LEGAL CONTROLS ON THE USE OF INLAND WETLANDS

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INTRODUCTION

Inland wetland ecosystems are cradles of biological diversity. They provide water and primary productivity. Countless species of plants and animals depend for their survival in these areas[1]. Inland wetlands include different types of land situated between marine wetlands and forest wetlands. A comprehensive definition of inland wetlands is lacking. Analysis of *Ramsar* definition and the Wetland (Conservation and Management) Rules, 2010[2] gives a picture of the areas covered under the term. Understanding the term 'inland wetland' is highly necessary to make a proper study of inland wetlands. Improper use or abuse of inland wetlands leads to several disasters to the ecosystem and environment. Causes of deterioration are to be analysed to devise a mechanism for control of wetland degradation. Some Central and state legislation is based on the conservation and protection of inland wetlands. However, there is a lack of comprehensive legislation in this area. Certain provisions under those legislations help to protect these areas. These provisions lack a comprehensive approach. There is a need to identify legislative measures to prevent the threats and to upgrade these areas. Specifically, the protection of rivers, river beds, river banks, and lakes is assuming great importance as primary sources of drinking water for the increasing population. Sand mining has become a major problem. Despite strong controls, this menace continues. Administrative and legislative measures bearing on the inland wetlands need an analysis. Various enforcement mechanisms adopted under these legislations also need a critical approach. Contributions of judiciary to these attempts are also examined under the study.

Land cover changes, deforestation, habitat fragmentation, pollution, indiscriminate disposal of liquid and solid wastes are issues related to economic productivity and ecological security of inland wetlands. All these have led to the degradation of inland wetlands. Structural changes are brought in the inland wetlands due to land use changes. This has influenced the functional aspects such as hydrology, bio-geo chemical and nutrient cycle[3]. These changes are evident in many regions.

[1] Sushanta Mahapatra and Sudip Mitra, "Managing Land and Water under Changing Climatic Conditions in India: A Critical Perspective", 3 *Journal of Environmental Protection* (2012), pp.1054-1062.
[2] The Wetland\(Conservation and Management) Rules, 2010 was issued under the Environment (Protection) Act, 1986 under ss. 3 and 25.
[3] Natural Resource Defence Council, "Annual Report 2007," Natural Resource Defence Council, Sanfranisco(2007)

Conversions changed recurrent streams to seasonal and sometimes have led to disappearance of water bodies. This makes serious water crisis. Changes are also brought in the biological diversity of the areas. Hydrological changes could bring in climate change[4] too. Due to this snowmelt and evaporation rates increases. Droughts, storms and floods intensify. Much of the hydrological changes will be reflected in changes in freshwater ecosystems including most of the inland wetland areas. These cumulatively affect the biodiversity and habitat of various organisms[5] in these areas. Conservation of natural resources through sustainable ecosystem management and development is the key to our secured future. Formulation and implementation of action plans that best conserve inland wetland resources require an understanding of issues, concerns and threats to water resources.

As per the *Ramsar* definition[6] wetlands are areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salty including areas of marine water, the depth of which at low tide does not exceed 6 meters. It may also incorporate riparian and coastal zones adjacent to the wetlands and islands or bodies of marine water deeper than 6 meters at low tide lying within the wetlands. From this definition, it is clear that wetland originally indicates the areas of intermediate character. It means a character between deep water and terrestrial habitats. This is transitional. The flora and fauna of these areas are adapted to such shallow flooding and waterlogging of ground. Thus, these can include riparian[7] areas, flood plains of rivers, river banks and shoreline beds of rivers, freshwater lakes, freshwater swamps, reservoirs, and large ponds. These types of wetlands are classified as inland wetlands. They are defined by soil type. The soil types of wetlands are poorly drained, very poorly drained, alluvial, and floodplain[8]. These wetlands may not always appear wet. These inland wetlands are very precious and their economic value is very high[9]. But in India, these areas experience high pressures from various fields. Thus, their protection is in dilemma. Centre and states have enacted

[4] F. Soltau, "Climate Change and Sustainable Development: Understanding the Linkages", 30 *Natural Resources Forum* (2006), pp. 253-255.

[5] World Bank, "Climate Change Impacts in Drought and Flood Affected Areas: Case Studies in India" Social, Environment and Water Resources Management Unit, India Country Management Unit (South Asia Region), New Delhi, Report No. 43946 (2008)

[6] See the *Ramsar Convention* Art.1.1

[7] Wetlands that are present along the rivers and streams called riverine or riparian wetlands. Their water supply depends on the precipitation in upstream areas and ground water inflow to the stream.

[8] J. Disano, "Climate Change and Sustainable Development", 30 *Natural Resources Forum* (2006), pp. 251- 252.

[9]G. H. Brundtland, "Development and International Economic Co-Operation: Environment", Report of the World Commission on Environment and Development, Tokyo (1987).

various legislations for the same. But this could not bring any remedy to the existing situation. Thus, this chapter attempts to address the issues relating to inland wetlands.

TYPES OF INLAND WETLANDS IN INDIA

As per the definition of inland wetlands from the *Ramsar* convention[10] they fall under number of categories. The Dover Conservation Commission[11] a wetland protection guide defines inland wetlands to include bodies of water such as lakes, streams and rivers, land always covered with water such as marshes and swamps and land that is covered by water for part of the year such as vernal pools[12]. Based on the above classification inland wetlands available in India can be categorized as

I) Rivers and Allied Ecosystems

The river[13] channels and riparian vegetations, flood plains and river mouths associated with river provides diverse habitat for a variety of aquatic and terrestrial species and also provide important ecological services. Wetlands of river occur in estuaries also. River valleys, river basins, river beds and banks are the most productive and biologically diverse inland wetlands[14]. Drainage basin of river acts like a funnel collecting all the water within the area covered by the basin and channelling it into a waterway [15]. Thus this area also forms part of inland wetlands. The mouth of a river is a good place for fishing. In this place along with the alluvium, a river swills out many

[10]http://www.environment.gov.au/water/wetlands/ramsar/wetland-type-classification accessed on 2 March 2013 Permanent inland deltas and permanent rivers**,** includes waterfalls**,** whether seasonal intermittent or irregular. Permanent freshwater lakes (over 8 ha); includes large oxbow lakes**,** Seasonal or intermittent freshwater lakes (over 8 ha); includes floodplain lakes, permanent saline lakes**,** seasonal or intermittent saline lakes and flats**,** permanent saline marshes or pools**,** seasonal or intermittent saline marshes pools**,** permanent freshwater marshes or pools; ponds (below 8 ha), marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season, Seasonal or intermittent freshwater marshes or pools on inorganic soils; includes sloughs, potholes, seasonally flooded meadows, sedge marshes, Non-forested peat lands; includes shrub or open bogs, swamps, fens, Alpine wetlands; includes alpine meadows, temporary waters from snowmelt, Tundra wetlands; includes tundra pools, temporary waters from snowmelt, Shrub-dominated wetlands; shrub swamps, shrub-dominated freshwater marshes, shrub Carr, alder thicket on inorganic soils, Freshwater, tree-dominated wetlands; includes freshwater swamp forests, seasonally flooded forests, wooded swamps on inorganic soils, Forested peat lands; peat swamp forests, Freshwater springs; oases, Geothermal wetlands and Karst and other subterranean hydrological systems are inland wetlands

[11] http:// www.state.ma.us./dep see also http:// doverma.org/codes.html visited on 07-07-2015

[12] T.N.Narasimhan, "Water Law for India: Science and Philosophy Perspectives", in R.Ramaswamy Iyer (edt.) *Water and the Laws in India*, Sage Publications India Pvt. Ltd., New Delhi India (2009), p.537.

[13] A river is natural watercourse. Usually fresh water is available in this area. It flows towards the ocean, a lake, a sea, or another river. In a few cases river flows into the ground and vanishes from the surface.

[14] The Mint Newspaper "*Threat to Rivers" (* June 5, 2010)

[15] Michael J. Wiley and W. Paul, *An Introduction to Rivers — the Conceptual Basis for the Michigan Rivers Inventory Project*, Seelbach Publication (1997), p. 7

different species into the lake or sea. Thus it forms a peculiar ecosystem supporting the activities of various types[16].

