

## **WETLAND CONSERVATION IN MAHARASHTRA: NEED, THREATS, AND POTENTIAL**

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Since long wetlands have been considered as the life support systems for millions. However, today in the process of development the wetland resources, particularly fresh water, have been altered and exploited as never before. Despite spending huge amounts on construction of large number of dams and medium irrigation (MI) tanks, Maharashtra is now finding increasingly difficult to cope up with the growing water demand for irrigation, industry and even drinking purpose. At the same time the state, though bestowed with rich natural and manmade fresh water resource and biodiversity therein, finds difficult to conserve them due to increased pollution in most wetlands. The paper discusses the present scenario of freshwater wetlands in the state with need for their environmental protection for the present and future. Paper deals with threats to these water resources and suggests their potential at national and international level to protect and conserve the vital resource for sustainable development of the people and their co existence with nature.

**Keywords:** Wetlands, Maharashtra, conservation potential

### **Introduction**

The state of Maharashtra is blessed with a large number of coastal and inland wetlands. These areas such as backwaters, rivers, lakes, reservoirs, which are permanently saturated with surface or ground water, play an important role in the state's ecosystem and natural resource wealth. The wetlands support a variety of coastal and inland aquatic plant and animal life along with the littoral and riparian biodiversity. The wetlands are credited with several benefits to the local environment such as influencing the local hydrological cycle, climatic regime, water purification, flood control, and giving stability to the shoreline. Besides, these crucial natural resources support rich and diverse food chains for the hundreds of species of animals including birds, both local and migratory, from within and outside India. Fishing in these wetlands is the main livelihood for millions of traditional fishermen communities.

Wetland area in the 35 districts of Maharashtra state is estimated to be 1014522 ha as compared to the total geographic area of 307748 sq km which accounts to 3.30% of the total geographical area of the state. The district with largest wetlands area is Mumbai suburban (24.87%) and Mumbai Urban (11.06%) of their total area due to the coastal wetlands. Pune district has the largest inland wetlands (6.72%) in the state, mainly because of the number of large dams in the Western Ghats part of the district. The wetlands in general are identified in the major types as Coastal Wetlands; classified as mangroves/creeks, intertidal mud flats/beaches/shores and salt pans/fish farms, and Inland Wetlands i.e. rivers/streams, tanks/ponds and reservoirs/barrages. (NWA: Maharashtra, 2010). Maharashtra has the largest number of manmade

wetlands in the country with around 1821 large and medium dams.

In the last few decades it is increasingly realized that there is exponential increase in the environmental problems in the state, just as in the whole country. The Maharashtra being a leading industrialised and urbanised state in India, the gravity and extent of these problems has become more severe. This degradation in ecology is correlated to depletion in the basic natural resources in quality as well as in quantity. Fresh water, a basic life supporting system, is one of the main natural resources and is on decline. In the recent years this situation is further aggravated by the impacts of climate change as a result of global warming. Depletion and degradation in the natural and manmade water resources directly influences life in mosaic of ecosystems and habitats, natural cycles and ultimately the biodiversity, including man. There is general agreement among scientists, technocrats, planners, and now political leaders that water shortage in the state is serious challenge faced by millions, particularly underprivileged.

Maharashtra, despite its position in the country as a largely water sufficient state, is increasingly witnessing serious water shortages, as never before, in the past decades. This affects agriculture, trade and commerce and industrial growth leading to retarded socio-economic development of the society in general. Therefore water conservation and its management has become a priority area for the state government.

It is well known that Wetlands are among the world's most productive environments. They provide

tremendous economic benefits to mankind through fishery production, the maintenance of water table for agriculture, water storage, and the reduction of natural hazards like floods and draughts. Wetlands also contribute to shoreline stabilization, waste disposal, and water purification, and are very popular recreational sites. In addition they have great value from an aesthetic point of view and as landscape. However, today over emphasis is given to maximisation in the use of freshwater wetlands i.e. rivers, reservoirs and minor irrigation tanks (MI Tanks) as a sole purpose of dedicated water supply for agriculture, industry and city water supply. This has seriously undermined its other more important and long term ecological functions and values of natural water resources.

What is grossly ignored today is that wetlands provide critical habitats for many species of fauna and flora. Countless mammal, bird, reptile, amphibian, fish and invertebrate species, quite often threatened with extinction, depend on these habitats for their survival. Their value is further evidenced by the fact that wetlands can produce up to eight times as much plant matter as wheat fields. (Ramsar, 1971). This productivity depends on proper ecological functioning of wetlands. However, these wetlands, particularly natural and old manmade, are among the most threatened habitats today due mainly to drainage, land reclamation, pollution, and over exploitation of wetland species.

