

Review Study on Mula Mutha River Rejuvenation Project

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Abstract: River Mula-Mutha Pune located in the State of Maharashtra lies on the western margin of the Deccan plateau, on the leeward side of the Sahyadri mountain range. It lies at the convergence of two rivers Mula and Mutha. The Mula and Mutha Rivers originate in the Sahyadri ranges and traverse across Pune city, and form Mula-Mutha River which eventually joins the Bhima River. The total length of the three rivers Mula, Mutha and Mula-Mutha traversing through Pune Municipal Corporation area is approximately 44 km. The river length covered in this project along the land is as follows:

- Mula River: Mumbai-Pune Bypass to Sangam Bridge (22.2 Km).
- Mutha River: Mumbai-Pune Bypass to Mula-Mutha Sangam (10.4 Km).
- Mula-Mutha River: Mula-Mutha Sangam to Kharadi (11.8 Km).

The Mula, Mutha & Mula-Mutha River Rejuvenation Project aims at transforming these rivers into a valuable asset for the city, creating a memorable identity for Pune. The Mula, Mutha & Mula-Mutha River Rejuvenation Project incorporates a comprehensive proposal which is unique and context specific, providing large public realm. It proposes a resilient river edge to mitigate the threat of flooding. The riverfront is proposed to be developed as a green and recreational space that can transform the existing neglected waterfront into a centre for social, cultural and recreational activities in the city.

The Mula, Mutha & Mula-Mutha River Rejuvenation Project will transform the waterfront into a vibrant socio-cultural destination and improve people's interaction with nature, developing a nature oriented sustainable public space which will improve the environmental health of the city and enhance quality of life of the residents.

Index Terms: Mula-Mutha River, Rejuvenation, River Waste, Embankment construction, River Development

1.0 INTRODUCTION

The Mula-Mutha River is a river in western Maharashtra. It arises in the Western Ghats and flows eastward until it merges with the Mula River in the city of Pune. The Mula-Mutha is a river in Pune, formed by the confluence of the Mula and Mutha rivers in the city of Pune, which later meets the Bhima River, which itself later meets the Krishna River and finally emptying into the Bay of Bengal. The project lies within Pune Municipal Corporation (PMC), Pune Chinchwad Municipal Corporation and Kirkee Cantonment Board boundary. The river area covered in this project along the land is as follows:

The total proposed area is 820 Hectares including river & river banks. Pune is located at 18°32' N & 73°51' E. It has an average elevation of 560 meters (1837 ft). At present the three neglected rivers are creating unhealthy and insanitary surroundings and are characterized by encroachments in surrounding area due to unplanned development. The city has turned its back to these rivers. In order to cope up with these current issues and create a meaningful public realm along the river, the Pune Municipal Corporation has taken up the River Rejuvenation Plan for three rivers in entire Pune Municipal Corporation area along with Pimpri-Chinchwad Municipal Corporation, Kirkee Cantonment Board & defense authorities.

The proposed project development of Mula, Mutha & Mula-Mutha River in Pune is an initiative taken up by the Pune Municipal Corporation to develop the Mula, Mutha & Mula-Mutha River in a comprehensive manner within the city limit to rejuvenate and convert the river front as an asset for the city.



Fig.1.0 Mula River



Fig.2.0 Mutha River

1.1 CURRENT ISSUES FACED AT MULA-MUTHA RIVER.

- Threat of periodic flooding.
- Choked by development.
- Polluted by outfalls.
- Polluted by nalas.
- Dry river bed.
- Inaccessible banks.
- Acts as a barrier that divides Pune.

- Neglected and underutilized Potentials.
- Variation in river width and slope gradient provides the opportunity to have variations in Cross- Section during design.
- Numerous access points (steps, ramps).
- Controlled discharge of water into the rivers by upstream dams prevents sudden floods.
- River bed has a rocky terrain as a result of which there is less amount of water loss through seepage.
- Variation in extent of development and existing land use in the adjacent land.
- Religious activities, recreational activities like boating, etc. still practiced, thus reflecting the association of people with the river.
- Heritage structures and spaces of cultural significance in adjacent areas.
- Existing gardens seen along the river length.
- Proposed public transportation like Metro and BRTS routes in close proximity to river.
- Highways and arterial roads cross the river at many locations.

2.0 LITERATURE REVIEW

D.G. Kanase “Review Study on Mula Mutha River Rejuvenation Project” studied the physicochemical characteristics of major River of Pune city in 2005. They studied and analyzed the Mula and Mutha River. The analysis was carried out for the parameters namely pH, Acidity, Alkalinity, Total Hardness, Calcium, Magnesium, Chloride, Nitrate, Sulphate and Phosphate. The data obtained by the analysis revealed that the pH is between 7.5 & 8.6, DO, Chloride, Nitrate, Sulphate and Phosphate are within the desirable limits.