II) **Lakes**

Lakes are another ecosystem that comes under inland wetlands[17]. According to the Little Oxford Dictionary 'lake' means large body of water surrounded by water[18]. In India, MoEF has defined a lake under the National Lake Conservation Programme[19]. Lakes are "standing water bodies which have a minimum water depth of 3m, generally cover a water spread of more than ten hectares, and have no or very little aquatic vegetation".

However, there is no classification of lakes in India. Based on the Geographical location they are generally categorised as Himalayan lakes, peninsular lakes, and coastal lakes. According to limnological criteria lakes are categorised as freshwater lakes and brackish water lakes. Ephemeral lakes such as lakes of the Ganga-Bramputra basin such as Beels and Jheels also present in India. Their functional criteria can also be one of the methods of classification. Along with lakes certain ecosystems covered under the regions near the lakes also fall under the term inland wetlands. They are i) Shallow lakes and ponds such as vernal ponds, spring pools, salt lakes, and volcanic crater lakes[20].

ii) Bogs are waterlogged peat lands. They are nutrient-poor and acidic in conditions. They have developed their own unique flora[21]. Thus, they offer an undisturbed habitat for a wide range of species[22].

iii) Marshes and Swamps known as palustrine wetlands[23] also form part of inland wetlands in India. These marshes, swamps, and fens account for half of all wetlands throughout the world. But these water bodies are polluted heavily and their restoration is very difficult to be achieved[24].

[16] Sushanta Mahapatra, Sudip Mitra, 3 *Journal of Environmental Protection* (2012), pp.1054-1062
[17] R. Manivanan, *Water Quality Modeling: Rivers, Streams and Estuaries*, New India Publishing (2008), p. 114.
[18] The little oxford dictionary of current English(7th edn., 1994).
[19] Here in after referred to as NLCP
[20] Ghassemi and Fereidoun, *Inter-basin water transfer*, Cambridge University Press, Cambridge (2007).
[21] Gorham E., "The development of peatland", Quarterly Review of Biology, Vol.32 (1957), pp. 145–66
[22] A.I. Solomeshch , The West Siberian Lowland, in L.H. Fraser and P.A. Keddy (eds.), *The World's Largest Wetlands: Ecology and Conservation*, Cambridge University Press, Cambridge, UK (2005),Pp. 11-62.
[23] P.A.Keddy , *Wetland Ecology: Principles and Conservation*, Cambridge University Press, Cambridge, UK (2nd edn., 2010), p.497.
[24] L.H. Fraser and P.A. Keddy (eds.), *The World's Largest Wetlands: Ecology and Conservation*, Cambridge University Press, Cambridge, UK (2005).

THREATS TO INLAND WETLANDS

More than half of the wetland areas disappeared due to human-oriented activities in wetlands[25]. These include direct extensive and intensive users, exploiters who dredge sediments or exploit mineral resources, agricultural producers who drain and convert wetlands to agricultural land, water abstractors who use wetlands as a source of drinking or irrigation water, human settlements expansion, and indirect users who benefit from flood control use of the wetland[26].

Rivers are indeed facing numerous environmental problems. Most of the rivers are polluted and are unsuitable for basic community needs such as fishing and swimming[27]. Pollution of drinking water and freshwater of rivers and lakes are top two environmental concerns[28]. Along with industries non-point sources of pollution also cause a great threat to rivers[29]. Thus, the inland wetlands face multi-facial problems[30].

Watershed degradation, deterioration in water quality, alteration in hydrology, and shoreline modifications are the other problems faced by these inland wetlands[31]. Human alters the hydrology and shoreline of the inland wetlands through landfill, beautification, and intensive aquaculture. An increase in aquatic crop cultivation and uses for religious and recreational purposes[32] add to these threats.

Sand mining excelling the capacity of river basins and consequent degradation of river is another major threat. Despite many measures adopted through legislation, administrative measures and judicial decisions this menace continues unabatedly all over India. For the last two decades, inland wetlands have been victims to unplanned urbanization in India. This results in pollution, encroachment, eutrophication, illegal mining activities, ungoverned tourist activities and cultural

[25] A. Vaidyanathan, "Interlinking of Rivers I", *The Hindu,* (26 March 2003). See also A. Vaidyanathan, "Interlinking of Rivers II", *The Hindu,* (27 March 2003).
[26] R. R. Iyer, *Water Perspectives: Issues, Concerns,* Sage Publications of India Pvt. Ltd., New Delhi (2003).
[27] K.L. Rao, "India's Water Wealth: Its assessment, Uses and Projections" New Delhi (1975), p 54.
[28] B. R. Sharma and V. U. Smakhtin, "Water Harvesting as a Strategic Tool for Drought Mitigation in Southwest Asia", *Proceedings of* 55*th International Meeting of the International Commission on Irrigation and Drainage*, FAO/ICID International Workshop on Water Harvesting and Sustainable Agriculture, Moscow(2004).
[29] Central Pollution Control Board, Water Quality in India: Status and Trends 1990-2001 (2002).
[30] V. R. Krishna Iyer, "Nature's Gifts: A Case for Safeguarding Rivers, Sand and Other Natural Resources"' In: S. Yadav(Ed.), *Water Problem and Its Management,* Hope India Publications, Haryana (2004).

[31] J. Bandyopadhaya, "Water Management in the Ganges- Brahmaputra Basin: Emerging Challenges for the 21st Century", 11 *Water Resources Development* (1995), pp. 411-442

[32] Workshop Resolution from the Indian National Workshop on Environment Flows, New Delhi (23-24 March, 2005), see also Issue of Environmental Flows, 2 International Water Management Institute (2005).

misuse of these precious ecological systems[33]. Thus the major threats to inland wetlands can be categorised to following heads.

i) *Pollution:* Population explosion took place in the last three decades. But there was no consequent increase in the civic facilities and waste disposal mechanisms. Without this more and more migration takes place to cities. The urban civic services are unable to meet this increase[34]. This consequently affects the inland wetlands. Now most of them are used for disposing untreated local sewage and solid waste. In many cases the water bodies have been ultimately turned into landfills.

ii) *Encroachment:* Encroachment is another major threat to inland wetlands. This is more particular in urban areas. Migration to cities affects the scarce land resources. Land has turned to be most precious speculative commodity rather than a common resource. Hence the ecosystem services gave way for real estate mafia. Both for the government and the private builders make use of this situation to encroach the land under wetlands[35].

iii) ***Deforestation*:-** Land use changes and conversion of watershed area has altered the hydrological regime. It enhanced the silt movement and lowered water yield in the catchment. It also affected the groundwater recharge. Large-scale deforestation in the Western Ghats and introduction of plantation crops in highlands replaced the natural vegetation. It reduced the storage capacity of soil and resulted in surface soil erosion in watersheds and sedimentation in rivers[36]. This has affected summer flow in rivers. Some perennial rivers have become seasonal in the last few decades due to large scale land cover changes.

iv*) Eutrophication:* Most of the inland wetlands are closed water bodies. A large part of the substances that enter in the lakes become a permanent part of the system. Only a part of this can be removed depending on the water exchange system. The entries of nutrients through raw sewage become the part of lake system. It causes various destructive changes in the wetlands such as prolific growth of aquatic weeds in lakes and ponds that ultimately disturb and kill the ecology of the water body[37]. All rivers in India are highly polluted due to inflow of untreated domestic, industrial wastes and agriculture runoff. Most of the industries are near the thickly populated

[33] United Nations, "World Water Development Report: Water for Life, Water for People", UNESCO (2003), p. 544

[34] V. Paranjpye, "The Value and Politics of Water in India", In: S. Kothari, I. Ahmad and H. Rifled (Eds.), *The Value of Nature—Ecological Politics in India*, Konrad Adenauer Stiftung, Rainbow Publishers Ltd., New Delhi(2003).

