

WATER POLICY

KOCHI MUNICIPAL CORPORATION



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WATER POLICY FOR KOCHI MUNICIPAL CORPORATION

1. NEED FOR A LOCAL WATER POLICY

1.1 Kochi, often referred to as the Queen of Arabian Sea with its all-weather natural harbour, serene backwaters, beautiful lagoons, wooded isles and a magnificent seascape, is the epicentre of fast emerging developmental activities of Kerala. Corporation manages 95 km² of city limits of Kochi. It is the most densely populated Corporation in the State with a literacy rate of 95.5%. Kochi Corporation is socially committed to provide safe and adequate water to its inhabitants in an environmental friendly and sustainable manner. However, rapid urbanization with limited water resources for utilization makes it a challenging task.

1.2 About 95% of households in Kochi depend on the Periyar river for water which is distributed after treatment by Kerala Water Authority from Aluva, a nearby town. There has been considerable reduction in the run-off of Periyar in last few decades, because of the construction of reservoirs, inter-basin transfers, watershed modifications and variability in rainfall characteristics. Deforestation and removal of topsoil affect ground water recharge and summer run-off in the river. Mudflow in the river during pre-monsoon months has obstructed domestic water supply to the city on many occasions. Many of the houses in the Corporation area have wells attached to it. Though city receives an annual average rainfall of 3000 mm in two monsoon seasons, from June to August and September to November, ground water availability is limited for consumption. This is due to high bacteriological contamination, iron content and salinity intrusion. Roads and paving in the city increase run-off and reduce infiltration thereby affecting water quality and quantity. City has so many interconnected canals

for storm water drainage. However, siltation of these canals and careless disposal of solid waste causes flash flood in many parts of the city during intense rainfall.

1.3 There are several water related issues faced by Kochi and many of these are aggravated due to rapid urbanization. These issues pose a real threat on urban water security of Kochi. Some of these issues include: increasing gap between demand and supply, water loss in the distribution network, ground water depletion, ground water contamination due to unsafe sanitation and unscientific solid waste management, salinity intrusion to inland areas, decrease in the flow of Periyar river, localized floods due to improper storm water management, etc. Apart from these issues, Kochi is predicted to be under strong impact of global climate change which will likely cause increased temperature, rainfall variability, rising sea levels and increase in salinity intrusion in the Corporation areas.

1.4 Water could be a disabler to the growth of Kochi if self-reliance is not achieved. Recent growth of Kochi as an economic hub and its inclusion in the Smart Cities project is anticipated to attract additional migrating population from different parts of the country. Consequence of such developments will be the increased demand for water to meet basic needs of growing population. If enough provisions are not created by Kochi Corporation immediately, it will see many resource sharing conflicts with adjacent Municipalities and Panchayats in the near future.

1.5 Several people have a wrong impression that water is the sole responsibility of Kerala Water Authority and local self-government has limited role in its management and conservation. There has been realization from the side of Kochi Municipal Corporation that ensuring safe and sufficient water to its citizen is in fact the responsibility of any local self-government and Kerala Water Authority is only a service provider with no active role in the governance. There is a need to review the existing water management and conservation practices being followed within the Corporation and make revisions or select the best practices to be followed for the urban water security of Kochi.

1.6 National level and state level policies are developed with a focus on the general interests of the country or the state as a whole. Their resolution is mostly insufficient to deal with the location specific water issues of a city. A local water policy within the framework of National and State water policies will be of immense use for the sustainability and management of water resources in the Kochi Municipal Corporation.

1.7 It is against this background that Kochi Municipal Corporation has identified and recognized the need for a local water policy, under the purview of Kerala State Water Policy of 2008 and National Water Policy of 2012, to prepare for the ever increasing water related challenges within the corporation area.

