UNIT 12 CONSERVATION OF WATER BODIES

Structure

12.1 INTRODUCTION

Most of the Indian rivers, such as the Ganga, Yamuna, Godavari, Krishna, Sone, Cauvery, Damodar and Brahmaputra and their tributaries are extremely contaminated because of the release of untreated sewage and industrial effluents into these rivers. For instance, the Ganga alone gets sewage from 29 (class I) urban communities situated on its banks and industrial effluent of more than 300 industrial units all through its entire journey of about 2,525 km. Similarly, the river Yamuna has additionally been undermined by contamination in Delhi and the Ghaziabad zone. Around 5,15,000 kiloliters of untreated sewage are released into the river Yamuna daily. Apart from this, there are around 1,500 medium and small industrial units which additionally contribute enormous measures of untreated wastewater to the river Yamuna every day.

Similarly, numerous different rivers were studied in the past decades concerning their pollution status and most of them were found polluted. Since, the 1980s, the Government of India made up several genuine efforts for checking water contamination of the river Ganga and other significant rivers of India. The significant action is the Ganga Action Plan. Conservation of water bodies is a continuous and ongoing process. Presently, several

programmes are running in the country for the conservation of water bodies. In this unit, we will be discussing the National River Conservation Plan and the features of the Ganga Action Plan Phase-I and Phase-II. This unit will also provide an overview of the National Mission for Clean Ganga. Further, we will be discussing the features of the Wetland (Conservation and Management) Rules, 2010 and the National Wetland Conservation Programme.

12.2 OBJECTIVES

After studying this unit, you should be able to:

- describe the National River Conservation plan of India;
- explain the Ganga Action Plan Phase-I and Phase-II;
- explain the features of the National Mission for Clean Ganga;
- explain the features of the Wetland (Conservation and Management) Rules, 2010;
- describe the National Wetland Conservation Programme; and
- explain the Coastal Zone Regulation.

12.3 NATIONAL RIVER CONSERVATION PLAN

In 1985, the Government of India started its river pollution control program with the start of the Ganga Action Plan (GAP). After that, the GAP Phase II started in 1993 to control pollution of the river Yamuna and Gomati and major tributaries of the river Ganga. The river pollution mitigation program was further expanded to include other major rivers of the country in 1995 under the aegis of the National River Conservation Plan (NRCP). In December 1996, GAP Phase II was also merged with the NRCP and all projects related to river conservation in the country were brought under one plan of NRCP.

Objectives of NRCP

The main goal of the plan was to reduce the pollution load in Indian rivers through the use of different pollution control measures, resulting in improvement in river water quality. NRCP was a central government-funded plan launched in 1995, the main goal of the plan was to mitigate the pollution of rivers. The main purposes of the plan include the construction of STPs, river development, low-cost sanitation, and afforestation.

NRCP covers 38 rivers in 178 cities from more than 20 states. The sewage treatment capability of almost 4064 million litres per day (MLD) has been set up. River activities for sewage disposal and management were also introduced into other plans like the Jawaharlal Nehru National city-based renewal & development plan for small and medium towns. Conservation of rivers comprises whole approaches of the central and state governments.

The central government helped in all the efforts of the state governments to overcome river pollution. Based on the supervising system followed by institutions on some of the main rivers under NRCP, the water pollution in terms of BOD (Biochemical Oxygen Demand) values has improved at most of the locations as compared to water quality before implementing the pollution control measures. The central government, in February 2009, set up the National Ganga River Basin Authority (NGRBA) which has the powers to initiate financial planning, supervising and coordinating authority to make sure of effective pollution control measures for the river Ganga. Discharge of untreated wastewater contributes to the pollution load for the rivers. Drawing water for agricultural practices, industrial use, drinking purpose, power plants for electricity generation and other uses additionally gives the challenge to keep the adequate flow rate in the rivers and cleansing them. Diversion of sewage and installation of sewage treatment plants (STP) is the foremost aim of pollution control under the plan (NRCP). The concept of NRCP is to enhance the water quality of Indian rivers by strict implementation of pollution control measures because rivers are the lifelines of any country. Conservation of rivers is a continuous and ongoing process. Later in June 2015, an Integrated Ganga Conservation Mission, namely "Namami Gange" has been approved as a 'Flagship Programme' set up to accomplish effective abatement of pollution, conservation and rejuvenation of the river.