[35] Charkoplake in Maharashtra, Ousteri Lake in Puducherry, Deeper Beel in Guwahati are well known examples of encroachment. Another interesting example by the government itself is Pallikaranai marshland once a bird sanctuary, it is now the dumping yard of Chennai City. The dumping of solid waste, sewage discharge, and construction of new buildings such as a railway stations and a new road have shrunk this wetland to a great extend. Today, Pallikaranai wetland is also one of Chennai's largest official dumping sites. Similarly, the case of government encroachment of Sola Beel in Guwahati where the state revenue department allotted lake-bed for construction in spite of Guwahati High Court's order to protect all wetlands in the state

[36] V. R. Devi , Miranda and P. K. Azis., "Deterioration of Water Quality- An overview on the Pollution Problems of the Ashtamudi Estuary", 15 Poll. Res. Journal (1996) , Pp. 367-370

[37] Bheels of Assam, water hyacinth are well known examples exotic species introduced.

riversides, often near cities and towns. There is no efficient water treatment system in industries and city municipalities. Pollution level in some of the sites is far above permissible limits.

v) *Illegal Mining Activities:* Illegal mining for building material such as sand and stones both on the catchment and on the bed of the wetlands extremely damages wetlands[38].

Sand quarrying in rivers and watersheds are killing the rivers[39]. Such activities lead to river bank erosion, lowering of water table and create a number of environmental problems[40]. Ground water level in some of the watersheds has gone down by nearly one meter in the last two decades[41]. Agricultural practices in the riverbanks and also inside the dry riverbeds during non-rainy months also add to bank erosion and sedimentation in rivers[42].

vi)*Unplanned Tourism Activities:* Inland tourism has acquired greater momentum today. Activities without systematic planning and regulation proved to be another major threat to urban water bodies. Disturbance of wildlife, pollution, changes in local lifestyles and loss of cultural heritage are some of the impacts of tourism on the local environment. In the absence of garbage disposal facilities, the practice of dumping garbage into nearby water bodies has become quite common in recent years and has contributed to the degradation of many inland wetlands. Dal Lake in Srinagar, Tso Morari and Pongsho Lakes in Ladakh where the unplanned and unregulated tourism has posed long-term negative impacts both on biodiversity of the area and as well as on the local environment.

vii) *Land Reclamation and Construction*: Sand filling of ponds, lakes and other inland wetlands affects natural water flow and groundwater recharge. Construction of new roads and buildings has blocked many canals, which were important for navigation and freshwater. Vast areas of inland wetlands have been converted into settlement and industrial areas in the recent times[43].

viii) *Cultural Misuse:* Adding to the sorry state of urban water bodies is also the misuse of these water bodies by local communities for their cultural or religious festivals. These activities are particularly a source of serious pollution in lakes.

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[38] Basamand Lake in Jodhpur, once the only source of drinking water for the city of Jodhpur, has been suffering from illegal mining for the last 20 years despite the court's order to stop mining in 1999. Surajkund lake in Haryana is another example of illegal mining activities that have destroyed the lake

[39] See The National Green Tribunal order dated Aug 05 2013 New Delhi. Also see the order of Supreme Court in *Deepak Kumar* v. *State of Haryana*, A.I.R.2012 S.C.1386 apex court said that "sand mining is one of the causes for environmental degradation and a threat to biodiversity"

[40] http://www.downtoearth.org.in/content/swami-and-sand-mafia visited on 10-10-2014

[41] G.K.. Nair, "Indiscriminate Sand Mining Creates Water Shortage in Kerala", The Hindu Business Line(1st Feb. 2011).

[42] B Viju , "Raiding the River", The Times of India, New Delhi (19th June 2011).

[43] http://www.livemint.com/Politics/lor7YfKMp389ZqAWzFU9IM/Green-tribunal-bans-sand-mining-without-clearance.html?utm_source=copy visited on 18-12-2013

LEGISLATIVE MEASURES FOR PROTECTION OF INLAND WETLANDS IN INDIA

Traditionally Indian society shared collective responsibility in protecting the water bodies. After the independence government took the role of protecting these bodies. Constitutional provisions and mandate of public trust doctrine upheld by judiciary cast on them the duty to protect and preserve water bodies[44]. This shift from community ownership to government ownership proved to be detrimental to the very existence of the wetland areas. Several legislations operate in the field of conservation of these water bodies. Quite a few government departments with conflicting interest also operate based on these legislations. Public health, irrigation, water supply, urban development, tourism, environment and forest are some among them.

The National Water Policy, 1987 and Subsequent Policies

Various policy measures were adopted by national and state governments to protect the wholesomeness of water. The National Water Policy, 1987[45] was one of such attempt. It was an orderly document and its structure and contents were vast. It covered the aspects of water as a limited and valuable national resource, human environment and ecology. After the adoption of the National Water policy an official-level body was constituted by government of India. This was named as the National Water Board and its duty was to find ways of implementation of Indian water policy. A revised version of the same was announced in 2002[46]. It had an altered outlook. It recognized the role of private sector participation and the need for a standard shift from resource development to efficient utilization of the developed resources. Earlier policy was a wholly informal government exercise, with no consultations with people and institutions outside. Two reasons for failure of the 2002 water policy were in relation to water harvesting and community management of water. Important controversies such as those relating to water as "commodity" versus water as "commons" or a "basic right" and the desirability of water markets were ignored[47]. The new water Policy adopted in 2012[48]. Under this due consideration is given to the holistic approach needed for the sustainable development of water resources. There is a realisation that rather than treating water as a single unit an ecological approach is the need of the hour. It says that all the elements of the water cycle, i.e., evapotranspiration, precipitation, runoff, river, lakes, soil moisture, and groundwater and sea are interdependent and the basic hydrological unit is the

[44] *M.C.Mehta v. Kamal Nath* (1997)1 S.C.C. 388

[45] See the National Water Policy, 987, Ministry of Water Resources(987) for reference see http://cgwb.gov.in/documents/nwp_1987.pdf accessed on 11-06-2012

[46] See the National Water Policy, 2002, Ministry of water Resources, Government of India(2002). For reference see http://cgwb.gov.in/documents/nwp_2002.pdf visited on 11-06-2012

[47] *Supra n*. 28

[48] See the National Water Policy 2012, Ministry of water Resources, Government of India(2012). For further reference see http://www.dowrorissa.gov.in/ActsnPolicies/NWP/2012/NationalWaterPolicy2012.pdf accessed on 11-06-2012

river basin, which should be considered as the basic unit for planning[49]. It also stresses the need for river basin authorities for a holistic approach towards development.

Water Policy of Kerala 2008 and Land Use Controls

The existing water policy of Kerala was formulated before the new National Water Policy 2012. The Kerala water policy was formulated in 2008[50]. The water policy of Kerala tries to address various problems emerging from the use of water from the rivers. It addresses the problem of protection of river basins. However, the approach is not holistic. However, a mention regarding the protection of this vulnerable area can be observed in the policy. Another aim of the policy seems to be the optimum utilization of the resources in or concerning water bodies[51]. But always the problem is that how the protection and sustainable utilisation can go hand in hand meeting the aspirations of the community and the protection of the environment. The policy itself suggests that to achieve this measure there should be a master plan regarding the resources management in each river basin and micro water basins. Then it will become the basis of development in the state regarding the integrated approach of land and water resources. Every plan relating to the resources in the rivers can be done only with an environmental impact assessment. It should be environment friendly and sustain the ecology[52]. Thus, the participatory approach from the stakeholders and from every level of society becomes necessary. The planning envisages the involvement of various departments involved in the management of various sectors. The correlation between the central and the state government is also highly necessary to meet the challenges[53].

Legislations Bearing on Land Use Controls in Inland Wetlands

Water is a state subject[54] and states have the competence to make laws, formulate and implement plans and schemes for development of water resources for water supply, irrigation and hydropower. Several States have enacted laws relating to water. But, most of these laws do not address the present concerns in the water resources sector, in a holistic manner.

[49] *Ibid*., preamble
[50] See the Kerala Water Policy, 2008, Water Resource Department, Kerala(2008). For further reference see http://www.ksidc.org/WaterPolicy2008.pdf accessed on 11-06-2012
[51] *Ibid*., Rationale of the Water Policy , 2008
[52] *Ibid.*, Basic Strategies of the Water Policy, 2008
[53] *Ibid.*, Objectives of the Water Policy, 2008
[54] See the Constitution of India, Schedule VII, List II, Entry 17 Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of entry 56 of List I.

