ISSN NO. 2320-5407

Journal homepage:http://www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

REVIEW ARTICLE

Policy Framework for Conservation of Water Bodies in Bangalore

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Manuscript Info *Abstract*

Manuscript History:

Received:12 May 2013
Final Accepted: 23 May 2013
Published Online: June 2013

Key words:
Water bodies,
Legislation, Bangalore,
Policy, Conservation,

Over the past two decades there has been a serious decline in the quality and number of lakes in the Bangalore urban region.This has resulted in a serious decline in access to water and has also affected food security, livelihoods and biodiversity potential of these wetland ecosystems. The Need for revival of conservation of water bodies was discussed. The interpretation of existing trends and scenarios in the process of conservation of lakes is based on interactions with limited key players namely government stakeholders, developers involved in similar projects and personnel involved in the field work. The state government is taking an initiative to conserve several large waterbodies in and around the city and it is in the process of identifying these areas. Legislations/ Acts directly or indirectly linked with the conservation of waterbodies but the Legislations / Act were not managed in present conditions. Several measures which the Government intended to explore the possibility towork in close partnership with the private sector in protection, conservation and sustainablemanagement of lakes.Legal framework should be properly endorsed in conserving the urban water bodies.

1.0 Introduction:

Water is a primenatural resource, a basic human need and a precious national asset and hence its use needs appropriate planning, development and management(Venkatesan, 2007). Over the past two decades there has been a serious decline in the quality and number of lakes in the Bangalore urban region due to encroachment, pollution etc. The same situation exists across the State of Karnataka. This has resulted in a serious decline in access to water and has also affected food security, livelihoods and biodiversity potential of these wetland ecosystems (ESG, 2012).

Human interference has considerably contributedtowards the deterioration of the urban water bodies in India. In India a total of 24.14 lakh ha of the areais covered with Tanks, Lakes and Ponds. In these Karnataka State contributes about 2.90 lakh ha, a total of 29.07 lakh ha of area are covered with Reservoirs. In these Karnataka State contributes about 4.40 lakh ha (DAHD, 2012).

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A study of Downinget al.,(2006) showed that the global extentof natural lakes is twice as large as previously known (304 million lakes; 4.2 million km^2in area) and isdominated in area by millions of water bodies smaller than 1 km^2. 27 million lakes with an area of > 1 hectare, 17 lakes with an area of > 10,000sq.km.And 1 lake over 100,000 sq.km.Overall about4. 6 million $km^2$of the earth's continental land surface (3%) is covered by water.

There are totally 36,568 inland water bodies in Karnataka. Out of these 33,364 tanks fall under the control of the State ZillaPanchayats and are used mainly for the purpose of irrigation.District wise distribution of Bangalore Urban and Rural district Contributes a total of 2076 water bodies.

There are 189 lakes in BBMP area, out of which 129 are with BBMP, 44 with BDA, 11 with LDA and 5 with the KFD, additional kuntes (ponds)/lakes 121 as per village maps and records (Action plan for the preservation of lakes in the city of Bangalore, 2011**)**. Over the years, the numbers of lakes,ponds and other types of water bodies in the urbanand peri-urban areas decreased continuously.The anthropogenic stress posed to the degradation of major water bodies. Bengaluru in the beginning of 1960 had 262 lakes, the urban water

bodies are under the land owning agencies like departments of revenue, fisheries,urban development, public works, municipalitiesor Panchayats. These lakes are clustered in series in accordance to their drainage patterns and valleys in which these lakes are located. In total, there are six (6) main lake series in three major valleys. Bangalore is facing acute water scarcity and expected to be increased in future Study is needed because of Lack of data on small water bodies, which are feeder tank of major lakes Conserved now, water-bodies can act as potential water sources for the future and help in maintaining ecological balance.To find out possible ways for conserving and to increase the economic value of water-bodies.

