1937, was the first law enacted to provide protection to habitats in order to conserve the wildlife, including indigenous wild plants and animals, and protect them from commercial exploitation (GoS 1993). It provided for establishment of national reserves and sanctuaries and related matters and classifying the national reserves as strict natural reserves, national parks, nature reserves, marine national parks, jungle corridors or intermediate zones. Apart from this, the ordinance has the provision to protect certain species of fauna outside reserves. The ordinance was subjected to four amendments until 1945 and was made as an act in 1949 – the Fauna and Flora Protection (Amendment) Act 1949 (No. 38 of 1949). Since then the act has been amended five times, the latest being in the year 2009, which deals with the control and management of national reserves, offences relating to amphibians and fishes and prohibitions on import or export of protected animals without permits. The act includes the list of species that are protected under this act and are categorized under eight schedules (I–VIII) with respect to their degree of protection (GoS 2009).

### **27.4.6 Appraisal of Legal Instruments for Wetland Conservation in South Asia**

The governments of the respective states of South Asia have enacted various acts to aid in proper governance of the environment, as per the enabling policy frameworks and commitment to international environmental laws. Maldives, through their Environment Protection and Preservation Act, 1993, has set standards for monitoring, conserving and protecting its environment. It also provides guidelines and the measures to be taken for protecting the coastal ecosystems.

The Government of Sri Lanka has legal and regulatory framework to protect its natural resources. They aim at conserving and maintaining the beauty of the natural resources and wilderness and encourage scientific research for effective science-based protection and management of natural resources. They also contain strict rules on exploitation of aquatic resources within their jurisdiction to conserve the flora and fauna of the ecosystems. In addition, to upgrade the level of protection, the ministries governing their respective ecosystems have the power to declare an area as a protected area. The concept of ICZM was also adopted by the Sri Lankan government.

Bangladesh and Pakistan have enacted the BECA, 1995, and the PEPA, 1997, respectively. These acts address the issues and concerns faced by the environment of their respective countries and have incorporated the concepts of environmental protection that were adopted in various international forums. The BECA focuses on mitigatory measures for containing the pollution affecting the country's environment. The purpose of the act is to abate the biodiversity loss through protecting and conserving their ecosystems, and more specifically the coastal ecosystems, which contribute significantly towards the country's economy. Pakistan, also, through their relevant acts provides directives for conserving its natural resources, particularly to maintain and enhance the country's biodiversity. Both the countries promote the concept of sustainable development through their acts, coherent with the objectives of their national policies.

India has a robust legal framework to conserve, protect and manage the environmental (coastal) resources, the significant ones being the Wildlife (Protection) Act, 1972; the Forest (Conservation) Act, 1980; the EPA, 1986; and the Biological Diversity Act, 2002. Further, under the EPA, 1986, the Wetland (Conservation and Management) Rules, 2010, and the CRZ Notification, 2011, have also been notified with specific mandates. The regulatory provisions recognize the interdependency of different ecosystems and species and how a slight imbalance would cause the degradation of the ecosystems, especially the coastal ecosystems due to their complex relationship between different coastal wetland ecosystems.

## **27.5 Institutional Mechanism for Wetland Conservation in South Asia**

### **27.5.1 Bangladesh**

The BECA, 1995, provides for the establishment of the Department of Environment, headed by the Director General, who in turn, for the purpose of enforcing the provisions of the act, coordinates with other concerned authorities or agencies. The act empowers the government to declare an area as ecologically critical area based on science-based evidences.

### **27.5.2 India**

The Wildlife (Protection) Act, 1972, provided for establishment of the Wildlife Advisory Board for every state and union territory. It enables the government to appoint the director of Wildlife Preservation and the assistant director of Wildlife Preservation for enforcing the provisions of the act. The act also empowers the Chief Wildlife Warden to exercise the regulations and provisions under this act.