The pollution mitigation measures taken up under the NRCP scheme are:

a) Interception and diversion of sewerage systems to collect sewage water flowing into the rivers through drains and diverting them for treatment.
b) Installation of sewage treatment plants for treating the diverted sewage.
c) Building of public toilets to control open defecation on river banks.
d) Building of electric crematoria and improving wood crematoria.
e) Riverfront development practices, i.e., development of river ghats.
f) Public awareness and participation.

State governments and local bodies are responsible for the proper treatment and disposal of sewage. Central government supporting the efforts of state governments through the NRCP plan of MoEF&CC, NGRBA/Namami Gange plan of MoWR, RD&GR and AMRUT/Smart cities plans of MoUD.

12.4 GANGA ACTION PLAN PHASE –I (GAP-I)

The river Ganga is worshipped by millions of Indians, because of its purity and spiritual values, but now it is one of the most polluted rivers in India. It is so polluted that in some parts of the river, the water doesn't fit even for bathing purposes, especially in the summertime. It starts from the Gangotri glacier, around 4100 meters above ocean level. The river flows through the Himalayas and combines with other streams at Devprayag. The Ganga basin is the dominant river basin of the country covering approximately 40% population of India. The Ganga after travelling a distance of around 2,525 km

from its origin, then falls into the Bay of Bengal. During its journey from the hills to the Bay of Bengal, a large amount of sewage from sewage treatment plants and effluent treatment plants and wastes from many other sources are discharged into the river increasing pollution. This scenario is unacceptable because it is a common practice for the Indians to take a bath in the 'holy' water of the Ganga. Similarly, a large number of people live along the river that uses the river water for drinking and other living purposes. The livelihoods of many humans like fishermen, boatmen and monks are also linked to the water quality of the river Ganga.

Objectives of Ganga Action Plan Phase - I (GAP-I)

The main goal of the GAP was to improve the water quality of the river Ganga up to acceptable standards by preventing pollution, but later, the goal of the GAP was changed to restoring the river water quality to the "Bathing class".

Table 12.1 Towns covered in the Ganga Action Plan Phase-I

State	Town
Uttar Pradesh	Mirzapur, Haridwar, Faridabad, Fatehgarh, Allahabad, Kanpur and V
Bihar	Chapra, Bhagalpur, Munger and Patna.
West Bengal	Naihati, Kamarhati, Bharampore, Nabadwip, Hugli Chinsura, Ser Chandan Nagar, Bally, Kalyani, Bhatpara, Titagarh, Howrah, H CalcuttaandBaranagar.

Box 12.1 Ganga and GAP in Kanpur

Kanpur became the key participant of GAP because of its huge pollution levels. Nearly, Rs.730 million had been invested for GAP phase I in Kanpur city for mitigation of pollution load. The overall sewage generated in Kanpur at the time of the starting of the GAP was around 285 MLD out of which 162 MLD of sewage were diverted to sewage treatment plants for treatment under phase I.