The current legislations governing the protection of rivers are many[55]. During British period River Conservancy Act (Madras Act IV of 1884)[56] was enacted for the protection of rivers. This was an Act to regulate the use of land within the river banks rather than the river itself. But later legislations reflected only water conservation and its management rather than the related land system associated with the river. There are clear conflicts between the existing legislations[57] and the societal outlook regarding development. If the provisions of the Acts are strictly implemented it would really go against the aspirations of the society. Thus mass violations occur regarding the implementation of the Act[58]. The land and sand mafia has acquired greater momentum by the increase in the value of land and its allied resources. Any measures adopted by the government to curb the menace of depletion of resources have resulted in loss of life of many people.

Since independence number of attempts has been made by the parliament to protect river beds and banks. The first attempt at river bed management was through an Act of parliament[59]. It had the most comprehensive mandate among all such organisations[60]. But it failed in achieving its objectives. Consequent to that Government passed Brahmaputra Board Act, 1980[61]. It is done with an aim of comprehensive development of river ecosystem[62]. But no River Boards under the Act have been formed. Later in 1976 Betwa River Board was set up through Betwa River Board Act. Brahmaputra Board was set up under an Act of the Parliament[63]. It was set up under the Ministry of Water Resources, covering the Brahmaputra and the Barak Valleys for planning, investigation and implementation of water resources projects in these valleys. Thus particular approach towards

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[55] See State Irrigation and Drainage Acts, the Interstate River Water Disputes Act, 1956, the River Boards Act, 1956, the Interstate Water Dispute Tribunal Awards, the 73rd and 74th Constitutional Amendment Acts, the Panchayath Extension to Schedule Areas Act, 1996

[56]http://demo.cgg.gov.in/apwater/downloads/acts/River%20Conservancy%20Act(River%20Conservation%20Act%20%20).pdf,accessed on February 12, 2010

[57] The Mines and Minerals (Regulation and Development) Act, 1957, the Kerala Protection of River Banks and Regulation of Removal of Sand Act, 2001 and The Kerala Protection of River Banks and Regulation of Removal of Sand Rules, 2002

[58] Ramakar Jha, K. D. Sharm, and V. P. Singh, "Critical Appraisal of Methods for the Assessment of Environmental Flows and their Application in Two River Systems of India", *KSCE Journal of Civil Engineering* (2008) available at www.springer.com/12205 visited on 12-0-2014

[59] The Damodar Valley Corporation Act, 1948

[60] *Id*. at s.12

The functions of the Corporation shall be-- the promotion and operation of schemes for irrigation water-supply and drainage, the promotion and operation of schemes for the generation transmission and distribution of electrical energy, both hydra-electric and thermal, the promotion and operation of schemes for flood control in the Damodar river and its tributaries and the channel, if any, excavated by the Corporation in connection with the scheme and for the improvement of flow condition in the Hooghly river, the promotion and control of navigation in the Damodar river and its tributaries and channels, if any, the promotion of afforestation and control of soil erosion in the Damodar Valley, and the promotion of public health and the agricultural, industrial, economic and general well-being in the Damodar Valley and its area of operation.

[61] See the River Boards Act,1956

[62] *Id*. at ss.13 and 14

[63]The Brahmaputra Board Act, 1980

different rivers was followed. In Kerala only in 2002 an Act was passed to protect the river basins and beds from the indiscriminate sand mining[64].

TRIBUNAL ORDERS AND STATUTORY ORDERS

The Narmada Control Authority was formed following the order of Narmada Water Disputes Tribunal Award of 1979. Similarly the Cauvery Tribunal and the Second Krishna Tribunal have recommended formation of basin wide authorities. Several basin management-like entities have been created through statutory orders. The Water Quality Assessment Authority of 2002[65] has command wider than a single basin. These powers included ensuring water quality and environment flows in rivers. Various state orders also constituted various authorities[66]. Supreme Court orders is an important instance in this regard. The order of Supreme Court constituted the Central Ground Water Authority[67]. It was constituted in the year 1996, under the Environmental Protection Act, 1986. This authority had mandate wider than a single river basin. This is also an attempt at water management over large area. Along with this Inter-State agreements, Union Government Orders, Organisations Basin level corporate entities set up by the States, Basin authority set up under environment clearance conditions, voluntary corporate bodies, community efforts and lessons from basin management experience are the existing helping hands in developing a comprehensive management of river beds and basins.

LEGISLATIVE MEASURES FOR LAKES CONSERVATION

Plethora of legislations operates for the protection of lakes and allied wetland ecosystems in India. Legislations such as the Water(Prevention and Control of Pollution) Act, 1974 as amended up to 1988, the Environment(Protection) Act, 1986, , the Wildlife(Protection) Act, 1972 and its amendments, the Forest (Conservation) Act, 1980 amended in 1988, the Indian Fisheries Act, 1857, Coastal Regulation Zone Notification, 1991, Municipal Solid Waste (Management and Handling) Rules, 2000, Bio-diversity Act,2002 and the Environment Impact Assessment notified under the National Environmental Policy, 2006 are some prominent ones.

It can be seen that various departments and ministries shares the responsibility of protection and up gradation of lakes in India. Ministry of water resources, MoEF, agriculture ministry and

[64] *Supra n*. 51

[65] *Supra n*.46 Quality assessment of both surface and ground water through integrated management of river basin was stressed in the 2002 policy. This authority was for the implementation of the measures under the 2002 water policy

[66] The Tripartite (Centre, Andhra Pradesh and Karnataka) Tungabhadra Board (with very limited mandate) was constituted by the President of India in exercise of the powers vested under sub section 4, section 66 of the Andhra State Act 1953. The Bhakra Beas Management Board was constituted through an executive order as per the section 79 of the Punjab Reorganisation Act 1966 to regulate supply of the Sutlej, Ravi and Beas and to distribute power from the Bhakra Nangal and Beas projects

fisheries ministry are some of them. Municipal corporations, developmental authorities, tourism departments and water supply boards are main departments which shares responsibility to protect the urban and rural lakes in India.

In 2001 a central government initiative was made through National Lake Conservation Plan to protect the lakes in India. It was an ecosystem based approach. The 12th lake conference held at Jaipur made the *Jaipur Declaration* [68]for protection of lakes and wetlands associated with them. They have adopted a specific strategy for protection of each lake in a holistic manner. MoEF operates at the apex for the protection of lakes. It develops the national level policies and plans for the protection and conservation of urban lakes. In order to remedy the management problem of lakes situated in various states MoEF has directed the states to set up City Level Management Committees. They carry out the river and lake conservation programmes. They act in co-ordination with Centre, state and urban local bodies for carrying out the conservation measures. This mechanism if implanted will bring out holistic development of lakes. But just like any other government initiative its aim is not implemented fruitfully. In order to carry out the programme effectively special purpose vehicles[69] were also constituted under the programme. Along with this number of NGO's[70] also operate in the field of lake conservation.

The *Jaipur Declaration* adopted for the conservation of lakes adopts an integrated approach towards lakes and allied wetland ecosystems. The declaration acknowledged the importance of lake wetlands for domestic, agricultural and recreational uses. It also considered the critical contribution of lakes wetlands in providing host of major ecosystem goods and services. They stressed the wise use of lake wetlands in terms of their values and functions. The conference expressed concern over the rapid deterioration of lakes and wetlands from developmental and anthropogenic pressures.

It is clear that even though lakes are recognized for their services their economic value is not well documented or understood. They recognized the significant role of basins in water bodies. Their quantity and quality are the determining factors of ecological health. They stressed the need for integrated lake basin management. Need for urgent action at national, regional and global level was called to prevent the degradation of lakes and wetlands. They have laid down an action plan calling upon governments to implement them with the help of community. Thus the realisation of

[68] See http://wldb.ilec.or.jp/data/ilec/wlc12/Jaipr-decl.pdf visited on 12-06-2012

[69] Bhoj Wetland Authority for the restoration and management of Bhoj wetlands in Madhya Pradesh, Chilka Development Authority in Orissa for the Chilka Lake, Loktak Development Authority for Loktak lake in Manipur, Lake Development Authority Bangalore (Karnataka) for Bangalore lakes, Jammu and Kashmir Lakes and Waterways Development Authority for Jammu and Kashmir Lakes, Hyderabad Urban Development Authority for Hyderabad Lakes in Andhra Pradesh, East Kolkata Wetlands Management Authority for the conservation and management of a large number of water bodies in district 24 Pargana in West Bengal and Jal Vikas Samiti in Udaipur (Rajasthan)

[70] WWF, UNEP, UNDP, ADB, World bank, local organizations, citizens groups are some of the NGO's operating in this field.

community involvement in conservation of valuable resources will add momentum to the measures taken.

