Item No.1

BEFORE THE NATIONAL GREEN TRIBUNAL
CENTRAL ZONE BENCH, BHOPAL
(Through Video Conferencing)

Original Application No.14/2023(CZ)

Jheel Sanrakhan Samiti — Applicant(s)

Versus

State of Rajasthan & Ors. — Respondent(s)

Date of Completion of Hearing and Reserving of Order : 28.08.2023

Date of Uploading of Order on the Website : 05.09.2023

CORAM: HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. A SENTHIL VEL EXPERT MEMBER

For Applicant(s): Mr. Rahul Choudhary, Adv.
(with Ms. Shreepurna Dasgupta, Adv.)

For Respondent(s): Mr. Arvind Soni, Adv.
Mr. Mukesh Pujari, Adv.
Mr. Deepesh Joshi, Adv.
Ms. Meenakshi Patidar, Adv.
Mr. Nishant Kesharwani, Adv,
(for Mr. Shoeb Hasan Khan, Adv.)
Mr. Om. Shankar Shrivastava, Adv.
Ms. Aparna Gupta, CEO, Udaipur Smart City Limited.
Dr. Anoop Chaturvedi, Scientist-B, CPCB.

ORDER

1. Grievance of the applicant is the illegal concretization of the river bed and flood plain of the Ayad River between Subhash Nagar-Ayad river pathway check and Ayad Shamshan Ghat located in Udaipur, Rajasthan. The Ayad River is a sub-tributary of the Berach River which is a main tributary of River Banas, which in turn is a tributary of Chambal River. The Chambal River is itself a tributary of Yamuna River, which in turn is the most important tributary of Ganges River. The Ayad River flows through the heart of city of Udaipur. Throughout the year, the stream remains mostly dry. However, it becomes flooded during the monsoon season, acting as one of

the larger drainage bodies for the overflow of Lake Pichola and Lake FatehSagar of Udaipur. It then flows downstream to amalgamate with the Udaisagar Lake, which is outside the Udaipur city. The River is one of the oldest river in the history of Mewar but because of increasing anthropogenic activities over time, it has become excessively polluted carrying the city's sewage and garbage. This river flowing through Udaipur is connected to almost every lake and river of Udaipur including Bada Madar, Chhota Madar, Bedla River, Govardhan Sagar, Nela Taalab, Roopsagar, FatehSagar and Swaroop Sagar.

2. The Respondent No. 4, Udaipur Smart City had started concretization of the river bed and the flood plains of Ayad River in the city of Udaipur. The project named 'Ayad River Smart Front Development and Beautification Project" (hereinafter referred to as "Ayad River Development Project") had proposed for landscaping and beautification in a phased manner via a Tender, first issued in 2020, along the 5 km stretch of the river out of its entirety of 26 km. The proposal suggested for concretization of the river for the construction of a promenade on the banks of all the proposed locations of the Ayad River. It is submitted that the proposed concretization would reduce the width of the river significantly to portray the river as a mere canal.

3. That apart from the concretization and restriction of the flow of the Ayad river, other construction activities were being undertaken as a part of landscaping and beautification drive of the Project such as walkway on both side of the river for pedestrians, development of road on the promenade, cycle track and other structures for recreational purposes on the entire width of the river channel including its adjacent floodplains and one stretch of 260 meter of the Ayad River i.e., between Subhash Nagar-Ayad River causeways to Ayad Shamshan Ghat opposite to Ahar Museum, was being concretized by Udaipur Smart City, Respondent no. 4 and Urban Improvement Trust, Respondent no. 2 as a pilot project. It involved a total

area of approximately 16 Hectares. A Toe wall had been raised in the riverbed and the flow of the river had been restricted to a narrow channel i.e. to a uniform cross section of 9 meter width in the middle of the riverbed and the floodplain adjoining it from the total width of 35 meter. Further, concrete slabs were laid around the restricted banks to form pathways for pedestrian movement. However, such construction was done without considering the fact by the Project Proponent that such a location was right in the middle of the river and its surrounding low lying area was a flood plain and hence, any construction activity on the flood plain and river bed is a prohibited activity. Furthermore, the Ayad River becomes completely flooded during the monsoon season.