The objective of treatment plants was to mitigate the 162 MLD of home/domestic sewage and 9 MLD of tannery effluent generated from one hundred seventy-five (175) tanneries and transport the treated wastewater to the villages for irrigation purposes. Four intermediate pumping stations had been constructed alongside the Ganga, and all wastewater drains had been interrupted and diverted to the pumping stations. The pumping stations were to transfer the wastewater into a common waste pipe leading to the main pumping station, which filters out solid waste and then pumps the remaining wastewater into three sewage treatment plants. Two of these sewage treatment plants (5 MLD & 130 MLD) treated domestic wastewater, using

sedimentation after aerobic treatment and anaerobic stabilization. Another plant, with a capability of 36 MLD integrated with the Dutch technology (known as UASB) was also constructed. This plant used anaerobic microorganisms to decompose the waste substances and needed a few amounts of post-treatment. This plant was supposed to treat the tannery effluent, with the idea that the chromium and different heavy metals from this effluent should be recovered and recycled at the manufacturing unit. Various initiatives had been undertaken perfectly, including cleaning of sewers, enlargement of the sewer system, installation of electric crematoria, and the setup of low-price sanitation systems.

12.5 GANGA ACTION PLAN PHASE –II (GAP-II)

The GAP I was continued as GAP II from 1993. GAP II includes four main tributaries of the Ganga, which are Yamuna, Gomati, Damodar and Mahanadi. As GAP I addressed only a part of the pollution load of Ganga, GAP II was launched in stages between 1993 and 1996. Under GAP-II, 59 towns along the main stem of the river Ganga in five States of Uttarakhand, U.P., Jharkhand, Bihar and West Bengal are covered. In GAP-II, Yamuna and Gomati action plans have been approved in April 1993. Plans for the other rivers were also permitted in 1995 under NRCP; in December 1996, it was decided to combine GAP II and NRCP.

The program has become vast in 1995 with the addition of other rivers and the GAP was renamed NRCP. The remarkable achievements of GAP were the use of appropriate technologies for sewage treatment such as Upflow Anaerobic Sludge Blanket (UASB), sewage treatment with the help of plants, upgraded oxidation ponds, aquaculture with the usage of duckweeds and pisciculture etc. The technologies were cost-effective in terms of operation & maintenance. The cost-effectiveness of these technologies helped to make GAP and plans sustainable.

Monitoring System for GAP

The action plans are monitored at both the State as well as Central government levels through a multi-level monitoring system.

State Level

i) Detailed monitoring by a group of technically sound people on daily basis.

ii) Monthly review of the progress by the Chief Executive of the nodal association.

iii) Local people are included in the monitoring committee to audit the advancement and give contributions to public participation and association.

iv) A regular survey by the divisional project monitoring cells.

v) A timely study of advancement of the plan by a state guiding council driven by the concerned Chief Secretaries.

vi) Overall consistent audit by a high-powered committee under the chairmanship of the chief minister.

Central Level

i) Regular communication and audit by NRCD authority, including regular site visits. Regular review by the NRCD project director.

ii) The quarterly survey of advancement by a steering committee headed by the Secretary of the ministry. Chief Secretaries of the concerned states and experts in public health engineering and other related areas are the members of this committee.

iii) Quarterly review of the progress of scientific and technical aspects of the programme as well as the impact of works on the river water quality by a monitoring committee headed by member environment, planning commission.

iv) Quarterly review by a standing committee headed by the Union Minister of Environment & Forests.

v) Annual review of progress by the National River Conservation Authority led by the Prime Minister. The concerned Chief Ministers of the states and individuals from this Committee.

Check Your Progress 1

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the unit.

1. Write a short note on Ganga Action Plan Phase-I (GAP-I).

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2. Write a short note on Ganga Action Plan Phase-II (GAP-II).

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12.6 NATIONAL MISSION FOR CLEAN GANGA

National Mission for Clean Ganga (NMCG), a society registered under the Societies Registration Act, 1860, is an authority created under the river Ganga (Rejuvenation, Protection and Management) authorities order, 2016 by the government of India. NMCG is a nodal service for effective mitigation of pollution and rejuvenation, protection and management of the river Ganga and its tributaries. The states have a river Ganga basin, specifically, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, Haryana, Rajasthan, West Bengal, Delhi and tributaries of the river Ganga are covered under this mission.