THE KERALA PROTECTION OF RIVER BANKS AND REGULATION OF REMOVAL OF SAND ACT, 2001

The Kerala Protection of River Banks and Regulation of Removal of Sand Act, 2001 tries to protect the river beds and river banks from unnecessary encroachment and removal of sand[71]. Removal of sand affects this resource by changing its biophysical environment. Thus the preamble of the Act reflects the approach of the legislature. It is obviously towards sustainable development. It is stated in the preamble of the Act that the Kerala government had taken note of the indiscriminate and uncontrolled removal of sand from the rivers causing large scale river bank sliding and loss of property. The Government had also taken not of large scale dredging of river sand disturbing the biophysical environment system of the river and hence it was felt expedient in public interest to provide for regulatory measures for the protection of river banks and for removal of sand from rivers. Constitution of Kadavu committee[72] and the powers and functions assigned to them along with other provisions of protection are measures for conservation of the bio physical environment[73] of river ecosystem. These provisions make the Act more attractive. But there is lack of integration between the departments. Regarding the removal of sand, studies[74] is to be conducted for the assessment of sand that can be removed from the particular river from time to time. This is carried out through the sand audit conducted at regular intervals. Even then removal of sand near the river banks and bridges are completely prohibited[75]. This measure is particularly for the protection of river banks. Along with this the obligations cast up on the Kadavu committee makes it clear that bio physical environment of the river can be protected only by adequate protection of river beds and banks[76]. Along with this provisions for river bank development plan and the constitution of river fund makes the Act more suited to the protection of the river banks and beds and its ecology[77].

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[71] *Supra n*.57 preamble
[72] *Supra n*.57 in s.3
[73] *Id* at s. 12
[74] *Id* at s.29
[75]*Id* at s.12 (4) and (5)

[76] *Id*. at s.15 of the Act regarding the obligation of Kadavu Committee: Every Local Authority in the Slate having Kadavu or river bank for sand removal shall maintain such Kadavu or river bank in a safe condition and protect its bio-physical environment system by taking effective steps to control river bank sliding. Every local authority shall erect concrete pillars at the Kadavu or river bank in such a way that no vehicle shall have direct access to the bank of the river The local authority shall establish a check post at each Kadavu or river bank and maintain proper account of the sand removed from the Kadavu. Bamboo and "Attuvanchi" may be planted on the river bank with the help of Forest Department to control river bank sliding.

[77] *Id* at.ss.16 and 17

Stringent penalties[78] prescribed under the act for the violation of the act makes it more deterrent towards the violators and attractive to the conservationists. Thus, the act clubs within it the twin needs of development and environment beautifully. But what is necessary is the proper implementation. Even after this enactment the encroachment for plundering the wealth of river continued unabatedly sometimes with the help of officials[79]. The sand mafia acquired great momentum and they were not hesitant to take up the life of anyone who would come in their way[80]. Thus, the act could not be implemented for many years in the holistic sense. But later on, it could be seen that the involvement of the public in this matter has changed the situation[81]. Now the stringent prohibitions regarding sand removal have become the order of the day[82]. The construction industry is in search of other alternatives for the sand.

ROLE OF THE JUDICIARY IN THE PROTECTION OF INLAND WETLANDS

Application of Environmental Jurisprudence for Conservation of Inland Wetlands

Indian law courts have been positive on the issue of protection of inland wetlands. Some remarkable principles and doctrines propounded by the Indian judiciary for the protection of the wholesomeness of the environment[83] are helpful in the conservation of inland wetlands from various threats faced by them.

i) *Doctrine of Absolute Liability*

The doctrine of absolute liability can be an available mechanism to make an enterprise that is occupied with an inherently dangerous or hazardous activity and harm results to anybody by virtue of a mishap in the operation of such dangerous or naturally unsafe movement coming about. This can include the poisonous polluting materials or hazardous wastes let into the inland wetlands without treating them properly. The industry or body is strictly and completely obliged to repay every one of the individuals who are influenced and the damage to the environment and such risk is not subject to any exemptions. This is the trendsetter from Supreme Court[84].

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[78] *Id* at ss.22-25

[79] K.S.Sudhi, "River Sand Mining may be Resumed for Six Months", The Hindu, Kochi(24th March 2014)

[80] Anupam Chakrabarty, "Sand Mining Lobby Uses Tricks to Evade MoEF Scrutiny", Down to Earth (13th August, 2013)

[81] M. Suchitra, Mother of Three Wages Lone Battle Against Sand Mining Lobby, Down to Earth(7th August, 2013)

[82] Anupam Chakrabarty, "No sand mining without environmental clearance NGT", Down to Earth (5th August, 2013). See also Hindu Business Line, Centre Asks State to furnish details of Illegal Sand Mining, Press Trust of India , (24th November 2013)

[83] See for further reference chapter 3 *supra* p.13 foot notes 55-58

[84] *Union Carbide Corporation* v. *Union Of India* A.I.R. 1992 S.C. 248

ii) Polluter Pays Principle

Polluter pays principle[85] does not adhere only to finding fault instead it supports a remedial methodology which is concerned with repairing natural harm. It is a rule in international environmental law where the polluting party pays for the harm or damage done to the natural environment.

iii) Precautionary Principle

Precautionary principle[86] applied by judiciary developed three basic concepts. They are, environmental measures must anticipate, prevent and attack the causes of environmental degradation. Lack of scientific certainty should not be used as a reason for postponing measures. Onus of proof is on the actor to show that his action is benign.

iv) Doctrine of Public Trust

The public trust doctrine is another development for the protection of natural resources[87]. It rests on the principle that certain resources like air, water, sea, and the forests have such great importance to people as a whole that it would be unjustified to make them a subject of private ownership[88].

v) Principle of Sustainable Development

Finally, the doctrine of sustainable development highlights the concept of sustained development. It tries to strike a balanced approach towards resource use. In Rural *Litigation and Entitlement Kendra* v. *State of UP*[89], the court for the first time dealt with the issue relating to the environment and development; and held that, it is always to be remembered that resources are the permanent assets of mankind and are not intended to be exhausted in one generation. In *Vellore Citizen's Welfare Forum*[90], the Supreme Court observed that sustainable development has come to be accepted as a viable concept to improve the quality of human life while living within the carrying capacity of the supporting eco-system.

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[85] *Vellore Citizen's Welfare Forum v. Union of India,* A.I.R. 1990 S.C. 273
[86] *Ibid.*
[87] See chapter 4 *supra* p. 17
[88] *M.C.Mehta* v. *Kamal Nath*, (1997)1 S.C.C. 388 Supreme Court made the observation that public at large is the beneficiary of the seashore, running waters, airs, forests and ecologically fragile lands. The state as a trustee is under a legal duty to protect the natural resources. These resources are meant for public use and cannot be converted into private ownership. Every generation owes a duty to all succeeding generations to develop and conserve the natural resources of the nation in the best possible way. It is in the interest of mankind. It bis in the interest of nation. Thus public trust doctrine is a part of the law of land.
[89] A.I.R. 1985 S.C. 652
[90] A.I.R. 1996 S.C.2718

All the above-mentioned measures are the creation of a judiciary, particularly for the protection of the environment and various ecosystems. The water right was incorporated as a fundamental right through judicial decisions. In *Narmada Bachao Andolan v. Union of India*[91], the Supreme Court of India upheld that

> "Water is the basic need for the survival of human beings and is part of the right to life and human rights as enshrined in Article 21 of the Constitution of India … and the right to a healthy environment and to sustainable development are fundamental human rights implicit in the right to life".