Under the Ramsar Convention Bureau (1971) the wetlands of International importance are identified based on the nine criteria, important being population of migratory birds. The six important wetlands in Maharashtra being proposed under Ramsar are identified on these criteria (Ramsar 1971, 1996) of migratory bird population, however, size and economic importance of the wetlands was also considered. The other parameters like hydrology, biodiversity and socioeconomic value is accounted for in prioritizing the wetlands for conservation. These six wetlands include Lonar natural lake, Nathsagar reservoir, Yeldari reservoir, Nandur Madhmeshwar Tank, Navegaon notified wetland and Ujani reservoir. Buffer area of 5 km from the boundary of these wetlands is also identified for detail study and management purpose. Lonar Lake, is 115 ha, is the only natural crater in basaltic rock formed by the meteoritic impact in India, ranking 3<sup>rd</sup> largest in the world. The salt water lake has circular out line diameter of 1,830 m and depth of 150m with steep vertical slope. Rest of the wetlands are manmade reservoirs.

#### Values of wetlands

There is a clear cut split between those who consider ecological importance to wetlands and those who primarily value water resource only as an instrument of economic growth. May it be cash crop agriculture

expansion, urban sprawl, industry or projects like thermal power plants. This has great use of water resource when considered only as a raw material, where the logic of ecology or biodiversity hardly matters. In this scenario where it comes to development at any cost or all costs, it becomes secondary to talk about nature conservation or future generations. Even some leading technocrats and engineers believe in the idea of 'Every rain drop must be used'. Therefore in the process of over utilization or exploitation of all water resources, ecological damage is inevitable. This approach in the last couple of decades has created a situation resulting into qualitative and quantitative degradation of all the wetlands in the state. As a consequence all the major rivers in the state like Godavari, Bhima, Krishna and their tributaries are heavily polluted.

Man made reservoirs and tanks, baring few in the remote upper catchments, are also at various stages of degradation, eutrophication and pollution. The decline in the local fish resource in diversity, density and distribution is a good indication of the negative impact of changed landuse in the watershed, upper catchment and pollution from agriculture, cities and industries. There are several growing number of cases, all across the state in the last few years, of mass fish mortality, eutrophication, spread of exotic weeds, epidemics like jaundice, dengue etc. taking a toll of human life along the rivers and cities such as Ichalkaranjee, Kolhapur. Decline in fish diversity and density in the major tributaries of river Krishna, i.e. river Panchganga and River Warna is an indicator of loss of wetland quality have been well documented in studies by Pawar (1988), Mohite and Samant (2011) respectively.

#### Methodology:

The paper is based on secondary data and ongoing work on wetlands. A major project to identify and map all wetlands in India was launched last decade by the Ministry of Environment and Forests in collaboration with the Indian Space Research Organisation's (ISRO) and Space Applications Centre, (SAC) Ahmadabad. In Maharashtra it was done with Remote Sensing Applications Centre, (MRSAC) Nagpur, as a part of the project on National Wetland Inventory and Assessment (NWIA) programme, which has been referred for the basic data on wetlands in Maharashtra.

#### Results:

Profile of the wetlands in the state of Maharashtra i.e. natural freshwater wetlands like lakes, rivers, water logged areas, and the manmade wetlands such as reservoirs, tanks, and waterlogged areas are given in table 1. The coastal wetlands in the state are given in the Table 2, which includes natural wetlands like creeks, sand beach,

intertidal mud flats salt marshes and mangroves and some manmade wetlands like salt pens and aquaculture ponds.