NMCG approved the planning, financing and execution of projects to overcome the contamination in the river Ganga, including the development of a sewerage system, treatment of chemicals released from numerous industries, catchment area treatment, flood control, creating public awareness and participation programs, conservation of oceanic, riparian life and biodiversity and such other measures for sustainable river management. NMCG also facilitated, screened and survey the utilization of various projects and exercises taken up for prevention and control of contamination, safety and management in the river Ganga and its tributaries.

12.7 GANGA KNOWLEDGE CENTRE

River Ganga has important economic, ecological and social values in India. The river travels a distance of approx 2,525 km from the Himalayas to the Bay of Bengal. The Ganga basin, which is spread out into parts of Nepal, China and Bangladesh, represents 26% of India's landmass, 30% of its water assets and over 40% of its population. The Ganga is one of India's holiest rivers whose social and cultural values rise above the limits of the basin. The Ganga Knowledge Center is set up at National Mission for Clean Ganga to discover the issues and to improve the nature of the execution of the National Ganga River Basin Authority (NGRBA) program. The Ganga Knowledge Center is an autonomous information-based organization which supports advancement and partner cooperation to enhance the investments of NGRBA. The Ganga Knowledge Centre is situated in Delhi and is a part of the NMCG. It will have a physical presence on the Ganga and topical focuses on subjects like dolphin conservation, ecological diversity, flora, fauna, industrial pollution, hydro-power etc.

Objectives and Scope of Ganga Knowledge Centre

a) To make and oversee learning assets.

b) Inspection and analysis of data relevant to the river Ganga.

c) To develop and inquire about improvement through recognizable knowledge gaps, the need for new ideas and support focused on research.

d) To encourage partners through public participation and building

partnership with colleges/educational/research institutes of national and international repute and NGOs.

e) The Ganga Knowledge Center is an organization which produces the condition of specialized learning even while considering always conventional and local knowledge.

f) Knowledge-based items include distributions, on the website, virtual information bases and e-library.

g) Sharing the improved vision across agencies.

The main functions of the Ganga Knowledge Centre are:

a) Collection of real-time information to work as an observing centre.

b) The key function of the Ganga Knowledge Center is to make and keep up, an excellent web-based interface for the Ganga, a data focus (MIS) on all major Ganga projects, a GIS-based mapping arrangement of the Ganga basin, a process for supporting new thoughts and procedures for connecting with partners through occasions, publications and online media.

12.8 NATIONAL LAKE CONSERVATION PLAN

Analyzing the significance of lakes, MOEF&CC, the Government of India, started the National Lake Conservation Plan (NLCP), a Central government-funded plan mainly focused on maintaining the quality of lake water and the ecology of the lakes in the territories of the nation. The plan was approved by the government of India during the IXth Plan (June 2001) as a 100% Central government grant. The funding pattern for NLCP has been changed in February 2002 from 100% central funding to 70:30 cost sharing between the central and the concerned state government. The primary objective of the plan is to re-establish and preserve the urban and semi-urban lakes in the nation which are highly contaminated due to wastewater released into the lake and other wastewater sources.

Activities under NLCP

To prevent the contamination from point sources by intercepting, redirecting and treating the contamination entering the lake. The interferences may incorporate sewage treatment for the entire lake catchment area.

a) In situ measures of lake cleaning like de-silting, de-weeding, bioremediation, bio-manipulation, nutrient reduction, air circulation etc.

b) Catchment area treatment may incorporate afforestation, stormwater drainage, sediment traps etc.

c) Lake fencing and shoreline development.

d) Lake eco-development programmes, including public participation.

e) Solid waste management & provision of Dhobi Ghats (washing areas)

was generally not secured under NLCP.

f) Prevention of pollutants from non-point sources.

g) Public awareness and public participation.

h) Training and research for lake conservation.