BALANCING OF CONCEPTS OF ENVIRONMENT AND DEVELOPMENT

In several decisions rendered by the Supreme Court and High Court, honorable courts have observed the need for a balanced approach emphasizing sustainable development. In *M.C. Mehta* v. *Union of India*[92] Supreme Court dealt with groundwater depletion. On 20-3-1996 honourable court took notice of the news item under the caption "Falling Groundwater Level Threatens City," appearing in the Indian Express of 18-3-1996. This court issued notice to the Central Groundwater Board and the Delhi Pollution Control Committee. The news item was brought to the notice of this court by Mr. M.C. Mehta, Advocate. Under this court issued notice to the Municipal Corporation of Delhi and the Delhi Waterworks and Sewerage Disposal Undertaking. On 5-12-1996 the Honourable Court issued the order. While dealing the case court incidentally dealt with the need for a "hological" approach to water resource management. Court said that

> "Sustainable solutions to water-resource and land-use problems should be achieved through appropriate interventions, and supply and demand management options. Regulation on exploitation through legislation and effective administration with a focus on water conservation, recycling or reuse, and restrictions to ensure equitability in water availability and pragmatic land use. Management of water resources to achieve the overall inspirational goal of sustainable development warrants legal interventions based on the principle of inter and intra-generational equity, the precautionary principle, conservation of natural resources and environmental protection".

There is thus adequate reason to take recourse to Sections 3, 4, and 5 of the Environment (Protection) Act, 1986 for implementing ecological approach to water resources management.

> "In order to address the complex issues in water resource management it is prudent that the Central Government considers constituting an authority under the Environmental

[91] Vrinda Narain, Water as A Fundamental Right : A Perspective from India, 34 *Vermont Law Review* (2012), p.921
[92]H:/micah.lebank/India Writ Petitions/MC Mehta Groundwater case. Docu. visited on 16-07-2015

> (Protection) Act, 1986 and confers on this authority all the powers necessary to deal with the situation created by the depletion of groundwater levels, dwindling surface water resources, deterioration of surface and groundwater quality and haphazard land use. The authority should be headed by a retired scientist with the expertise in the field of hydrology, hydrogeology and information technology".

Recommendations to be adopted for this purpose as set out by court[93],

> "A Central Groundwater Resource Management Authority, with the composition as delineated .....with mandate for coordination and implementation of all activities of planning, development, allocation, implementation, research and monitoring of all water resources need to be established to promote intra and inter-generational equity, as also to operationalise the precautionary principle in sustainable water resource management".

All the States need to constitute similar authorities with functions in the State as of the Central Authority. As per the direction of SC the mandate of the authority needs to include the following:

> "Land use of river basins should act as the basis for regional planning for sustainable water resource management. To equip the nation for an integrated land use practises medium and long-term national use plans should take care of agricultural practices, human settlement patterns and industrial topology. It must be done in consultation with ministries and departments concerned based on the regional water supportive capacity. The present cropping pattern is to be assessed to lay down the National Agricultural Water Use Policy to encourage the judicial use of water resources. A review of groundwater levels and quality levels is a necessary thing. The entire river basin needs to be protected to ensure the maintenance of minimum flows in the rivers so as to fulfil the riparian rights to protect the flood plains, as well as protect the vital ecological functions of the rivers. Techno-economic feasibility of programs on the reuse of appropriately treated sewage for agriculture, reuse of industrial wastewater as industrial process water, use of treated sewage in social forestry and public parks in municipal areas, and reuse of treated wastewater in new housing complexes for non-consumptive usages is also necessary for the river basin protection. This will protect, conserve, and augment natural and manmade wetlands in the country. Catchment area treatment, including construction of check dams, contour bundling, control of river bank erosion, and plantation of endemic fast-growing tree species to arrest soil and water loss in all river basins is to be ensured. All these can be achieved through ensured community participation to connect traditional knowledge at all stages in the ecological approach to water resource management."

[93] *Supra n.* 67

In another *M.C. Mehta* case[94] the Apex Court further considered the need to have the environment protection and fundamental duty cast upon the State by virtue of Article 51 A(g) and other relevant provisions of the Constitution of India. Highlighting the 'polluter pays principle', it was held that the natural resources of air, water and soil cannot be utilised if the utilisation results in irreversible damage to the environment and that life, public health and ecology have priority over unemployment and loss of revenue. The principle of 'sustainable development' and the 'precautionary principle' were reiterated and explained, making it clear that development and protection of the environment are not enemies and that a balance has to be struck; however, categorically asserting that in case of doubt, environment concerns take precedence over economic interest.

Similar observations made by courts on land use under the water bodies can be seen *Association of Environment Protection* V. *State of Kerala*[95] and *Paristhithi Samrakshana Samithi* V. *State Of Kerala*[96] .

In *M.C.Mehta* v. *Union of India and others*[97], Supreme Court had occasion to go into the issue of sustainable development and its impact on environmental problems. In paragraph 48 of the judgment of the Supreme Court has held as follows:-

> "The development and the protection of environments are not enemies. If without degrading the environment or minimizing adverse effects thereupon by applying stringent safeguards, it is possible to carry on development activity applying the principles of sustainable development, in that eventuality, the development has to go on because on cannot lose sight of the need for development of industries, irrigation resources and power projects etc. including the need to improve employment opportunities and the generation of revenue. A balance has to be struck. We may note that to stall fast the depletion of forest, series of orders have been passed by this Court in T.N. Godavarman's case regulating the felling of trees in all the forests in the country. Principle 15 of Rio Conference of 1992 relating to the applicability of precautionary principle which stipulates that where there are

[94] (2004) 12 S.C.C. 118,

[95] 2002 (1) K.L.T. Honourable Supreme Court discussed the Public Trust Doctrine its theoretical and philosophical background and the Judgement of *M.C. Mehta* v. *Kamal Nath*. Various other judgments such as *Illinois Central Railroad Co*. v. *People of the State of Illinois*, 146 US 387; *Gould* v. *Greylock Reservation Commission*,350 Mass 410 (1966); *Sacco* v. *Development of Public Works*, 532 Mass 670*; Robbins* v. *Dept.. of Public Works* 244 NE 2d 577 and *National Audubon Society* v. *Superior Court of Alpine County* 33 Cal 3d 419 court observed that "The State is the trustee of all natural resources which are by nature meant for public use and enjoyment. Public at large is the beneficiary of the sea-shore, running waters, airs, forests and ecologically fragile lands. The State as a trustee is under a legal duty to protect the natural resources. These resources meant for public use cannot be converted into private ownership".

[96] Indian Kanoon - http://indiankanoon.org/doc/1641803/ visited on 4-09-2014

[97] A.I.R. 2004 S.C. 4016

> threats of serious or irreversible damage, lack of full scientific certainly shall not be used as a reason for proposing effective measures to prevent environmental degradation is also required to be kept in view. In such matters, many a times, the option to be adopted is not very easy or in a straight jacket. If an activity is allowed to go ahead, there may be irreparable damage to the environment and if it is stopped, there may be irreparable damage to economic interest. In case of doubt, however, protection of environment would have precedence over the economic interest. Precautionary principle requires anticipatory action to be taken to prevent harm. The harm can be prevented even on a reasonable suspicion. It is not always necessary that there should be direct evidence of harm to the environment".

This is the complete answer to the issue regarding the land use of river beds and river basins. In a conflicting situation of irreparable injury to the environment and severe damage to the economic interest, protection of environment would have precedence over the economic interest. And, towards such protection, anticipatory action on precautionary principles is also necessary and it is the duty of the State to take such action direct the expert committee headed by the District Collector to ensure that there is no sand mining within the prohibited distance of bridges, river banks, bathing ghats, and irrigation projects. Steps should also be taken to see that the river basin is protected. The mining could only be permitted without affecting the river basin.