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**1. Inland Wetlands in Maharashtra**

Sr No.	Category	Number of wetlands	Total wetland Area ha	% of wetland area	Open water monsoon Area ha	Pre-monsoon area ha	% change in area ha
<b>Natural wetlands</b>							
1	Lakes	39	9003	0.89	8760	5961	31.95
2	Ox-bow lakes	2	15	0.00	15	12	20.00
3	Riverine wetlands	1	2	0.00	2	-	100.00
4	Waterlogged	35	284	0.03	219	76	65.29
5	River/stream	3501	299730	29.54	217593	47856	78.00
	<b>Total</b>	<b>3578</b>	<b>309034</b>	<b>30.46</b>	<b>226589</b>	<b>53905</b>	<b>76.21</b>
<b>Manmade wetlands</b>							
1	Reservoirs	759	368135	36.29	343894	212394	38.23
2	Tanks/ponds	15845	208669	20.57	183229	71553	60.94
3	Waterlogged	37	310	0.03	134	83	61.44
	<b>Total</b>	<b>16641</b>	<b>577114</b>	<b>56.89</b>	<b>527527</b>	<b>284030</b>	<b>46.15</b>
	<b>Total inland</b>	<b>20219</b>	<b>886148</b>	<b>87.35</b>	<b>753846</b>	<b>337935</b>	<b>55.17</b>

**Table 2. Coastal wetlands in Maharashtra**

<b>Coastal Wetlands - Natural</b>							
Sr No.	Category	Number of wetlands	Total Wetland Area ha	% of wetland area	Open water monsoon Area ha	Pre-monsoon area ha	% change in area ha
1	Creeks	162	41636	4.10	35914	25376	29.34
2	Sand beach	400	4873	0.48	-	-	
3	Intertidal mud flats	752	22249	2.19	-	-	
4	Salt Marshes	32	614	0.06	-	-	
5	Mangroves	1270	30238	2.98	-	-	
<b>Coastal Wetlands - Man-made</b>							
1	Salt pans	205	7025	0.69	7003	7000	0.04
2	Aquaculture ponds	6	71	0.01	71	46	35.21
	<b>Total - Coastal</b>	<b>2827</b>	<b>106706</b>	<b>10.52</b>	<b>42988</b>	<b>32422</b>	<b>24.57</b>
	<b>Sub-Total</b>	<b>23046</b>	<b>992854</b>	<b>97.86</b>	<b>796834</b>	<b>370357</b>	<b>53.52</b>
	Wetlands (<2.25 ha), mainly Tanks	21668	21668	2.14	-	-	
	<b>Total</b>	<b>44714</b>	<b>1014522</b>	<b>100.00</b>	<b>796834</b>	<b>370357</b>	

Area estimates of various wetland categories for Maharashtra, carried out using GIS layers of wetland boundary, water-spread, aquatic vegetation and turbidity is shown (Table 3).

**Table 3 Inland wetland area under aquatic vegetation in Post Monsoon and Pre Monsoon Season in Maharashtra**

Parameter	Post Monsoon	Pre Monsoon	% Change (+/-)
Area under Aquatic Vegetation	47551	84702	+ 78.12

**Table 4 Inland wetland area under turbidity levels in Post Monsoon and Pre Monsoon season in Maharashtra**

Area under turbidity levels	Post Monsoon	Pre Monsoon
Low	633128	202581
Moderate	139816	159856
High	23890	7920

The total wetland area estimated in the state is 1014522 ha that is around 3.3 per cent of the geographic area. The major wetland types are Reservoir/barrages accounting for 36.29 per cent of the wetlands (368135 ha), Tank/Ponds accounting for 20.57 percent of wetland area (208669 ha), river/stream accounting for 29.54 percent of wetland area (299730 ha), creeks with 4.10 percent and mangroves with 2.98 percent of wetland area (41636 ha and 30238 ha respectively).

Wetland status in terms of opens water showed that post-monsoon water spread as expected is significantly more (796834 ha) than during pre-monsoon water spread (370357 ha). On the other hand, the area under aquatic vegetation is more during pre monsoon (84702 ha) than during post monsoon (47551 ha). This could be because of the accumulation of nutrient load and spread of vegetation in the relatively shallow water during the season. The qualitative rating of turbidity of open water in the wetlands is low to moderate in both the seasons.

**The type wise wetland distribution in the state**

The state’s cost line stretches for 720 km with coastal wetlands comprise only 10.56 % of the total wetlands of Maharashtra. In inland wetlands (# 20219) a majority 16641, are manmade wetlands and 3578 are natural wetlands. The total area under inland wetlands in the state is 886148 ha. Area wise also the man made wetlands comprise major part (65.12%) and natural wetlands, including rivers, occupy 34.87% of the state wetland area.