Lake Selection Criteria

Hydrological Criteria

a) The lake water body is enduring i.e., it holds a certain volume of water at all times, even in the lean period of the year.

b) Physical parameters of the lake are: (i) Lake size > 10 Ha (Exception: lakes larger than 3 Ha having social, cultural or religious importance) (ii) Lake depth (maximum depth) > 3 m

Scientific Criteria

The lake is prioritized by the concerned state government or if the water body is highly contaminated/degraded and cannot be put to its traditional use, primarily because of the discharge of domestic and industrial wastewater into the lake &dumping of municipal solid waste.

Funding for the NLCP

a) 70% of project expenses were supported by the Government of India and the remaining 30% of the project cost was supported by the state government, of which the share of the local body would be up to 10% to ensure public participation in the project. A commitment to this impact too to be provided by the state government.

a) Part of the lake where sewage treatment is being supported by other sources. In case, the proposal also includes the internal sewerage as one of the components; the funding pattern shall be 60:40 between the centre and the respective state. As far as possible, government land may be identified for the creation of infrastructure.

b) The Operation & Maintenance (O&M) are a part of the project and the costs are borne entirely by the States for which additional resources have to be demonstrably raised and committed to O&M. The O&M Plan must reveal the dedicated streams for revenue generation to meet O&M expenses and the same has to be passed as a resolution by the concerned local body.

c) If there is a cost overrun in a project because of the delay, inflation or any other reason, the contribution of the government of India shall be limited to the amount initially agreed to in the administrative approval & expenditure sanction order.

In February 2013 the National Lake Conservation Plan (NLCP) has been merged with another scheme of the National Wetlands Conservation Programme (NWCP) to avoid overlap and promote better synergy into a new integrated scheme of the National Plan for Conservation of Aquatic-ecosystems (NPCA) for holistic conservation and restoration of lakes and wetlands in the country.

Check Your Progress 2

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the unit.

1. What are the major activities of the National Mission for Clean Ganga (NMCG)?

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2. Write a short note on Ganga Knowledge Center.

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12.9 THE WETLANDS (CONSERVATION AND MANAGEMENT) RULES, 2010

The Ministry of Environment and Forests notified the Wetlands (Conservation and Management) Rules, 2010. These rules have been drafted by the Ministry of Environment and Forests to ensure better conservation and prevent the degradation of existing wetlands in India. These rules came into force on 4th December 2010.

Wetlands are essential for human progress and prosperity, especially in India, a large number of individuals depend on them for drinking water, food and livelihood. The wetlands are among the most degraded biological systems in the world. Research study suggests that 1/3rd of India's wetlands have been wiped out due to excess fishing, discharge of industrial effluents, fertilizers and pesticides, uncontrolled siltation and weed invasion. Wetland protection is the need of the hour in India. National Wetlands Conservation Program of India has been financially supporting wetland safeguarding techniques all

over India. 115 wetlands have been identified for conservation and management to date in this program. Under the Ramsar convention, there are 27 wetlands of India, which are involved in the wetlands of global significance.

Essential features of the Wetlands (Conservation and Management) Rules, 2010

- The Wetlands (Conservation and Management) Rules, 2010 is to reduce and prohibit the degradation of wetlands in India. Its objectives are wetland conservation, wetland protection, and wetland management to ensure that no further degradation of wetlands takes place in India.
- The rules indicate the exercises which are degrading the wetlands such as industrialization, developmental activities, dumping of untreated sewage and solid waste etc. The rules forbid these exercises within the wetlands.
- The Central Wetland Regulatory Authority has been set up to guarantee appropriate execution of the Rules and performs all functions for the management of wetlands in the nation. Apart from fundamental government delegates, the Authority shall have various expert members to ensure that wetland preservation is done in the most ideal way.
- The rules have classified the wetlands to ensure wetland protection, and its easier identification and management.
- The activities, for example, harvesting, dredging and so on might be done in the wetlands, but only after consent from the concerned authorities.
- To avoid confusion, it was referenced in the rules that if the wetlands are present inside the protected zones of the National Parks and Wildlife Sanctuaries they will be managed by the regulations of the Wild Life (Protection) Act, 1972.
- The Wetlands (Conservation and Management) Rules, 2010 was a necessary step to promote wetland protection and conservation in India.
- The Wetlands (Conservation and Management) Rules, 2010 has been amended in 2016 and again in 2017. The new Wetlands (Conservation and Management) Rules, 2017 replaced the Wetland (Conservation and Management) Rules, 2010.