2. WATER ALLOCATION PRIORITIES

2.1 In general, water allocation priorities shall be broadly as follows:

- Drinking and domestic purposes
- Commercial and institutional purposes
- Tourism
- Industrial
- Agricultural production, livestock and fisheries
- Any other purposes

However, this is subjected to modification if warranted by special consideration for a location/area. Anticipating the growth of city as an economic hub, commercial and institutional use has been given priority after drinking and domestic demand. Tourism is important revenue for Corporation and therefore water demand for this sector has been given priority. Considering the need for development of industrial sector and

lower agricultural use within corporation area, priority has been given to industrial water over agriculture.

3. WATER RESOURCE MANAGEMENT

3.1 Water Distribution Network

- 3.1.1 Limitation of centralized distribution network in the Corporation area has been recognized. Population residing at the tail part of the distribution network either does not receive water or receive water with very low pressure. Decentralized water treatment plants and distribution systems shall be promoted in these critical areas with community participation.
- 3.1.2 An updated water distribution network map is lacking for Kochi Municipal Corporation area. Inaccuracies in the existing network diagrams limit scientific assessments for possible improvements. Development of an up-to-date GIS based map for the water distribution network within the corporation area shall be given due importance.
- 3.1.3 Water distribution network within the city is more than 50 year old. It is essential to evaluate the integrity of the network and understand the scope for improvements. Leakages in the distribution pipes have become a very common maintenance issue and if not attended in time causes major shut down of water distribution system in the city. A centralized complaint monitoring system shall be developed using state-of-art Information Technologies and a team to be known as “Blue Brigade” shall be organized to assist Kerala Water Authority to attend these complaints in a timely manner. Blue brigade shall be trained and equipped with state-of-the-art technologies for leak detection and underground pipe tracing.
- 3.1.4 Kochi Municipal Corporation has about 5000 public taps within its limits. Corporation pays on average Rs 7000 per tap annually to Kerala Water Authority

as water bill. Most of these public taps cause loss of drinking water due to illegal usage for washing vehicles and domestic animals. Leaks at these taps are rarely reported and therefore cause huge wastage of treated drinking water. Corporation shall therefore promote individual house connections and in due course of time phase out public tap facility within Corporation limits.

- 3.1.5 Corporation shall promote studies to look for alternate source of drinking water for distribution in case of emergencies and for future expansion.

3.2 Ground Water Management

3.2.1 As such no information is available on the number and spatial distribution of wells within the corporation area. Increasing land values and availability of water through public distribution system lured many to neglect their wells and in many case backfill the wells or ponds to reclaim the land. Legislative measures shall be enacted, wherever necessary, for ensuring protection and conservation of existing wells and ponds within corporation limits. For this, mapping of open and bore wells within the corporation limits shall be carried out with priority.

3.2.2 Ground water exploitation is a major issue faced by Corporation. Recent Ground Water Board studies show that majority of the area within Kochi Municipal Corporation is either in critical or semi critical ground water zone. Absence of permit requirement for domestic well drilling and lack of monitoring on pumping from these wells are the main reasons for ground water over-exploitation in this area. Corporation shall consider issuing license to well drillers operating within corporation limits and also control drilling of new wells in the critical zones.

3.2.2.1 Analysis of current status of ground water quality in 74 wards of Kochi Municipal Corporation revealed severe degradation due to various anthropogenic activities. Ground water present in the shallow aquifers of some of the locations was poor in quality and beyond potable limit as per the standard set by WHO and BIS.

Presence of E.coli in all dug wells indicated potentially dangerous faecal contaminations which require immediate attention. Water quality is also affected by iron and chloride. Corporation shall give due importance and priority to sanitization of drinking water wells in the corporation area. Users will be encouraged to take up rejuvenation of open wells and ponds. Regular ground water quality and quantity monitoring programmes shall be planned and implemented.