The State has thirty five districts. The geographic area varies from 17048 sq. km (Ahmednagar) to 69 sq. km

(Mumbai Urban). The wetland area in each district as per cent of total state wetland area ranges from as 0.08% in Mumbai Urban to 6.72 % in Pune district. The wetland area in the districts as per cent of geographic area varied from 24.87% (Mumbai Suburban) to 1.76 % (Buldhana). Pune, Nasik, Thane, Ahmednagar are wetland rich districts contributing more than 5.0 per cent of the total wetland area of the state, followed by Chandrapur, Nagpur, Aurangabad and Raigadh districts with 4-5 per cent each.

District-wise distribution of wetlands in relation to rainfall zoning showed that in the high rainfall Konkan subdivision (with 7000 mm rainfall), Thane is the leading wetland district (with 5.91% area). In the assured rainfall zone of Nagpur Division and Amravati Divisions (with 1000 mm rainfall) Nagpur and Yavatmal are the wetland rich districts contributing 4.12 % and 3.37 % respectively to the state wetland area. In the scanty and rain shadow regions, Pune district is wetland rich with 6.72 per cent contribution to state wetland area. The wetland types in scanty rainfall districts are mainly man made one, with more number of Reservoirs/ barrages and Tank/pond. Gondiya district has highest concentration of small wetlands (<2.25 ha).

**Need**

The basic need for the wetlands conservation, as portrayed by most in the development scenario, is the water supply to the growing human demands as wants and not the basic needs. Also the nature of these demands is rapidly changing from needs in the rural areas to semi-urban and urban areas with modern life styles with ever increasing consumption patterns. The problem of sustained

water supply is further aggravated by population increase and immigration in Maharashtra.

It is therefore necessary to re-stress on the traditional values in water conservation i.e. cultural, spiritual, ecological, biodiversity, habitats, hydrology, basic life support system, utilitarian values; aesthetic value, agriculture, city water supply, industry and future values etc. Otherwise if present level of exploitation and degradation of the water resource continues, sooner it will reach a point of no return and the damage will be permanent and non recoverable. It is therefore essential that by using all the green technologies at our disposal attempts should be made at every level to try to change the present attitudes and patterns towards water use and motivate the people to participate in water resource conservation movement.

### Threats

The nature of threats to fresh water resources is almost uniform across the state, though some of them may be site specific. The major threats identified in the state vary in character and intensity. The main causes being change in land use, catchment degradation, water uses - misuses, drop in ground water level, domestic and industrial pollution, Eutrophication. Intrusion of exotic weeds, local biodiversity loss, crossing of carrying capacity of wetland, climate change, droughts, floods, disaster, social-economic-regional disparities and issues, and local and trans boundary conflicts. Most of these cause negative and cumulative environmental impacts and are incremental with time having long-term effect. The changing attitude of the people for modern lifestyles and the dilemma between Growth Vs Development are some of the common factors in aggravating the threat perception in rapidly industrialising state of Maharashtra.

### Potential

The conservation of such a large number of wetlands in the state, though a necessary asset, cannot be done in one go even if people and the government are convenience to do so. To begin with we need to identify the potential of individual wetland and prioritise use of its available water from all the major wetlands i.e. reservoirs, Minor irrigation tanks and even local tanks and ponds. Every social need is explicit, site specific and requires a definite quality and quantity of water. Besides, government policy needs to be pragmatic and should be implemented judiciously with peoples' participation for use of available water from all sources i.e. rivers, large reservoirs, medium and minor dams, local tanks and ponds. The local agriculture pattern also needs to be based on the regional agro-climatic conditions and locally available water resource. The long talked river basin approach for

irrigation on the basis of equitable distribution of water to all the stake holders in the basin should be implemented at the earliest. The ad-hoc diversion of water for non priority use such as from drinking purpose to industrial purpose, as normally done under political interventions routinely, should not be encouraged at any cost. Considering the acute water shortage in the state, recently the State Water Resources Ministry has strongly recommended mandatory use of drip irrigation technology for water intensive crops like sugarcane and banana cultivation. The encouragement for drip irrigation will allow farmers to grow more than one crop by efficient use of available water. This recommendation coincided with the release of the White Paper on irrigation projects in the State. This is a much awaited well come change in the government policy, however not on self initiative but circumstantial.

In addition conservation awareness can be created about the wetlands by getting recognition for state identified wetlands as wetlands of national or international importance from Central government or International agencies. There are global organisations like Ramsar Convention Bureau and Wetland International who are dedicated to the cause of wetlands conservation. However, despite having a large number of coastal and inland wetland potential, so far the state government has shown apathy towards getting any such wetlands recognised by either Ramsar or Wetland International as wetland of international importance or from UNESCO as heritage site.