These departments fill up thewater bodies and show these cases as change ofland use patterns. The vital roles played by theurban water bodies in flood moderation andgroundwater recharge are completely underestimated, unaccounted and overlooked (CSD, 2012). The Government of Karnataka confirmed its intent to conserve lakes of Bangalore by accepting in Toto thefindings of the LakshmanRao Committee Report on "Preservation, Restoration orotherwise of the ExistingTanks in the Bangalore Metropolitan Area" per PWD GO No. 82 IMB 85 dated 11 February 1988.The Karnataka High Court comprehensively accepted Justice N. K. Patil Committee's findings and also directed that its recommendations will apply to all lakes in Karnataka and their canal networks.

In an effort to protect these lakes, the Government of Karnataka set up the Lake Development Authority (LDA) mandating it with the task of conserving these water bodies as they form a critical support system for extending water security, especially in urban areas of Karnataka. However, weak regulation has allowed for widespread encroachment and pollution of lakes and their canal networks and this has resulted in a variety of environmental and public health impacts. In addition, various traditional rights and livelihoods have been snuffed out as a result of commoditisation and commercialisation of lakes.

To stem the degradation of lake habitats across Karnataka, ESG filed a PIL (WP No. 817/2008) in the High Court of Karnataka. The Court responded by constituting a Committee under Justice Mr. N. K. Patil of the High Court, to provide a series of recommendations and guidelines to protect, conserve, rehabilitate and wisely use lakes and their watersheds in the Bangalore region. Government of Karnataka realized that to establish Infrastructure Development Department (IDD), an imperative to restore and conserve lakes (IDCK, 2009).

National Environment Policy talks aboutsetting up of a legally enforceable regulatorymechanism for identifying valuable wetlandsto prevent their degradation and enhancetheir conservation, formulate conservationand prudent use strategies for communityparticipation, eco-tourism, integrated wetlandconservation including conservation of villageponds and tanks into sectoral developmentplans for poverty alleviation and livelihoodimprovement. Several legislations in thisregard have been enacted which haverelevance to wetland conservation. Theseinclude Forest Act (1927), Forest ConservationAct (1980), The Wildlife Protection Act (1972), The Water (Prevention and Control ofPollution) Act (1974), The Water (PreventionandControl of Pollution), Cess Act (1977) andthe Umbrella provision of Environment(Protection) Act (1986).

2.0 Approach/Methodology:

Karnataka state is endowed with numerous rivers, lakes, and streams, and has a coastline of about 320 km. The spatial extent of the state is 1,92,204 sq.km (5.35% of the country's total geographical area) with a population of 52 million. The occurrence and distribution of rainfall in the state are highly erratic. It is estimated that nearly 75% of the state's area are drought prone, and the rain fall has a coefficient of variation of variance of more than 30%, which leaves the state exposed to the risk of drought. Existing Status of lakes in Karnataka was listed.

The spatial area of Bangalore in 1949 was 69 km^2. In 2001, the area increased to 151 km^2; and further expanded to about 741 km^2in 2009. In 1941 the population of Bangalore was 0.41 million and the City's area was 29 Sqkm. When the elections to the Bruhat Bangalore MahanagaraPalike (BBMP) was held in2010 its population was about 87 lakhs, with its area 800 sq.Km. It is estimated that thepopulation of the City will be around 12.5 million by 2020 (Action Plan, 2010).

When the city started getting water from Cauvery River and the agricultural lands were converted into townships, many lakes were converted into residential layouts, bus-stands and playgrounds. By 1985, there were about 43 disused tanks in Bangalore city and the areas occupied by these lake lands were utilized for various public purposes and converted into residential sites or encroached. From the topographic maps published by the Survey of India for different periods, it can be seen that till 1973 there were 379 water bodies in Bruhat Bangalore MahanagaraPallike (BBMP) region which got drastically reduced to 246 in 1996. Presently

there areonly 201water bodies out of which only 96 are perennial, 82 remain dry and the rest are seasonal (EMPRI, 2010).