12.10 NATIONAL WETLAND CONSERVATION PROGRAMME

The National Wetlands Conservation Programme (NWCP) has been merged in February 2013 with National Lake Conservation Plan (NLCP) into a new scheme “National Plan for Conservation of Aquatic Ecosystems” (NPCA) to avoid overlap and better collaboration. NPCA goes for the preservation and reclamation of wetlands and lakes for achieving the ideal water quality, besides progress in biodiversity and biological communities through an

incorporated and multidisciplinary approach. Around 115 wetlands in 24 states and two Union Territories are recognized for protection under the NPCA/NWCP.

The Ministry has guided state governments through a series of gatherings held in November 2013 and in October 2014 for the preparation of Comprehensive Management Action Plans for seeking financial help and for coordinated administration of lakes and wetlands. The activities required by the states are with respect to the following:

a) Identification of priority wetlands.

b) Construction of wetland boards.

c) Development of coordinated administrative plans.

d) Securing assets for implementation of management plans.

e) Strengthening legal and administrative aspects.

f) Proper monitoring and assessment.

g) Strengthening research practices.

About nine states (Orissa, Karnataka, Bihar and Kerela) have officially set up State wetland/lake authorities for appropriate conservation. Specific lake authorities like Chilka Development Authority, Loktak Development Authority, Wullar Conservation and Management Authority and East Calcutta Wetland Management Authority have additionally been set up by the separate State Governments.

12.11 COASTAL REGULATION ZONE

There is an urgent need to protect the coastal ecosystems and habitats by executing the coastal regulation zone notice. A sound coastal life needs an understanding and proper planning of the environment, on and nearby the coast. Maybe with these perspectives, the Ministry of Environment and Forest, Government of India issued a notice in the year 1991, beneath the Environment (Protection) Act of 1986, declaring coastal extends as a coastal regulation zone and controlling activities in it.

India has a coastline of around 7516 km long and around 4198 islands are there along the shores of the Andaman, Nicobar and Lakshadweep groups. The coastal zone consolidates the zone between the high tide line (HTL) and low tide line (LTL), up to 10 maritime miles towards the ocean side from HTL and up to 20 km from HTL towards the land side. The precise boundary of the shoreline is critical for planning purposes. The prime imperative of the coastal regulation zone plan chart is basically to manage coastal and coastal zone features for sustainable use by outlining high and low tide lines on the chart with the assistance of hydrographic surveys.

For the conservation of resources by controlling their exhaustion and managing developmental activities, the Government of India proclaimed the

Environment (Protection) act 1986. The Ministry of Environment and Forest has informed in February 1991, that the coast extends from HTL to 500 meters towards land and from HTL to LTL towards the sea as a coastal regulation zone (CRZ).

The CRZ notification has put an excessive number of limitations on the advancement along the coast. In Maharashtra, with its coastline of 720 km and 54 river creeks, noteworthy stretches of land are hit by the CRZ notice. It is representing a few issues previously the planners and decision-makers on one side and investors and developers on the other. Various critical issues of CRZ notification and suggestions engaged with the way toward planning and improvement are:

a) Demarcation of High tide line (HTL) in the coastal control zone warning is characterized as the line up to which most noteworthy high tide comes in spring tides. It is delineated by remote sensing data.

b) Demarcation of the low tide line is the limit up to which the lowest tide retreats during spring tide. This line would be arrived at by making a bathymetric graph of the coastal region with the datum of the graph being the least low tide.