The existing 25 Ramsar sites in India represent most of the bio geographic regions in the country, however many potential sites are still missing in the Ganga plains, north-east, semi arid, Desert and Deccan. As per the important Bird Area Programme (IBA) and Ramsar criteria, BNHS has prepared a list of additional 135 wetlands which are potential Ramsar sites based on their biodiversity value, the original aim of Ramsar Convention. ( Rahamani and Islam, 2007). However, this list of additional potential sites includes only 3 sites from Maharashtra state and non from the important biogeographic regions i.e. the northern Western Ghats in Maharashtra. Where there is famous Venna Lake at 1400 MSL at Mahabaleshwar, a popular hill station. Apparently only recently initiative has been taken by the state forest department for wetland conservation in notifying wetlands with bird importance. As per the Ramsar Convention's nine specific criteria (1971), the department has identified and proposed six major wetlands in the state to the Central Government to be considered and recommended for Ramsar sites. These are one coastal wetland at Sewri in Mumbai, and five inland wetlands namely Ujni in Pune, Namdur-Madhyameshwar in Nashik, Jayakwadi in Aurangabad, Lonar in Buldhana and Navegaon in Gondia districts. ( Table 4) These six

wetlands conform most of the criteria of Ramsar Site requirements.

**Table 5 Five Inland wetlands from Maharashtra proposed for Ramsar Sites**

Name /river	Yr	location	type	Height m	Length m	Area ha	Gross storage m <sup>3</sup> m	Purpose
Jayakwadi Nathsagar, /Godavari	197 6	Paithan	earthfill	41.3	10415	18153	2909000	Irr/hydel, birds
Ujani, /Bhima	197 8	Temburni	--do--	56.4	2534	30179	3140000	Irrigation , fish
Navegaon Bandh, /Local	196 7	Navegaon	--do--	11.58	625	1305	45943	Irrigation , birds, wildlife
Nandur Madmeshwar ,/Godavari	191 6-	Nashik	-do-		barrage	608		Irrigation ,birds,ma rches
Lonar lake	---	Buldhana	Crater	669	1830	115	150m deep	biodivers ity

It is proposed that in future the Maharashtra state forest department will attempt to identify and categories more than 200 large or small suitable wetlands to be declared for Ramsar sites recognition in order to get more funds for their conservation. It is expected that after scrutiny the central government will submit the proposal for approval under the Ramsar Convention for the coveted status. When granted the status of wetlands of international importance, funds would be released by the governments for systematic conservation of these wetlands for the present and future generations. The forest department is confident that in the backdrop of the recent UNESCO World Heritage status accorded to the Western Ghats and the 39 sites therein, the case for Maharashtra's six important wetlands becomes stronger and its bid for a similar international recognition more valid.

The agriculture experts have long criticised excess use of available limited water resource by the cash crops at the cost of growing essential food grains by making them inadequate share available. Most part of western, north and south Maharashtra have large dams and depend mainly on irrigation for cultivation of cash crops such as horticultural crops like sugarcane, grapes, sapota, banana and pomegranates. According to the experts in the field of irrigation and water management there are certain hindrances in the present state planning and water policy

which are being reflected in the debate over dams and irrigation in the state today. Besides, general shortage in rainfall the current drought in the state is to some extent is manmade. There is regional imbalance in precipitation, local and regional developmental paradigm, political interventions, short term benefit oriented decisions and lack of priority and funding for completing sanctioned and ongoing irrigation projects, are some of the causes for the water scarcity in the State.

The present water supply from dams has become more undependable due to erratic monsoon season as a consequence of global warming. This is a global scientific fact and this situation is likely to be more unpredictable in the future. Therefore a more appropriate and reliable integrated water conservation and distribution policy at the state level needs to be evolved at the earliest. This should be enforced judiciously without influence from the pressures of beneficiary groups or political interventions. There is need for revised prioritisation based on needs and available water for every irrigation project for distribution of water to domestic (urban and rural), agriculture and industrial sectors. This is to be implemented and monitored by a coordination committee of the state by involving experts from water resources, agriculture, revenue, fisheries, forest and other concerned departments and independent subject experts.

Already there are excellent experiments by the locals to conserve rain water and transform the land use practices for water sustainability and agriculture productivity by using traditional wisdom and innovative water conservation techniques. People's participation in these initiatives have played a significant role in the success of these experiments which have now become demonstrative success stories for other villages Raleganshndy, Hirve Bajar are few of them from the state. Considering a vast number (#21668) of small tanks in the state (<2.25 ha), there is tremendous potential for rain water conservation and its need based use at rural level.