The EPA, 1986, empowers the central government to establish authorities [under Section 3(3)] with the mandate of preventing the environmental pollution in all its forms and to tackle specific environmental problems of different parts of the country. The CRZ Notification, 2011, issued under the EPA, 1986, resulted in the formation of the National Coastal Zone Management Authority, as well as the State Coastal Zone Management Authorities and district level committees. The Coastal Zone Management Authority (CZMA) has the duty to examine and issue permissions for the development of permissible activities as per the CRZ notification in various zones. The CZMA is also responsible for the enforcement of the Island (Protection) Zone Notification, 2011.

The Wetland Conservation and Management Rules, 2010, provide for constituting the Central Wetland Regulatory Authority under the Ministry of Environment, Forest and Climate Change. The authority can appraise proposals for identification of new wetlands and projects upon consultation with the local authorities. It assists the state governments in conservation, preservation and wise use of wetlands. It also reviews the list and the status of wetlands periodically and details the prohibited and regulated activities.

The *Biological Diversity Act, 2002*, established the National Biodiversity Authority (NBA) to aid in the implementation of the act and regulations under it. The NBA is an autonomous body that governs the status of the biodiversity and prevents any unauthorized exploration or exploitation of natural resources. It is also responsible for the intellectual property rights for any research-based innovation related to biodiversity from India.



### **27.5.3 Maldives**

The Ministry of Planning, Human Resources and Environment of Maldives is the authority enforcing the Environment Protection and Preservation Act of Maldives, 1993. The ministry oversees the legislative recommendations of the act and enforces the rules and penalties for efficient coastal resource management and governance. The Ministry has the liberty to identify, protect and enforce regulatory measures to marine protected areas within its jurisdictional waters.

### **27.5.4 Pakistan**

The PEPA, 1997, established the Pakistan Environmental Protection Council that is chaired by the prime minister of the country. The council is responsible for framing and enforcing the regulations for the protection of the environmental resources. The council also drafts the National Environment Report. A Federal Environmental Protection Agency was established to exercise the powers and functions under the provisions of the PEPA. The act mandates every provincial government of Pakistan to establish an Environmental Protection Agency, headed by the Director General. The act provides for the establishment of environmental tribunals to hear the cases relating to violation of the act. In addition, the act provides for creation of a Provincial Sustainable Development Fund for funding various measures taken under different provisions of the act.

### **27.5.5 Sri Lanka**

The CEA was established under the NEA, 1980. The Ministry of Environment administers the act. The act also led to the establishment of the Environmental Council, whose members are appointed by the Minister of Environment. The act provides for the formation of the District Environmental Agency. The functions of the CEA are to recommend to the Ministry of Environment on relevant issues and oversee the implementation of the regulatory provisions under the act. The CEA also provides directives to the District Environmental Authority and overlooks the functioning of the authority as defined by the act.

The Coast Conservation Act, 1981, is administered by the Coast Conservation Department under the Ministry of Fisheries and Aquatic Resources. The act established the Coast Conservation Advisory Council (CCAC), whose function is to provide suggestions and advices to the minister in charge on the coastal activities and developments. The council also reviews the CZMP that promotes sustainable development of the coast of Sri Lanka. The Fauna and Flora Protection Ordinance, 1993, is administered by the Department of Wildlife Conservation, and the minister in charge has the privilege to declare an area as national reserve upon reviewing scientific research and biosurvey evidences. This act is administered at the local level by the municipal council and the urban council.



The Forest Department is the administering authority of the National Heritage Wilderness Areas Act, 1988. The Minister of Environment declares an area as a National Heritage Wilderness Area upon consultation with the Ministers of Wildlife Conservation, Fisheries, Agriculture, Cultural Affairs and of the Indigenous Medicine. This act has given the authority to the minister to frame regulations for the National Heritage Wilderness Area.

A summary of the institutional structures for implementation of the relevant acts in different South Asian countries is given in Table 27.4.

