

Proposed Action Plan for Rejuvenation of River Tunga



Karnataka State Pollution Control Board

“Parisara Bhavana”, # 49, Church Street,

Bengaluru - 560 001

January 2019

INDEX

| Sl. No. | Topic | Page No. |
|----------------|---|-----------------|
| 1 | Introduction to Tunga River | 3 |
| 2 | Sources of Pollution - Municipal Sewage generation and Treatment | 4 |
| 3 | Characteristics of River water quality | 4-5 |
| 4 | Action taken by the Board | 5 |
| 5 | Action to be taken for Rejuvenation of River Water Quality | 5-6 |
| 6 | Cost component involved in the Restoration of Polluted stretch | 6-7 |
| 7 | Status of Environmental Flow (E-Flow) | 7 |
| 8 | Short Term and Long Term Action and the Identified Authorities for initiating actions and the time limits for ensuring compliance | 7-11 |

Proposed action plan for Rejuvenation of River Tunga

- 16. State : Karnataka**
- River Name : Tunga**
- River Stretch : Shivamoga to Kudli**
- Priority : V (BOD 3-6 mg/l)**
- BOD Max.Value: 4.3 mg/L**

1. TUNGA RIVER AT SHIVAMOGGA CITY:

The Tunga river is born in the Western Ghats on a hill known as Varaha Parvata at a place called Gangamoola. From here, the river flows through two districts in Karnataka - Chikmagalur District and Shimoga District. It is 147 km long and merges with the Bhadra River at Koodli, a small town near Shimoga City, Karnataka. The river is given the compound name Tungabhadra from this point on. The Tungabhadra flows eastwards and merges with the Krishna River in Andhra Pradesh. **The total polluted stretch of the River about 10 kms from Shivamogga to Kudli.**



Figure 1. The Tunga River Stretch

2. Major Pollution Sources:

- a) The main source of pollution from Shivamogga city sewage.
- b) The other source of pollution is from bathing, washing of clothes and vehicle washings and other anthropogenic activities.
- c) Non point sources from agriculture fields etc.,

2.1 Treatment of Sewage:

The City Corporation, Shivamogga is having a population of 3,22,650 as per 2011 census. The source of water is from Tunga river. The Construction of Sewage Treatment Plant of capacity **35.58 MLD** is commissioned. This STP covers the sewage generated from the left side area river of Tunga river, for the right side area of Tunga river they have proposed a STP of capacity **5.13 MLD** which involves SBR technology and the work is yet to be taken up. There is an old STP of capacity 5.13 MLD and is not functioning. The treated sewage from the polishing pond is discharge into Tunga river. **75% of UGD facility has been provided Shivamogga (CC).**

2.2. Municipal Sewage generation and Treatment

The Town wise sewage generation and treatment capacity developed so far is provided in **Table-1**

Table-1: Status of Domestic Pollution in River - Tunga

| Sl No. | Name of the local body | Type | Total Sewage generation in MLD | Total Capacity of Sewage treatment in MLD | Status of STP |
|---------------|-------------------------------|-------------|---------------------------------------|--|------------------------|
| 1 | Shivamogga | CC | 13 | 35.58 | Operational at present |

3. Characteristics of River water quality:

The monitoring results of **Tunga** River At Downstream of Shivamogga for the year 2017 & 2018 are shown in **Table-2**. River water quality conforms to **Class D-** means water is fit for Propagation of wild life, fisheries.

3.1. Status of Water Quality

The details of parameter and specific concentration are provided in **Table-2**

Table-2 : Status of Water Quality of River - Tunga

| Year | Locations | DO (mg/L) | | BOD(mg/L) | | Fecal Coliform (MPN/100ml) | | Total Coliform (MPN/100ml) | | Class |
|------|------------------------------|-----------|-----|-----------|-----|----------------------------|--------|----------------------------|--------|-------|
| | | Min | Max | Min | Max | Min | Max | Min | Max | |
| 2017 | At Down stream of Shivamogga | 6 | 8 | 2.5 | 3.6 | 1400 | 100000 | 3000 | 180000 | D |
| 2018 | | 6.6 | 7.6 | 3 | 5 | 1100 | 90000 | 2800 | 160000 | D |

4.Action taken by Board:

1. City Corporation, Shivamogga has been informed to provide UGD for the entire city and STP to the whole corporation area and to treat to the standards prescribed by the Board and to make use of the treated sewage for irrigation / secondary purposes. In this regard, they have been advised to submit action plan for the treatment of entire sewage and utilization of which includes solid waste management.
2. The Karnataka Urban Water Supply and Drainage Board has started the work of wet wells, UGD Schemes. The Urban Water Supply Board has reported that they will complete the balance work within one year.
3. The criminal case has been filed by Regional Office, Shivamogga against the Commissioner, City Municipal Council, Shivamogga in view not compliance under the provisions of Water Act.