It was realised during the River Conservation Programme (RCP) that the lakes were subjected to increasing anthropogenic activities resulting in their degradation. The reduction in the surface areas and volume of these water bodies due to silting and

reclamation was a serious threat to their water holding capacity, ecology and natural biodiversity. The main causes were all sorts of pollution as a hindrance in drinking, agriculture and industrial water supply. Initially three lakes including Pawai in Mumbai were approved for 100% central funding in 2001. However, the scheme under National Lake Conservation Plan (NLCP) was changed in 2002 to 70:30 cost sharing between Central and State government. The present thrust of the programme is on surveys, restoration, catchment treatment, protection measures, biodiversity, conservation, pollution control, education and awareness, siltation control, weed control and research and development. The information about the state wise lake conservation projects approved by NLCP is given in Table 6.

**Table 6 : Status of lake conservation projects approved under the National Lake Conservation Plan (NLCP), MoEF, Govt. of India**

State	Lake/Tank	Date of sanction	Approved cost (in crore)
Andhra Pradesh	Banjara lake Hyderabad	2009	4.30
J&K	Dal lake	2005	298.76
Karnataka	13 Lakes		16.18
Kerala	Veli Akkulum	2005	24.56
Madhya Pradesh	Rani talav, Sagarlake Shivapuri lake	2006 2007	76.63
<b>Maharashtra</b>	<b>6 lakes/tanks</b>	<b>2001-2008</b>	<b>28.57</b>
Nagaland	Twin Lakes	2009	25.83
Orissa	Bindu sagar	2006	3.50
Rajasthan	6 lakes	2002-2010	222.31
Tamilnadu	Ooty lake Kodaikanal lake	2001 2007	12.17
Tripura	3 lakes	2005	2.02
Uttarakhand	Nainital & 4lakes	2003	64.82
Uttar pradesh	Mansi Ganga Ramgarh tal	2007 2010	147.03
West bengal	4 Lakes	2002-2010	48.51

Between 2002 to 2010 about 44 lake/tank conservation projects in 14 states have been approved under the NLCP in the country for which over 1028.19 crore rupees have been sanctioned. In Maharashtra 6 lakes/tanks have been sanctioned during period 2001-2008 and an amount of Rs

28.57 crore as assistance from central government has been approved. New proposals are in pipeline. The information about the 6 projects approved in Maharashtra by NLCP is given in Table 7.

**Table 7 Funding for wetland conservation in Maharashtra under NLCP**

Sr. No.	Name and place	Date of Sanction	Implementation / months	Approved cost in crore	GoI share	Funds released till March 2011	Revised time line
1	Powai, Mumbai	2001	-	6.62	6.62	4.70	completed
2	9 lakes, Thane	2002	-	2.53	1.77	1.77	completed
3	Mahalaxmi Vadgaon		-	1.85	1.29	1.29	completed
4	Rankala Kolhapur	2008	27	8.65	6.05	2.50+2.46	June 2010 Project delayed
5	Varhala Devi, Bhiwandi	2006-7	24	4.60	3.22	2.80	completed
6	Sidheshwar, Solapur	2008	36	4.32	3.02	2.25	
		<b>Total</b>		<b>28.57</b>		<b>15.32</b>	

### Conclusion

Maharashtra has great potential of coastal and inland wetlands. However, looking at present poor status of most of the wetlands due to anthropogenic impacts it is high time immediate and appropriate actions are taken to protect and conserve these wetlands for sustainable today and future. This needs change in attitudes at the local as well government level. The change should be reflected in long term policy and strategy for water resource prioritisation and management. People should be encouraged and involved in wetland conservation at village level by the new policy. Proper water conservation and water use strategy will bring water self sufficiency in most part of the state with minimum financial burden. This would help conserve a large number of wetlands in the state of Maharashtra. The existing legislation about environment and water use is adequate, provided implemented religiously. With recognition from international agencies like Ramsar, Wetland International, UNESCO and others, for the identified wetlands in the state there is good scope for funding under programmes like NLCP/SLCP for conservation of the wetlands in Maharashtra. Even if the present soil and water conservation programmes at village level, if implemented with proper government dedication and support and people's participation, has tremendous promise in the sustainable use of the available surface and subsurface water to meet the needs of state for a long time.

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