3.3 Drinking Water Supply in Tanker Lorries

Drinking water supply in tanker lorries has become a major business in Kochi city. Around 250 tanker lorries are in operation within the corporation area for supplying water every day. Corporation itself supply KWA water from Aluva in tanker lorries to many locations in the western Kochi where KWA water supply through distribution network is inadequate. However, there are many private players in the market and there is a need to ensure the quality and regulate the price of water being supplied by them within the corporation area. Quality assurance is now possible as per a recent order by Food Safety Department which require mandatory licence for water suppliers. Corporation shall consider a data upkeep system for tankers operating within corporation limits and formulate appropriate mechanisms to regulate the price of water being supplied by these tankers. All feasible projects shall be identified and pursued for replacing the tanker supply with more sustainable water supply systems.

3.4 Rain Water Harvesting

Kochi city receives about 3000 mm rain and through roof top rainwater harvesting enough ground water recharge could be achieved. Regulations and guidelines shall be introduced for roof top rainwater harvesting within corporation. Corporation shall consider for mandatory harvesting quantity as a function of roof area while issuing building permits in the critical zones. Well recharge shall be promoted as a remedial

measure for salinity intrusion, water table declination and degradation in ground water quality. Landscape interventions that increase infiltration and effective recharge shall be given due consideration in future developmental projects.

3.5 Recycling and Reuse

About 80% of the water usage within the corporation is discharged as waste water and if even a portion of this waste water can be recycled and reused, the total water demand for the city can be brought down. Corporation realizes the need for innovative technologies to treat waste water in an affordable and efficient manner. Decentralized systems which treat the waste water at the source shall be encouraged more than centralized systems which demand huge infrastructure investments and are impracticable considering the topography and hydro-geological conditions of Kochi. Corporation shall consider formulation of mandatory regulations for recycling and reuse of waste water in large apartment and commercial complexes.

3.6 Desalination

Desalination technologies that could separate-out potable water from saline water shall be of use for western parts of Kochi Corporation where there is a large gap between demand and supply. Due to the large distance from the fresh water source, it is an expensive affair for Kochi Municipal Corporation to supply drinking water in West Kochi and nearby areas. Corporation pays around Rs 200,00,000 (Two Crore Rupees) annually for distributing KWA drinking water from Aluva to West Kochi in tanker lorries. Corporation shall promote community based projects that use innovative desalination technologies to deliver drinking water in water scarce areas at a reasonable price. Preference shall be for decentralized systems that are energy efficient.

3.7 Wetland Conservation

Wetlands are home to exceptional biodiversity and are essential in controlling floods, recharging ground water and maintaining water quality. Wetlands in the

Corporation limits are facing serious destruction and degradation due to anthropogenic activities including pollution and reclamation. Actions shall be initiated to regulate these activities and promote wise use of these water bodies.

3.8 Water Audit

Water audit is the qualitative and quantitative analysis of water consumption to improve water use efficiency. It helps in reducing misuse and over use of water. Recent water audit in an apartment complex within Kochi Municipal Corporation conducted by SCMS Water Institute showed that the water bills could be reduced by almost 30% after implementing water audit recommendations. Corporation understand the importance of water audit as a best practice for water management and conservation. Due consideration shall be given by Kochi Municipal Corporation to formulate a regulation that makes it mandatory for large apartment complexes, institutions and commercial complexes within corporation limits to submit a water audit report every 3 or 5 years.

4. WATER LITERACY

Recent survey conducted by Kochi Municipal Corporation shows that only 24% of population who participated in this survey have adopted any kind of water conservation measures at their homes. This shows the dearth of water related awareness among the public. Corporation consider it as a priority to improve the water literacy rate and envision becoming first water literate local body in the country. Corporation shall plan and implement water literacy programmes in the coming years. Some of the programmes that are being considered include creating a “Water Brigade” to spread awareness among the public, creating water clubs in the schools and engage students within the Corporation area and organizing an international water expo that shall be named as “Kochi Water Meet”.