5.Action plan to be taken for Rejuvenation of River water quality:

- The CC Shivamogga shall provide 100% UGD system to the entire city.
- The CC Shivamogga shall provide terminal sewage treatment plant to treat the sewage to the standards stipulated by the CPCB.
- The CC Shivamogga shall stop discharge of un-treated / treated sewage directly in to the river. Treated sewage shall be utilized for irrigation purpose.

- Municipal solid wastes including poultry and slaughter house wastes shall be disposed only in MSW sites as per MSW guidelines and shall not be disposed on river banks.
- Vehicle washings and other activities shall be regulated.
- There shall not be discharge of sewage or sullage in to storm water drains. If any discharges are there same may be regulated by taking measures not to discharge into river.
- River cleaning and rejuvenation activities like removal of sediments, weeds etc., shall be undertaken.
- Caution display boards at strategic points shall be displayed.
- Creation of buffer zones on either side of the river bank and developing green belt in that area.

6.0. Cost component involved in the Restoration of Polluted stretch

Cost component shall be an integral part of Detailed Project Report (DPR). Most of the cities and towns are deficient in treatment of its total sewage generated. In order to cater each identified town on the bank of polluted river and gaps observed between total sewage generated and treatment capacity needs to be considered for planning.

Cost component shall invariably depend towards construction, operation and maintenance of sewage treatment plant. On an average Rupees 2.5 Crore has been estimated as Capital Cost per MLD (for primary, secondary and Tertiary treatment) excluding Operation and maintenance cost for all the available conventional and recent technologies. In some cities and towns developed capacity of STP is fully or partially underutilized due to inadequate sewerage network and other implementation issues.

Total estimated cost of **Rs1.0 Crores** should be made budgetary provision by local bodies for operational and maintenance of existing STPs in the identified cities along the Tunga River. Total cost of rupees **9.39 Crores** is already made budgetary provision for shivamogga city by Government.

Table -3: Cost Component involved in the Rejuvenation of Polluted Stretch of Tunga

| Sl. No. | Activity | Cost in Rupees |
|---------|--|--------------------------|
| | | Shivamogga |
| 1 | Operation & maintenance (O&M) cost for existing STPs per annum | 1.0 Crore |
| 2 | Capital cost including O&M for proposed new STPs | 9.39 Crore (5.13 MLD) |
| | Total Rupees | 10.39 Crores |

7. Status of Environmental Flow (E-Flow) :

The details of Flow (discharge) is provided in **Table-4**

Table-4 : Status of E-Flow of River - Tunga

| Year | Hydrological Observation Site | Flow (m ³ /s) | |
|------|-------------------------------|---------------------------|-------|
| | | Min | Max |
| 2016 | Shivamogga | 0.708 | 37.26 |
| 2017 | | 0.173 | 19.71 |

4. **Action Plan-** Short Term and Long Term Action and the Identified Authorities for initiating actions and the time limits for ensuring compliance.

Short term and long term action plans and the implementing agencies responsible for execution of the action plans and the time limits are given in table as below :-

| Sl. No | Action plan for rejuvenation of river Tunga | Organisation/ Agency Responsible for Execution of the Action plan | Time Target |
|-----------|---|---|-------------|
| I. | Industrial Pollution Control | | |
| | (a) Compliance of industries located in catchment area with respect to effluent discharge standards and its | KSPCB | Complied |

ACTION PLAN FOR REJUVENATION OF RIVER TUNGA

| | | | |
|--|--|---|---------------------|
| | disposal as per consent conditions | | |
| | (b) Inventorisation of the industries in the catchment area of River Tunga covering assessment on aspects relating to Status of Consents under Water & Air Acts and Authorisation, Effluent Generation, ETP capacities and final mode of effluent discharges | KSPCB | Complied |
| | (c) Actions against the Identified industries in operation without Consents under Water & Air Acts/Authorisation under the H&OW (M & TM) Rules, 2016 as amended | KSPCB | Complied |
| | (d) Action against the industries not installed ETPs or ETPs exist but not operating or ETP outlet or treated effluent is not complying to the effluent discharge standards or norms | KSPCB | Complied |
| | (e) Action against the red category industries for installation of OCEMS and not transferring data to CPCB and KSPCB | KSPCB | Complied |
| | (f) Small scale/tiny and service providing units located in urban or semi-urban limits like Dairies, Auto Service Stations to have minimum provision of O & G traps | Local Authorities (Shivamogga)/DMA | Within three months |
| | (g) Prohibition of Burning of any kind of waste including agro-residues | State Govt./District Administration and Local authorities (Shivamogga)/ and Agriculture Department | Within three months |