**Table 27.4** Institutional structure for implementation/enforcement of the provisions of different acts in the coastal states of South Asia

Country	Acts	Institutions
Pakistan	Pakistan Environmental Protection Act, 1997	Pakistan Environmental Protection Council
		Environmental tribunal
Bangladesh	Environment Conservation Act, 1995	Department of Environment
Sri Lanka	National Heritage Wilderness Areas Act, 1988	Forest Department
	National Environmental Act, 1980	Central Environmental Authority
		Environmental Council
		District Environmental Agency
	Coast Conservation Act, 1981	Coast Conservation Department
Fauna and Flora Protection Ordinance, 1993	Department of Wildlife Conservation	
	Municipal Council	
	Urban Council or <i>Pradeshiya Sabha</i>	
Maldives	Environment Protection and Preservation Act of Maldives, 1993	Ministry of Planning, Human Resources and Environment
India	Wildlife (Protection) Act, 1972	Wildlife Advisory Board
	Forest Conservation Act, 1980	Committee Constituted by the Government
	Environmental (Protection) Act, 1986	Ministry of Environment, Forest and Climate Change and Environment Departments in the coastal states
	Wetland (Conservation and Management) Rules, 2010	Central Wetland Regulatory Authority
	Coastal Regulation Zone Notification, 2011	National Coastal Zone Management Authority
	Island Protection Zone Notification, 2011	National Coastal Zone Management Authority
	Biological Diversity Act, 2002	National Biodiversity Authority

## 27.6 Conclusion

The South Asian region is rich in biological diversity, especially in the marine environmental realm. The countries recognize the importance of their coastal resources as they form the livelihood basis for a large proportion of their population. The countries undertake different modes of action to prevent deterioration of the quality of coastal wetlands. Every country possesses specific legislative and policy frameworks, which address and regulate the concerned resources/activities to minimize the threats to the environment and natural resources. Additionally, they all have given importance to the natural disasters that frequently hit the coastal regions of South Asia, due to climate change.

However, a comparative regional assessment makes it clear that there are voids to be filled by each country in addressing their issues relating to their coastal wetland management. Though all the South Asian countries have defined their coastal boundaries, India is the only country among the five coastal states of South Asia, which has demarcated and mapped the coastal zones for better regulatory purposes. India has incorporated the concept of ICZM into its policy framework and is currently pursuing ICZM in certain areas in a phased manner. India is also a pioneer in drafting notifications under the relevant acts to intensify the degree of regulations governing the coastal zone. While environmental standards, as for air quality and water quality, are defined, no such standards are defined for each of the coastal ecosystems that are needed to be maintained for the purpose of long-lasting sustenance of the ecosystem. In addition, the growing demand for development needs have, in many cases, set aside environmental priorities though it is also seen that many local initiatives (supported at the national and international levels) are steadily working towards recovery of anthropogenically stressed wetlands. Measures such as environmental impact assessments, public consultations and education and awareness have helped a great deal in this.

Although the countries have legislations to govern the coastal wetlands, there are overlaps of executive functions due to the involvement of multiple governing authorities/agencies, which has hampered implementation of the provisions of the regulations by the enforcing authorities that govern the coastal regions. There are many reasons that compound the resource depletion in the South Asian region which need to be addressed and resolved.

Some areas of concern with respect to the implementation of the conservation measures of the acts and policies by the respective implementation authority are:

1. Involvement of multiple agencies at various levels of the government which creates ambiguity in roles and responsibilities of different functionaries
2. Transboundary nature of some resources
3. Differential perspectives on the need for environmental conservation and sustainable development among different stakeholders
4. Lack of reliable data on the value of coastal wetlands
5. Financial limitations
6. Inadequate representation of local community in environmental decisions

## 7. Insufficient national level educational programmes on environmental conservation and protection

To address these issues, countries require sufficient financial support for improvization of technologies, undertaking research on natural resources and institutionalization of programmes and approaches for coastal management. The South Asian countries have the advantage of strengthening their cooperation in various fields, due to common interest, to address these issues related to coastal governance, by sharing experiences and expertise, and thus secure the coasts for the future.

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