JUDICIARY ON THREATS TO INLAND WETLANDS

Both SC and HC in many occasions addressed the threats faced by the inland wetlands in various case laws. They have come down up on the polluters and bodies causing threats severally. They have also applied the environmental principles and doctrines to remedy the situation.

i) Measures Taken to Combat Pollution of Inland Wetlands

Water pollution has always been the serious concern of the Supreme Court in many cases. In *M.C. Mehta* v. *Union of India* [98] the S.C. dealt with pollution of Ganga river basin. It was mainly due to the negligence of tanneries located near to it. They were reluctant in establishing the Primary Treatment Plants for treatment of effluents. After the consideration of issue court directed the tanneries to set up the primary treatment plants and get it approved form the State pollution control boards. Principle of sustainable development was applied while deciding the case. Thus court tried to protect the cradles of civilization and biological security of the river Ganga. Empowerment of authorities to take steps to control pollution could be observed in another *M.C. Mehta* case[99] . It was a follow up action in the earlier Ganga pollution case. Here the municipalities and pollution control boards were empowered to take immediate action against the polluter of water bodies. In

[98] A.I.R. 1998 S.C. 1037
[99] A.I.R.1988 S.C, 1115

F.K. Hussain v. *Union of India*[100], dispute arose regarding the administrative scheme evolved by the authorities to augment the water supply by digging wells and drawing water from those existing wells to meet increasing needs. Petitioner objected to the scheme on the ground that if implemented it would lead to the salinity of freshwater aquifers and it would lead to the collapse of the existing water supply also. The court found that many suggestions from the authorities were not satisfactory and asked them to wait until they got the nod from the central government.

In *Ajay Construction v. Kakateeya Nagar Co-op Housing Society Ltd*[101]. Ajay constructions made its multi-storeyed open flats illegally obtained permission to construct the sewage of its building connecting to the drainage pipeline laid down by the respondent society. This led to uncontrolled sewage flow to the premises of Osmania University causing tremendous water pollution[102]. The court pointed out the "absolute liability"[103] on the part of those who are engaged in construction work, particularly of the multi-storeyed structures, not to commit nuisance by letting out effluent from their drainage system.

In *M.C. Mehta* v. *State of Orissa*[104], *the* court considered the unsanitary conditions created to the Taladanda canal due to untreated wastewater from the hospital and other parts of the city. This area is expected to remain dry throughout the year except in the rainy season. But it is full throughout the year. Sewage from various parts of the city gets into it and consequently into the river. This creates health problems in cities. The court while deciding the case discussed the inactive mode of operation undertaken by the authorities concerned. The court directed the authorities to take proper action to restore the wholesomeness of water which is supplied for human consumption.

Court had come down heavily up on the activities of authorities responsible for the protection of natural resources when they are wrong. More over court has keenly applied the public trust doctrine which has become part of law of land**.** In *Nature lovers Movement* v. *State of Kerala*[105], the High Court of Kerala reiterated the principle evolved in *M.C. Mehata* v. *Kamalanath.*

> *"*Our legal system involves the Public Trust Doctrine as part of its jurisprudence. The State is the trustee of all natural resources. They are by nature meant for public use and enjoyment. Public at large is the beneficiary of the seashore, running water, air, forest and ecologically fragile lands. The State as a trustee is under a legal duty to protect the natural

[100] A.I.R. 1990 Ker. 320
[101] A.I.R. 1991 A.P.294
[102] P.Leelakrishnan, *Environmental Law Case Book*, LexisNexis, Butterworths, Delhi(2004), pp.45-50.
[103] *Supra. n.*73
[104] A.I.R. 1992 Ori. 225
[105]http://indiankanoon.org/search/?formInput=nature%20lovers%20movement%20vs%20state%20of%20kerala visited on 20-11-2012

> resources. These resources meant for public use cannot be converted into private ownership. Thus, the Public Trust Doctrine is now part of the law of the land".

In the instant case, the Kerala State Government granting approval and consequent proceedings for issue of Pattayams in favour of occupants of forest was challenged on the ground that there was environment degradation in de-reserving forest land or using it for non-forest purposes by occupants affecting environmental equilibrium held that each occupier who prays for regularization on the basis of compensatory afforestation scheme and consequent issue of title deed in his favour shall pay reasonable of compensation to state for injury caused by him to general public. This was based on the polluters pay principle evolved in the Supreme Court in *Vellore Citizens' Welfare Forum's* case observed that 'the polluter pays principle' and 'the precautionary principle' are essential features of 'sustainable development'. In *Indian Council for Enviro-legal Action* case, the Apex Court adopted 'the polluter pays principle' as a sound principle to be reckoned with and followed by all agencies, governmental or otherwise as well as the persons or institutions responsible for environmental pollution[106].

In 1995, in response to a PIL, by a New Delhi–based nongovernmental organization (NGO) now known as *the Research Foundation for Science, Technology, and Ecology*, the Supreme Court asked relevant agencies for information on the amount of hazardous waste imported and generated domestically, as well as how it was being disposed of. But the state pollution control boards were not collecting data properly, for two years and the MoEF and the Central Pollution Control Board had no authentic data to provide. So the court convened a panel to investigate and make recommendations known as the High Powered Committee on Management of Hazardous Wastes (HPC). This panel submitted its final report in 2001. Pursuant to this Supreme Court passed the judgement in 2003. A committee was appointed by court to assess the creation and disposal of hazardous wastes by industries and other means of import of waste in the country. The monitoring committee found the clear violation of rules by many industries like Thiruvanathpuram Travancore Titanium Products. The industry was asked to be closed. But upon the writ petition made by the company Kerala HC interfered and granted an interim stay up to 2006. This committee approached the SC for strong directions and the court allowed it. Through this order, HC or any other authorities were prohibited from interfering in the working of the monitoring committee. The same was the case with Hema, Golden Chemicals, and Tami Nadu Chromates. Pollution caused by Hema was analysed as "deliberate poisoning of communities with toxic wastes, contaminating water, soil, and air." They were asked to pay a fine of 3.9 US dollars. Thus the committee still works with more vigour to eradicate the pollution and consequent eutrophication of many water bodies. This a welcoming attempt from the judiciary when the responsible authorities are inactive in their function.

[106] http://shodhganga.inflibnet.ac.in/bitstream/10603/8107/13/13_chapter%208.pdf visited on 20-10-2014

ii) Measures to Address the Illegal Mining of Inland Wetlands

Illegal mining and removal of earth and sand from the inland wetlands and allied regions are another threat to these wetlands. The Green Tribunal, SC and HC are very vigilant to protect the water bodies. But most of the time their orders are disobeyed and not complied properly. Awareness and participation of people is necessary to change the situation. In *Soman* v. *Geologist*[107] , the petitioners challenged two conditions imposed by the Geologist, while granting the quarrying permits to them for quarrying ordinary sand and brick clay from their properties. Quarrying permits were issued with 18 conditions, subject to which the minor mineral could be mined from their property. The petitioners were aggrieved by two condition in those permits .those restrictions were that no quarrying shall be done within 75 meters of railway line and 50 meters of public road, water course, residential building, boundary wall of place of worship, burial grounds or burning ghats, except under and in accordance with the previous permission of the State Government or the competent authority". "No dewatering the mine pit using pump is permissible and mining has to be ceased once this becomes necessary and mining should be done manually".

The honourable high court of Kerala observed that any developmental activity without considering the rights of future generations is not a sustainable use of the land. Naturally, the resources cannot be extracted at a rate faster than the nature's capacity to regenerate them and it is absolutely necessary that the basic qualities of the land have to be maintained for the succeeding generations.

The National Green Tribunal through its order prohibited the sand mining from river beds across the country without environmental clearance[108]. It was based on a petition submitted before the tribunal by the bar association[109] alleging the illegal sand mining that takes place in the river beds of Ganga, Yamuna and Hindol without getting prior Environmental Clearance. They alleged that it affects the integrity of the river basins and the entire ecology is tilted. Supreme Court[110] added to this order that any person carrying out sand miming which is less than five hectares requires clearance from the Ministry of Environment and Forests or the State Environment Impact Assessment Authority (SEIAA). In *Himmat Singh Shekhawat* v. *State of Rajasthan*[111], regarding

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[107] 2004 (3) K.L.T. 577, see also P Nandakumaran, T. S. Anitha Shyam, Mini Chandran *et. al.* "Impact of River Sand Mining on the Groundwater Regime in Kerala–An Overview", Central Ground Water Board, Kerala Region, Thiruvanathpuram, Kerala.