ACTION PLAN FOR REJUVENATION OF RIVER TUNGA

| | | |
|---|---|---------------------|
| (h) Directions to all the Industries which are observed to be not in operation or closed or temporarily closed to remain close till further orders fromCPCB. | KSPCB | Within three months |
| (i) Estimation of industrial effluent generation and the existing CETP capacity and to arrive gap between the industrial effluentgeneration and the existing treatment capacity | KSPCB | Not Applicable |
| (j) Channelization of industrial effluents to CETPs for ensuring treatment to comply with the discharge standards. | KSPCB and District /Local Administration | Not Applicable |
| (k) Identification of suitable site within industrial estates, Execution and Commissioning of Adequate Capacity CETPs. | State Government , District/Local Administration /KIADB | Not Applicable |
| II. Sewage Treatment and Disposal Plan | | |
| (a) District-wise estimation of total sewage generation, existing treatment capacities, quantum of disposal of sewage presently through drains and the gaps in sewage treatment capacity. | State Government, KUWS & DB, District Administration and local bodies (Shivamogga) | Within six months |
| (b) To undertake measurement of flow of all the drains presently contributing pollution load in river Tunga and to formulate detailed project report (DPR) for each drain and corresponding town and submission of DPR. | State Government, KUWS & DB, District Administration and local bodies (Shivamogga) | Within six months |

ACTION PLAN FOR REJUVENATION OF RIVER TUNGA

| | | | |
|------------|--|--|--|
| | (c) Proper design, execution of STPs with full utilisation capacity | State Government, KUWS & DB, District/Local Administration | Within 24 months |
| | (d) Channelization including diversion of sewage generated from household/townships/villages to sewer lines/interception of all the drains presently carrying sewage and for ensuring proper treatment through the upcoming STPs | State Government, KUWS & DB, District/Local Administration | Within 18 months |
| | (e) Ensuring dairy/automobile service stations and Hotels / Restaurants particularly located on road-side should have a treatment system and levy of fine in case found Violations | Local authorities/DMA | Within three months |
| III | Ground water quality | | |
| | (a) Sealing of contaminated hand pumps and found to be unfit for drinking purpose by the public | State Government, Karnataka rural drinking water and Sanitation Department and Local authorities | Contaminated ground water is not noticed |
| | (b) Supply of potable water to the affected communities in the identified critical blocks | State Government, Karnataka rural drinking water and Sanitation Department and Local authorities | Not Applicable |
| | (c) Carrying assessment of ground water survey for quality and to identify over exploited and critical blocks in the district (Shivamogga). | Karnataka Ground Water Authority | complied |
| | (d) To conduct periodic surprise inspection of the industry to rule out any forceful injection of industrial effluents into ground water resources | KSPCB/ KGWA | complied |

ACTION PLAN FOR REJUVENATION OF RIVER TUNGA

| | | |
|--|---|--|
| (e) All the industry should be directed to obtain NOC from the CGWB and action against the Units in Operation without obtaining of NOC from CGWA | KSPCB,CGWB/ CGWA and Karnataka .Ground Water Department | The proposed new industries will be directed to obtain NOC from CGWA |
| (f) To ensure rain water harvesting by the industrial, commercial and other institutions and groundwater recharging with only clean water be encouraged by CGWB/CGWA | CGWA/ Karnataka Ground Water Department | Complied |

| | | | |
|-----------|---|---|----------------------------|
| IV | Flood Plain Zone (FPZ) | | |
| | (a)Plantation in Flood Plain Zone (FPZ) | Karnataka State Forest Department | Within six months |
| | (b)Checking encroachments in the FPZ of river Tunga | District/Local administration | Within six months |
| | (c)Prohibition of disposal of municipal plastic and bio- medical waste particularly in drains | Local administration | Within six months |
| | (d)Notification of Flood Plain Zone FPZ | State Government / Water Resources Department | Within six months |
| V | Environmental Flow (E-Flow) and Irrigation Practices | | |
| | (a)Measurement of flow in the river and records maintained | Central Water Commission /Karnataka water resources department | Regularly (Daily/ monthly) |
| | (b) To conserve water and good irrigation practices to be adopted by the farmers by organising mass awareness programmes and through media in vernacular language | Karnataka water resources department/Karnataka Irrigation Department and Agriculture Departments. | Once in six months |