c) In the case of rivers, CRZ notification and resulting Supreme Court judgment have stipulated that if the width of the stream is up to 350 meters, the CRZ will be 100 meters from the creek and if the width surpasses 350 meters, it will be 150 meters from the brook. Presently where to measure the separation of 100 meters or 150 meters is a point of debate. Another point in the appreciation of the creek is up to what distance inside the brook, the CRZ notice will be regulated. Some specialists have opined that distance in the river, where the tidal impact of the wave arrives at an end, ought to be considered as the distance inside the creek for deciding the coastal zone.

d) It is stipulated that if there should arise an area of mangrove with a territory of $1000m^2$ or more, would be named CRZ with a buffer zone of no less than 50 meters. The mangrove is a tropical tree developing, along the coastline and requires saline water for its development.

Coral reefs are vital encouraging grounds for fish. Mangrove and coral reefs act as a buffer zone against wave and tidal power, for balancing out and protecting the coast. Before making the CRZ outline, the best possible assessment of the coastal features and their accurate measurement is essential.

Apart from systematizing the 25 amendments that were made to CRZ notice during 1991-2009, the CRZ notice (2011) has a few new highlights: It has exceptional arrangements for Goa, Kerala, Greater Mumbai and critically vulnerable coastal regions like Sundarbans mangrove area, Sunderland Mangrove, Chilka and Bhitarkanika (Orissa), Gulf of Khambat and Gulf of Kutch (Gujarat), Malwan (Maharashtra), Karwar and Kundapur (Karnataka),

Vembanad (Kerala), Coringa, East Godavari and Krishna Delta (Andhra Pradesh), East Godavari, Gulf of Mannar (Tamil Nadu).

Water zones up to 12 nautical miles in the sea and the entire water zone of the tidal water body, i.e., stream, river, estuary and so on, would presently be consolidated into the CRZ zones management plan, without pushing any limitations of angling activities. The thought of a Coastal Zone Management Plan, to be established with the fullest commitment and support of local communities, has been introduced.

To control developmental exercises, the coastline extends inside 500 meters of HTL on the landward side and is described in the following four various classes of coastal regulation zones.

i) Category I (CRZ-I): The zones that are naturally sensitive and significant, i.e., national parks, sanctuaries, reserve forests, wildlife habitats, mangroves, coral reef areas close to the breeding ground of fish and marine life, Historical heritage areas, and regions subject to be submerged due to rise in sea level because of global warming. It covers the areas between HTL and LTL.

ii) Category II (CRZ-II): The areas that have recently been created up to and near the shoreline. Created areas are referred to as that territory within the municipal limits assigned urban region which is now significantly developed and which has been furnished with waste and approach streets and other foundation offices, for example, water supply and sewerage mains. Some advancement on the landward side of the present road/street and proposed road/street that appeared on the coastal zone management plan are allowed in this category.

iii) Category III (CRZ-III): The commonly undisturbed regions and those which don't have a place with either classification I or II. These will include seaside zone in the rural regions (developed and undeveloped) and also regions inside municipal limits or legally assigned urban areas, which are not essentially created.

iv) Category IV (CRZ-IV): Coastal stretches in the Andaman and Nicobar, Lakshadweep and little islands except those assigned as CRZ-I, CRZ-II and CRZ-III.

Check Your Progress 3

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the unit.

1. What do you understand by coastal regulation zone? What is its importance?

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2. Mention the four categories of coastal zones as per CRZ notification.

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3. Enlist some activities under NLCP for the prevention of pollution from point sources.

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4. How many wetlands are under the Ramsar Convention in India? What is the significance of wetlands?

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5. Why National Lake Conservation Plan was merged into National Wetlands Conservation Programme?