5. TECHNOLOGY AND POLICY LINKAGE

Linking policy and technology will be critical in solving the imbalance of water supply and demand. Innovations in policy can lead to important developments in technology, and, likewise, innovations in technology can lead to important developments in policy. Technologies that are expensive, energy intensive or too complex may fail when deployed in regions with limited capacities and resources. On the other hand, in some settings, simpler and less expensive technologies might be appropriate and sustainable if supported with innovative strategies. Communication between policy makers and the people who develop new technologies and implement new solutions shall be regularized and strengthened to bridge the gap existing between technology and policy making at the local level. Focus shall be on technologies under supply augmentation, demand reduction or improved management categories. Regulatory frameworks shall be developed that would encourage efficiency and innovation. Programs that would scale-up local approaches proven to be effective shall be promoted.

6. PLANNING OF PROJECTS

6.1 Water Demand Planning

Corporation shall consider formulation of regulations that make it necessary for major and medium projects to calculate and submit their water demand during construction and also during operation for getting permit. It shall also require submitting how they plan to meet this additional water demand. An assessment shall be carried out to determine the impact of the proposed project on existing water resources in the city. Preferences shall be given for proposals which do not exert much pressure on the existing water infrastructure of the corporation.

6.2 Sustainability Practices

Corporation realises the importance of sustainable development for the urban water security. Due importance shall be given to sustainability practices in all the developmental projects.

6.3 Landscape Interventions

Innovative landscape designs in addition to aesthetics can also perform as affordable solutions for rainwater recharge, storm water management and water or waste water treatment. Corporation shall give due encouragement for efficient landscape interventions that enhance urban water security.

6.4 Community Participation

Community participation shall be an important criterion in all the water infrastructure projects of corporation. As corporation shall promote decentralized systems for water distribution and waste water treatment, community participation becomes important for its maintenance and operation. Communities shall be empowered to run these projects and systems at their level.

7. CLIMATE CHANGE ADAPTATION

7.1 Sea Level Rise

Significant urban area in Kochi is predicted to be submerged under water due to sea level rise associated with global warming. Increase in water levels would alter the coastal drainage gradients resulting in flooding and intrusion of salt water in coastal aquifers. Corporation shall prepare a rehabilitation strategy for the future population in coastal zones. Focus shall be on preventive planning, adaptive management techniques and allocation of future land use, keeping in mind the probable inundation zones.

7.2 Temperature Changes

Long term analysis of mean annual temperature at Kochi shows 1°C temperature rise in the past 50 years. Forecasts shows that Kochi shall be much warmer than it is today by 2050. Such an increase means increased rates of water evaporation and demands for potable water. Measures shall be taken to reduce the evaporation losses and augment the existing supplies to meet increased demand with technology interventions such as recycling and desalination.

7.3 Rainfall Variability

Kochi experiences change in precipitation pattern in the past many years. Though the number of rainy days decreased, intense rainfall with short spells has increased there by increasing the risk of flooding and soil erosion. Intense rainfall with short spells also decreases the rainwater recharge to underground aquifers as the storm run-off quickly flows in to the sea and creates water shortages in the following summer season. Corporation shall promote roof top rainwater collection and recharge of wells and ponds as an adaptation strategy. Regulations shall be formulated to decide on the total area of impervious paving allowable in construction projects for enhancing rain water infiltration.

7.4 Storm Water Management

Kochi has a canal based drainage system. Severe water logging and flooding which disrupt the traffic movement and normal life is common in Kochi during rains due to poor maintenance of city canals. Operation and maintenance of the drainage network need better coordination between several agencies such as local bodies, irrigation department, PWD etc. Proposals shall be made to establish multi-agency coordination and assess the adequacy of drainage system in the city. Flood monitoring and forecast systems shall be introduced as a priority. Measures shall be taken to control dumping of solid waste into the drainage canals.

7.5 Disaster Management

Risk reduction measures shall be implemented to deal with climate change induced disasters such as flood, draught, tsunami and outbreak of water borne diseases. Community based exercises shall be planned to enhance the capacity of communities to adjust to the effects of disasters. A resource inventory shall be carried out to list out the areas and facilities which could be used for rehabilitation during emergency.