[108] The National Green Tribunal on Aug 5th 2013 restrained sand mining without any license or environmental clearance from river beds across the country on a plea alleging that such activities were going on in UP with the "willful connivance" of its state machinery.

[109] *National Green Tribunal Bar Association* v. *Ministry of Environment and Forests (No. 171 of 2013)*

[110] *Deepak Kumar* v. *State of Haryana* (2012) 4 SCC 629 court ordered that sand mining on either side of the rivers, upstream and in-stream, is one of the causes for environmental degradation and also a threat to the biodiversity. It had also ordered that mining activity even in less than 5 ha is to obtain Environment Clearance for MoEF /SEIAA.

[111]See for the complete judgment http://www.indiaenvironmentportal.org.in/files/sand%20mining%20Yamuna%20NGT%2013%20Jan%202015.pdf visited on 10-01-2015

rampant illegal sand mining in the Yamuna riverbed going on in violation of law, without taking prior Environmental Clearance. Court considered all aspects of the problem and gave number of directions. It directed the Ministry of Environment and Forest to formulate a uniform cluster policy in consultation with the States for permitting minor mineral mining activity including, its regulatory regime, in accordance with law

iii) Unplanned Tourist Activities and Cultural Misuse

Unplanned Tourist activities without monitoring and compliance with the environmental legislations always create problems. It mainly affects the inland water bodies as they are the attractions for the tourists**.** In *EIH Ltd.* V. *State of Rajasthan*[112] the dispute was whether a hotel could be allowed to be constructed in no-construction zone near Udaipur Lake. The zone was declared to be no construction zone as per the notification in 1997. But the permission for construction was granted prior to the notification. Considering the total situation court justified the construction. It was based on the principle of sustainable development. The condition of some important tourist area lakes such as Dal Lake of Kashmir is one of the important concerns of the judiciary. The lake was originally occupied 18 Km in the area. Later on, it was shrunk to 15Km. due to encroachment on tourist activities. Moreover, the wastes generated were deposited into the lake without any treatment and this supports the growth of weeds and contaminates the whole area of the lake. J.K. High Court prohibited the use of polythene in these areas. The court also directed the officials to take steps against the violators and report the actions taken by them

i) Illegal Constructions Role of Judiciary

Land Reclamation and Construction is another threat faced by inland wetlands. Judiciary has considered this problem in many occasions and given proper directions for the same.

A PIL was filed by Balwant Singh Mehta in 1982 to save the lakes of Udaipur. High Court of Rajasthan ordered the administration of Udaipur to constitute a committee that can develop a viable plan to protect the city's lakes. The administration was also asked to provide potable water to all citizens. But these orders were disregarded by the authorities.

Jheel Sanrakshan Samithi, a Udaipur-based NGO filed a PIL in SC against Rajasthan government. They sought urgent judicial intervention to clear up the lakes of Udaipur, to check the flow of pollutants into these bodies. They also sought intervention to protect the land area from illegal encroachment and construction. SC passed the case to Rajasthan HC for consideration. In addition to this two more PILs were filed to expedite the proceedings in the court. Thus the court passed its final verdict in 2007. The court directed the government to establish Lake Development authority,

[112] A.I.R.2001 Raj.236

no construction zone, defiltration of lake regularly, and prohibition of conversion and construction around the lake and the catchment areas. Authority was also directed to specify the catchment areas of lakes.

In *M.C.Mehta* v. *Union of India*[113], Supreme Court recognised the need to control construction near two (Badhkal and Surajkund) lakes. Court emphasised the role of municipalities and development authorities in the protection of the water bodies which are the precious gifts of nature.

In 2008 environment support group approached Karnataka HC with a PIL[114]. The requirement was needed for a commitment from private leaseholders to maintain the status quo of lakes privatisation programme[115]. HC upheld the privatisation of lakes in Bangalore but subjected it to various conditions[116]. PIL also addressed the larger issue of bringing together all departments involved in lake protection and management. The task was to formulate a scheme to protect lakes for the future and water security for the urban population. Justice Patil's committee was appointed to study the matter. HC accepted the ecologically wise and socially sensitive guidelines proposed in the report of the committee. Thus, the Court directed the state to take immediate action to protect Bangalore lakes.

But storm water run-off, waste from religious activities, dhobi ghats, idol immersions, animal waste, and washing of vehicles are polluting many water bodies across the country. Along with this is an increasing quantity of chemical fertilizers and pesticides being washed into the river because of agricultural activity taking place on the banks. The toxic chemicals from surface run-offs could be from farmlands, nurseries, orchards, construction sites, gardens, lawns, and landfills. All the above attempts show certain positive signs of improvements towards the conservation of wetlands. People should also be aware of the need for protection of these fresh water bodies which are the creation of nature.

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[113] 1997(3) S.C.C. 715

[114] The Hindu, HC Admits Petition on Privatisation of Lakes, Bengaluru edn., Karnataka, (November 13, 2007)

[115] Times of India, High Court Sets Guidelines on Lake Privatization, Bengaluru edn. Karnataka (Apr 12, 2012)

[116] The High Court has observed that issuing directions were necessary for the preservation of lakes. The court added that it was necessary to undertake a survey of lakes and tanks, demarcate boundaries and fence such water bodies. It ordered that all unauthorised construction within 30 metres from the periphery of the lakes and tanks should be cleared. "Removal of silt and scientific de-weeding has to be conducted periodically in addition to stopping the flow of sewage into lakes and tanks in the buffer areas of such bodies," ordered the court. It constituted local- and district-level committees across the state in order to improve lakes. With regard to Bangalore, the court constituted a committee and directed them to hold bi-monthly meeting and collect reports regarding management and maintenance of lakes, including the four lakes that have been leased out. The committees must send their reports to LDA, which shall initiate measures for preservation and maintenance of lakes.

CONCLUSION

Each inland wetland ecosystem from its head to its mouth is an integrated system. It must be treated holistically. India's river basins have severely degraded quantitatively and qualitatively. The inland wetland water bodies have become extremely polluted due to various reasons. Village areas almost rely on groundwater for drinking and irrigation. Now groundwater contamination is widespread. An alternative source of safe drinking water is a challenge for the whole community. Rainwater harvesting and river interlinking programs are treated as the best available solution. The National Water Policy, of 2012 demands a nationwide information system. Therefore, it caters to the planned development and management of river basins. Water uses are to be allocated on a priority basis. Groundwater harvesting is to be minimized and due regard is to be given to the maintenance of quality. To protect these inland wetlands integrated management strategies are to be designed.

The success of integrated water management strategies depends on striking a balance between human resource use and ecosystem protection. Watershed-based planning and resource management is a strategy for more effective protection and restoration of aquatic ecosystems. This approach emphasizes all aspects of water quality. It includes chemical water quality, and physical water quality such as temperature, flow, and circulation. It includes habitat quality as stream channel morphology, substrate composition and riparian zone characteristics. Biological health and biodiversity are also part of this watershed-based approach[117].

To deal with non-point source pollution comprehensive scale of analysis and management is required. Non-point source strategies recognize that small sources of pollution are widely dispersed on the landscape and their cumulative impact on water quality and habitat is great. A whole basin approach to protect water quality has proved most effective. This includes addressing the issue of water quantity, protection of riparian areas, control of aquatic non-native species, protection of water quality, protecting the integrity of permanent and intermittent seeps, streams, rivers, wetlands, and riparian areas and conducting comprehensive all seasonal water quality monitoring. Watershed restoration should be an integral part of the conservation program. Most important measures among them would be control and prevention of pollution and sediment production, restoration of the condition of riparian vegetation and restoration of in stream habitat complexity. But in all environmental management activities the importance of community perspectives and values should not be overlooked. Public support, co-ordination with people and organizations will ensure long term protection of these precious areas. Along with this equitable access to these resources through transparent management and improved policy, regulatory and institutional frameworks will help in sustainable inland wetland management.

[117] N. Ahalya and T.V. Ramachandra, "Aquatic Ecosystem Conservation via Watershed Approaches", 4 Environment Research Foundation Newsletter, Karnataka (2002)