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12.12 LET US SUM UP

In this unit, we have discussed the National River Conservation Plan and key features of the Ganga Action Plan Phase-I and Phase-II. The Central Government set up the "National Ganga River Basin Authority" in 2009 for

the river Ganga, to ensure effective abatement of pollution. National Mission for Clean Ganga was also constituted for effective control of water pollution and rejuvenation, protection and management of the river Ganga and its major tributaries. Under this mission, no untreated municipal sewage and industrial effluent are to be discharged into the river Ganga. Later in June 2015 an Integrated Ganga Conservation Mission, namely "Namami Gange" has been ratified as the flagship programme to achieve effective abatement of pollution, conservation and rejuvenation of the river. For the conservation of lakes, the Government of India started the National Lake Conservation Plan in June 2011. The plan mainly focused on maintaining the quality of lake water and the ecology of the lakes. In 2013, the National Lake Conservation Plan has been merged with the National Wetlands Conservation Programme to avoid overlap. Wetlands conservation is very essential as they protect and improve water quality, provides fish and wildlife habitats, control floods by holding water like a sponge and maintains surface water flow during dry periods. The Ministry of Environment and Forests drafted Wetlands (Conservation and Management) Rules, 2010 for better preservation and to prevent the degradation of existing wetlands in India.

12.13 KEY WORDS

Wetland: Wetland means an area 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, but does not include river channels, paddy fields, human-made water bodies/tanks specifically constructed for drinking water purposes and structures specifically constructed for aquaculture, salt production, recreation and irrigation purposes.

Wetlands Complexes: Wetlands complexes mean two or more ecologically and hydrologically contiguous wetlands and may include their connecting channels/ducts.

ABBREVIATIONS

NRCP	:	National River Conservation Plan
GAP	:	Ganga Action Plan
MLD	:	Million Liters per Day
BOD	:	Biochemical Oxygen Demand
NGRBA	:	National Ganga River Basin Authority
STP	:	Sewage Treatment Plant
MOEF & CC	:	Ministry of Environment, Forest and Climate Change
MOWR, RD&GR	:	Ministry of Water Resources, River Development and Ganga Rejuvenation

AMRUT	:	Atal Mission for Rejuvenation and Urban Transformation
MOUD	:	Ministry of Urban Development
UASB	:	Up-flow Anaerobic Sludge Blanket
NMCG	:	National Mission for Clean Ganga
NLCP	:	National Lake Conservation Plan
NPCA	:	National Plan for Conservation of Aquatic Ecosystems
NWCP	:	National Wetland Conservation Program
CRZ	:	Coastal Regulation Zone

12.14 SUGGESTED FURTHER READING/REFERENCES

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Web Links

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12.15 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1. Please refer to section 12.4

2. Please refer to section 12.5

Check Your Progress 2

1. Major activities of NMCG are to approve the planning, financing and execution of projects to overcome the contamination in the river Ganga. Besides this, the development of sewage treatment plants, catchment area treatment, flood control, creating public awareness and participation programs, conservation of aquatic life and such different measures for sustainable river management are the other activities of NMCG.

2. The Ganga Knowledge Centre is situated in Delhi, and is a part of the NMCG. The centre is set up to improve the nature of the execution of the National Ganga River Basin Authority (NGRBA) program. The key function of the Ganga Knowledge Center is to make and keep up, an excellent web-based interface for Ganga, a data focus (MIS) on all major Ganga projects, a GIS-based mapping arrangement of the Ganga basin, and a process for supporting new thoughts and procedures for connecting with partners through occasions, publications and online media.

Check Your Progress 3

1. Please refer to section 12.11

2. Please refer to section 12.11

3. To prevent contamination from point sources, the following activities can be recommended in the lake catchment areas.

   a) In situ measures of lake cleaning like de-silting, de-weeding, nutrient reduction, air circulation etc.;

   b) Afforestation in the catchment area to reduce soil erosion and trap sediments;

   c) Lake fencing and shoreline development;

   d) Lake eco-development programmes;

   e) Public awareness and public participation; and

   f) Training and research for lake conservation.

4. Currently, 27 wetlands of India are under the Ramsar convention. Wetlands are essential for human progress and prosperity, a large number of individuals depend on them for drinking water, food and livelihood.

5. Please refer to section 12.10