8. DECOUPLING THE DEPENDENCE ON NATURAL WATER

Kochi Corporation aims to achieve decoupling between the total water supplied and total water derived from the natural environment through surface and ground water. Decoupling happens when the upward trend in water demand deviates from the rate at which regional natural water can be further developed for productive use. It will ensure eventual levelling off of natural water use at an environmentally sustainable level. Corporation aspires to achieve decoupling in two different ways. First method involves augmenting local water supplies by the import of virtual water, in the form of water intensive food and other commodities, to meet the demands driven by population increase and socio-economic development. In that way the water that may be otherwise used for agriculture, poultry, aquaculture or other industrial production within the corporation limits can be redirected to urban water supply. These imports result in a decoupling of the total levels of water required by an economy from the levels of natural water resources available. In the second method, decoupling will sever the link between internal water use and local availability of natural water resources. It will target demand management through recycling and reuse of urban water and appropriate augmentation of supplies including via desalination.

9. INLAND NAVIGATION

Water transportation is the most economical mode of transportation as it does not demand huge investments in infrastructure like roads. Kochi is abundantly blessed

with waterways that touch up every major part of the city. Kochi city has 3 national water ways and 14 inland water ways. However, only a small stretch among these is currently used for navigation. Most of the inland channels stay either clogged or weeded. Proper maintenance of these waterways shall be a priority to develop majority of the available areas into waterway accessible areas. This shall help in redistribution of population in the city to newly accessible locations and reduce the water stress in other crowded areas and also keep the inland waterways in healthy condition. Innovative projects shall be taken up to improve the inland waterways within the Corporation.

10. SANITATION AND WASTE TREATMENT

Lack of adequate and safe sanitation is the major source of contamination for city's water resource. Kochi Corporation has recently done a detailed assessment of sanitary conditions in Kochi and come-up with a city sanitation plan to address current and future sanitary requirements of the city. Strategies and action plans suggested in the city sanitation plan shall be pursued to ensure safe sanitation within the corporation limits.

11. WATER AND HEALTH

Ensuring safe-drinking water within the limits of Corporation shall be the responsibility of Kochi Municipal Corporation. Sanitization of wells and controlling the discharge of untreated waste water near human settlements shall be done as a priority to prevent water borne diseases. Corporation shall formulate an emergency preparedness plan for dealing with water borne disease outbreaks. Awareness campaigns will be promoted in the parts of the city where water borne diseases have been reported regularly.

12. DATA MANAGEMENT CENTRE

Recent scientific studies by Kochi Municipal Corporation have produced large datasets on water quality and quantity within the Corporation area. More water related data are available from various government and non-government departments such as CWRDM, KWA, and KSPCB. It is also anticipated that Corporation will generate additional data on water quality and quantity in the coming years by implementing routine monitoring programmes. There is a need to have a centralized data repository where all the mentioned data can be stored and make it easily accessible to anyone in the public who would want to utilize these datasets for scientific analyses, thereby adding value to these data. Kochi Municipal Corporation envisions developing a Kochi Water Information System (KWIS) which shall be a central repository for any water related data from within the Corporation limits. Advancements in the field of information technology shall be utilized for this data management system.

13. RESEARCH, TRAINING AND CAPACITY BUILDING

Due importance shall be given for research, training and awareness campaigns related to water. Corporation shall encourage capacity building programmes for ASHA (Accredited Social Health Activist) workers, women self-help groups (Kudumbasree) and anganwadi workers within the Corporation limits. Various training programmes shall be organized in association with reputed academic institutes in and around the city. A portion of annual budget shall be earmarked for funding research proposals from government and non-government institutions and academic society with a focus on improving water scenario in Kochi Municipal Corporation.

14. FOLLOW-UP

Kochi Water Policy 2015 as elaborated in the aforesaid paragraphs underlines the need for urban water security and gives directions for sustainable management of water resources of corporation. This policy would be reviewed periodically in view of changing needs of the Corporation. The policy statement shall be supplemented with implementation strategies and operational action plans for realizing the water policy objectives.