4. Issue raised in this application is concretization of the flood plains and river bed of the Ayad River between Bridge New Pulla to Sevashram Bridge located in Udaipur, Rajasthan, causing impact on the environment as follows:

    (i) reduction in carrying capacity of water during peak monsoon;
    (ii) increase in the chances of flash floods in the city of Udaipur due to reduction in the carrying capacity of the river; and
    (iii) the concretization will increase the run off which will cause flooding in the area; and
    (iv) the concretization will not give the river to spread which is a natural phenomena for the rivers during monsoon; and
    (v) reduction in the ground water rechargeable capacity.

5. The matter was taken up by this Tribunal and a joint committee was constituted with direction to submit the factual and action taken report.

6. In compliance thereof, the Joint Committee consisting Water Resource Department, Udaipur, Regional Officer, Rajasthan Pollution Control Board and the District Collector submitted the report as follows:-

    "Background of the Project : Brief details of work "Rehabilitation of Ayad River in Udaipur"

1. *The River Ayad has a total length of about 26 Km. from Thur Dam to Udaisagar, The river cach from Chainage 9.5Kms. to 20.5Kms. (11Kms.) is located within the city area. In this 11 Kms. length, the present works undertaken for a length of 5 Kms. (11.20-16.20 Kms.) in the city area. The start point of the work is from Pula Anicut to Thokar Bridge Anicut.*

   To make the river flow continuously, water may not stagnate and the ground water table recharges in a better way, a project of Rehabilitation of the Ayad has been prepared. The salient features are as under-

- *The project was conceived as per the Hon'b1e CM's announcement in Budget for the FY 20-21. The total budget allocation is Rs. 75 Crores. It is funded by UIT, Smart City and Udaipur Nagar Nigam in the ration of 35 Crore: 5 Crores respectively.*

A technical committee of 10 experts was formed by the District Collector/ Vice Chairperson Board of Management, USCL. To give suggestions / recommendations for the design/items/provisions comprising of following technical officials from UMC/USCL/UIT/Irrigation, 3 retired Chief Engineers from CPWD & Irrigation as member, public representatives and 3 Professors from a Govt. Engineering College (CTE, Udaipur) as experts vide office order no. 579 Dated 10.07.2019.

Status work:-

- *The work was divided into 10 parts (8 nos. civil, 1 no. electrical& 1 no. Pipeline and pumping) and all the 10 works were tendered, work order issued and works have been started.*
- *The details or the works are as under:-*

1.	*Pula Anicut to 5 MLD STP (Kazrali house) Start point*	*800 mtr*	*Rs. 10.05 crore*
2.	*5 MLD STP (Kazrali house) toKrishnapura Causeway*	*660 mtr*	*Rs. 7.014 crore*
3.	*Krishnapura Causeway to Bhopalpura Bridge*	*600 mtr*	*Rs. 8.006 crore*
4.	*Bhopalpura Bridge toAshoknagar Anicut*	*740r*	*Rs. 8.301 crore*

5.	*Ashoknagar Anicut to Lakecity mall bridge*	*510 mtr*	*Rs. 7.160 crore*
6.	*Lakecity mall bridge to Champabagh Anicut*	*470 mtr*	*Rs. 7.481 crore*
7.	*Champabagh Anicut to Subhashnagar Anicut*	*470 mtr*	*Rs. 10.87 crore*
8.	*Subhashnagar causeway to Thokar Bridge (total length 4540 tr.)*	*290 mtr*	*Rs. 5.548 crore*
9.	*Pumping arrangements and rising main line work*	*6300 mts*	*Rs. 5.292 crore*
10.	*Highmast lights arrangements 24 nos. at 200 Mt. c/c*		*Rs. 1.439 crore*
Total cost of all works			*Rs. 71.161 crores*

The 5 kms. part of the Aayad River starts from new Pula Aniciut to Thokar bridge Anicut.