Chandanshive Navnath Eknath “Review Study on Mula Mutha River Rejuvenation Project” also did the analysis on Mula Mutha River in 2013. Their paper highlights the pollution level and their impact on aquatic life. According to their studies 72 species were reported in 1942 in the river. It has been observed by the various studies that fish diversity is gradually decreasing since last 14-15 years, mainly due to increase in population and pollution load. The physio-chemical aspects of water pollution of Mula-Mutha Rivers was analysed seasonally. It is observed during their research that the level of pollution was optimum during post-monsoon and pre-monsoon seasons. In the polluted stretch of this river, many tolerant as well as air breathing fish H fossils are found at many places.

B. More, C.S. Chavan “Review Study on Mula Mutha River Rejuvenation Project” carried out the analysis of Mula Mutha River in 2014. As per result analysis, it is found that some stations are highly polluted. Different stations are polluted by different pollutant like solid waste, chemical waste, organic & inorganic waste. In present study the analysis area is confined to stretch of rivers Mula and Mutha. Mula River receives heavy loads of agricultural runoff through non-point sources. Mutha River since it passes through the city of Pune receives heavy loads of domestic sewage with some industrial waste.

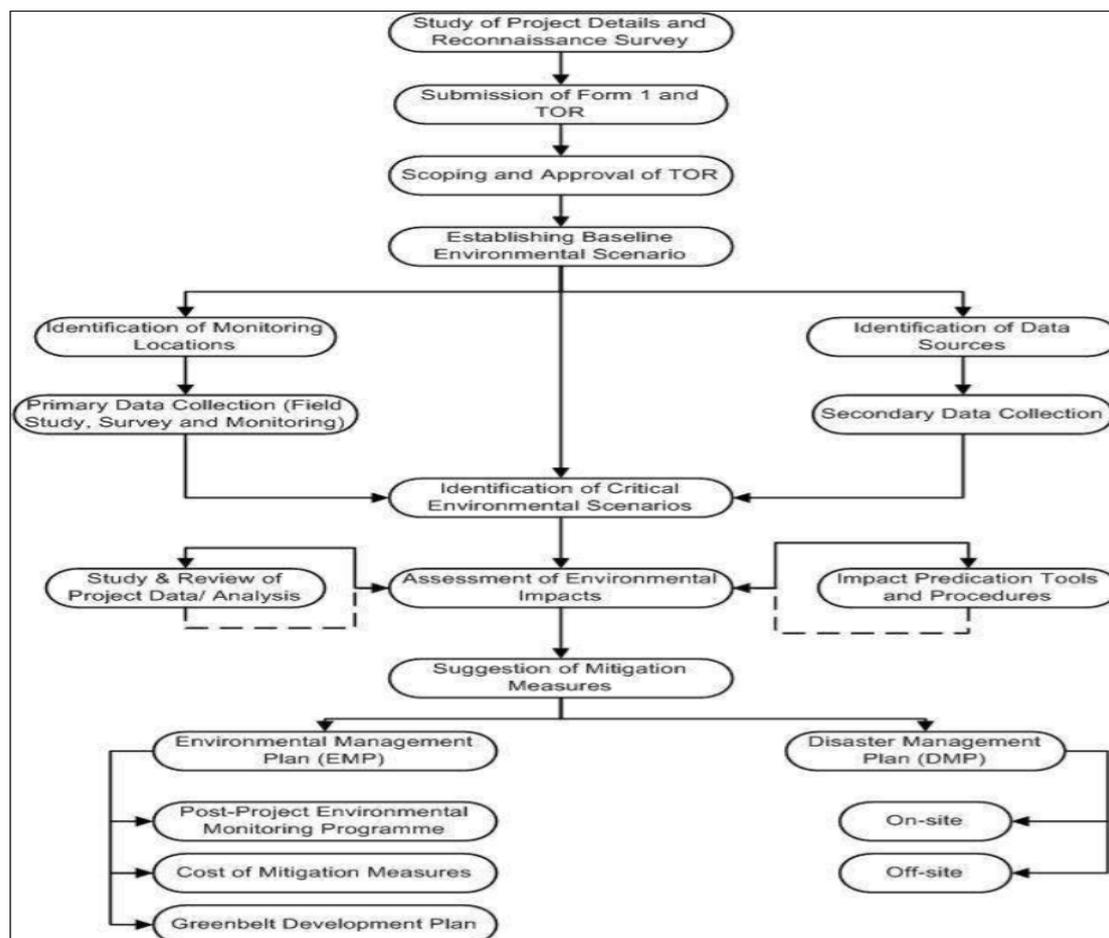
3.0 OBJECTIVES

- Reduce risk of flooding.
- Clean the rivers and make it pollution free.
- Retain and replenish water.
- Create a continuous public realm along the rivers.
- Conserve and enhance heritage structures.
- Improve accessibility and connectivity.

4.0 SCOPE

- An intensive reconnaissance and preliminary collection of environmental information to field study.
- Field studies to collect preliminary information, particularly on the quality of the physical.
- Baseline data generation and characterization of air, water, soil, noise and vegetation in the 10 kilometre radius area (impact zone).
- Preparation of Environmental Monitoring Program.
- Management plan suggesting suitable methods for mitigating and controlling the pollution levels.