Most of the water bodies in the BBMP area except the developed ones are in a state of total degradation which is mostly contaminated with sewage water inviting attendant problems of spread of algal bloom, water hyacinth, mosquito breeding, groundwater contamination etc.The Need for revival of conservation of water bodies was discussed. The interpretation of existing trends and scenarios in the process of conservation of lakes is based on interactions with limited key players namely government stakeholders, developers involved in similar projects and personnel involved in the field work.

3.0 Results and Discussion:

The loss or degradation of water-bodies can lead to serious consequences, including increased flooding; species decline, deformity, or extinction; and decline in water quality. These losses, as well as degradation of catchment, have resulted in loss of waterbodies across all continents. Decline in water quality results in increased undesirable eutrophication and algal blooms, followed by depletion of Oxygen. Most of the urban lakes and other water bodies in India are degradedmainly because of eutrophication and toxic flow (Gopalet al., 2010).

Constitutional Provisions and applicable legislations in relation to Conservation of water Bodies:In related to Water in India Central Legislations/ Acts were enhanced includes Inter-State Water Dispute Act (1956),Environment (Protection) Act (1986), Water Resources Planning Act (1992), Water (Preservation and Control of Pollution) Act (1974), River Boards Act (1956), Water Act (1974), Central Ground Water Board Act (1997),The National Environment Policy (2004),Central Board for the Prevention and Control of Water Pollution (procedurefor transaction of business) Rules (1975) and Water Rules (1975).Protection of environment and improvement were explicitly incorporated into theConstitution by the Forty-Second Amendment of Act 1976, Article 48A and Article 51A (g).Ministry of Environment and Forests has been implementing the National Lake Conservation Plan (NLCP) since 2001 for conservation and management of polluted anddegraded lakes in urban and semi-urban areas.

The Karnataka state also formulated the state legislations/ Acts which include Karnataka Cauvery Basin Irrigation Protection Act (1991), Karnataka Irrigation Act (1965), Karnataka General Clauses Act (1899), Karnataka Irrigation and Certain Other Law (Amendment) Act (2000). Appreciating the urgency and enormity of the task for the integrated development of lakes, the Department of Environment and Ecology proposed the constitution of the Lake Development Authority in 2002.However from the year 2003 the Lake Development Authority's jurisdiction has beenextended over the lakes in city municipal corporations in the State as well as lakes in the cityMunicipalities (IDCK, 2009).

Apart from these International Lake Environment Committee Foundation (ILEC) Japan (1986), Ordained Integrated Water Resource Management (IWRM), Integrated Lake Basin Management (ILBM), Ramsar Convention, Ministry of Environment and Forest, India (1985) as Integrate Conservation of Wetlands and River Basin Management, Bangalore Development Authority Act (1976), Bangalore Metropolitan Region Development Authority Act (1985), The Karnataka Urban Development Authorities Act (1987), Regulation of Unauthorised Construction in Urban Areas Act (1991), The Karnataka Panchayat Raj Act (1993),The National Environment Tribunal Act(1995),The Biological diversity Act(2002),The Karnataka Land Grabbing Prohibition Act(2011),The Karnataka Lake Development Authority Bill (2011), The Insecticides Rules (1971),Karnataka Minor Mineral Concession Rules (1994),Granite Conservation and Development Rule (1999),Wetland i.e, Conservation and Management Rules (2010).The Karnataka Preservation of Trees Act (1976), The Karnataka Public Premises Act (1974) were also directly or indirectly linked with the conservation of water bodies.

4.0 Conclusion:

Waterbodies in and around the city might finally be saved from being turned into dump yards. The state government is taking an initiative to conserve several large water bodies in and around the city and it is in the process of identifying these areas. Also which it is currently identifying. Legislations/ Acts directly or indirectly linked with the conservation of waterbodies but the Legislations / Act were not managed in present conditions.The needs to initiate efforts to restore, conserve, manage and maintain the water bodies as a valuable part of the whole ecosystem. Several measures which the Government intended to explore the possibility to work in close partnership with the private sector in protection, conservation and sustainable management of lakes. Legal framework should be properly endorsed in conserving the Urban water bodies.

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