5.0 METHODOLOGY



6.0 RESEARCH GAP

- Scientific development of River.
- Development of River Embankment.
- Monitoring water waste handling process.
- Development of Sustainable River solution.
- Training and Education of Slum Areas.
- To solve Issues like proper Waste Water management, and improper human resource management.
- Insufficient handling and monitoring process.
- Public Awareness.

7.0 LIMITATIONS OF STUDY

- Limitation of the study is the limited understanding of the psyche of the people impacted by a scheme of River Mula-Mutha Rejuvenation project.
- Lack of co-operation and co-ordination among various People.
- Lack of appropriate guidelines and lack of awareness about Disposal Waste in River.
- No strategic commitment by top management leading to Hazardous Waste Water.
- Several constraints such as River bank, Waste characteristics and the social practices and inhibitions exist that makes difficult for the civic agencies.

8.0 OUTCOME

- The outcomes of the domestic waste is very harmful to human being as well as animals which are living things so this waste water we can't dispose into the river so the waste water diverted to the sewage treatment plant and so outcomes of the STP is dispose to the river because they not so harmful. So that to increase the network of sewage treatment plant.
- The Pune River Rejuvenation Project will essentially reduce the threat of flooding and create a public realm along the rivers, thus, providing Pune with vital river edges that enrich life in the city. The promenades are designed to accommodate seating areas, jogging tracks and dedicated cycling tracks. Lighting, dustbins, railings etc. are planned to facilitate the activity.
- Public amenities and Utilities will include amenities such as temple ghats, visarjan facilities, parking areas, dhobi ghat, public plazas and food courts. Public amenities will ensure that the proposed riverfront is active, vibrant, viable and dynamic. Also, utilities like electric substations, pumping stations, toilets, drinking water facility etc. are also proposed along the riverfront.

- In developing area the development extends right up to the edge of the river, thus, choking it. The reasons is by outfalls, polluted by nalas, dry river bed, inaccessible Banks, etc. this to be reduce by increasing STP in river side as well as aeration, fountain in river so to help for good appear and thus to be help for pollution free river.
- Parking facilities to be available in river side so that parking problem may reduce due to increasing vehicles so that traffic problem also reduce.
- .In the river left side so many slum area and those area people his domestic waste is totally disposed to the river since that time a proper garbage dump is provided in that area and also awareness about clean and living of standard.
- The smoking is very dangerous to human being as well as drink a alcohol but many times people may drink alcohol in river side then after that a bottle may disposed in near to the river or may break the bottle in river side that's why glass piece is spread every side in river so avoid this things as well as prohibited this area so well condition to be maintain the river.
- In the river side there is many tree then this tree or small plant to be cut in high amount then this waste is totally disposed to the river hence pollution is more as well as river choking is in large amount so to avoid that a proper vehicle to be provided or it may say SPV (SPECIAL PURPOSE VEHICAL) may be provided.
- In summer Season River may dry in same surface that's why water table may decrease so a proper elevation of the surface is provided in that reason a water table of the river is constant.

9.0 CONCLUSION

Results of Descriptive Statics of Study Variables

Referring to this, the possible positive conclusions suggested for the Mula-Mutha Rejuvenation Project are as follows:-

- Aesthetic View: Designing and construction mini gardens at frequent intervals will increase the aesthetic and positive environmental impacts of the projects. These open spaces can be used as places to promote the local flora and fauna if the region.
- New Economic Zones: Provision of market places helps in development of local thriving economy for the people living in the region. Sourcing of goods and services can be done locally. These would provide job opportunities for the slum dwellers in the region.
- Recreational Hobby Spaces: These spaces can be used for practicing and developing skills and hobbies that are most suited within the region. These hobby spaces become the canter for community well-being and community upliftment.
- The Pune River Rejuvenation Project will essentially reduce the threat of flooding and create a public realm along the rivers, thus, providing Pune with vital river edges that enrich life in the city. The promenades are designed to accommodate seating areas, jogging tracks and dedicated cycling tracks. Lighting, dustbins, railings etc. are planned to facilitate the activity.
- High quality lighting is important for all public places. This will ensure that public places that are attractive in the day will remain safe, comfortable and engaging after dark. Pune has many prominent buildings; structures of cultural significance along the river that can be further enhanced by feature lighting and add to the aesthetic appeal and legibility of the riverfront.
- In the heavy urbanization of Pune city the river have become largely inaccessible. In order to contend with these issues to create a meaningful development of Pune city.
- For a very rapidly growing city like Pune, the principal challenge is to improve the river water and its surrounding environment thereby utilising the riverside land for recreational and other functions.
- On the other hand due care should be taken to prevent the river environment from degrading through excessive public use.
- This can be achieved by optimal land use planning for the riverfront areas and implementing the activities that are most suitable for the delicate balance of the river environment.

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