The typical cross section of the work to be conducted as under:-

During the course of site visit, the matter of Hon'ble NGT was discussed. The point wise submission provided by Smart City Officials were as under:-

1. ***Reduction in carrying capacity of water during peak season;***

   Comment*-During peak monsoon period rather the river's capacity will be increased due to the net quantity of earth being taken out. The project's features, such as gabion structure, stone masonary protection walls and stabilization by coir mats and grassing, will protect the river side slopes from erosion and debris resulting in less chances of erosion of the banks of the river and thus reducing chances of loss of human life and property. The filling of depressions where the water is stagnated causing sever health hazards shall prevent the habitants from serious disease and illness.*

2. ***Increase in the chances of flash floods in the city of Udaipur due to reduction in the carrying capacity of the river;***

   Comment*-As mentioned in the para 1 above, the carrying capacity is not being reduced and so there is no question of increase in flash floods.*

3. ***The concretization will increase the runoff which will cause flooding in the area;***

   Comment*-The project does not involve concretization, except for the walls of the low level clear water*

channel with permeable middle part and some toe walls to prevent the erosion of the banks of Ayad river, increasing in the stability of the banks and smoothing of edges of the river and most importantly levelling the depressions where the water is stagnated causing severe health hazard to the habitants. The bed of the river inside the channel will be made of stone pitching without any use of cement, so that the water may percolate to recharge the ground water level.

4. ***The concretization will not give the river to spread which is a natural phenomenon for the rivers during monsoon;***

   Comment*- the part of the river Ayad in which the project is in the question, lies inside the densely populated city area of Udaipur. There is no space for the spread of the river during monsoon. As explained earlier also, the concretization is limited to some walls of channel, toe walls, some rafts where soil starta in weak. There is no concretization on the outer boundaries of the river so as to obstruct the spread of the river.*

5. ***Reduction in the groundwater rechargeable capacity;***

   Comment—*Ayad is not a perennial river and the water comes only when the overflow of Pichhola, FatehSagar and Swaroop Sagar lakes through a Nallah called Gumania Nallah for a period of around one or two months in a year. There is no reduction in the ground water rechargeable capacity, rather the capacity will be increased due to proper channelization of the stream, addition of 10 MLD treated water (total 15 MLD) of values of BOD less than 10 PPM after disinfection into the channel and by regulating the existing Anicuts with low level gates forming low level ponds in upstream channel.*

   During the site visit the District Collector, Udaipur ask the representative of Water Resources Department to give their view point especially with respect to the carrying capacity, flood discharge, ground water

recharging and flash flood situation as they are the authority which regulate flow of water in Ayad river as well as can calculate the total discharge of water during floods and the area covered during the same. The reply given by the Xen, Water Resources Department is reproduced as under: -

- उद्यपुर शहर के उत्तर पूर्व में आयड़ नदी बहती है, जो आगे चल कर बेड़च तत्पश्चात बनास नदी के नाम से जानी जाती है।

- इस नदी का उद्रम स्थल गोगुन्दा तहसील के पहाड़ी क्षेत्र से होता है। जो कि मदार स्थित बड़ा तलाब एवं छोटा तलाब से होता हुआ आयड़ नदी एवं चिकलवास फिडर से फतहसागर से पुनः आयड़ नदी लगभग 11 कि.मी. तक उदयपुर शहर के मध्य में बहती हुई उदयसागर बांध में मिलती है।

- आयड़ नदी के जलग्रहण क्षेत्र में गुमानियावाला जिसमें फतहसागर एवं पिछोला का पानी डिस्चार्ज किया जाता है, वह नाला अलीपुर–सरदारपुरा क्षेत्र में आकर मिलता है। गुमानियावाला नाले की जल निकास क्षमता 9000 क्युसेक है, एवं अधिकतम 12000 क्युसेक है।

- वर्तमान में आयड़ नदी में मदार स्थित बड़ा एवं छोटा तालाब से 13186 क्युसेक, पिछोला से 7012 क्युसेक एवं फतहसागर से 1335 क्यूसेक पानी छोड़ा जाता है।

- शहर भाग में नदी की चैड़ाई 30 से 50 मीटर तक की है जिसमें से 10 मीटर नदी के तल को Granual Sub Base के साथ Dry Boulder Stone Wire Crate लगाया जा रहा है, जिसके दोनों और बनायी जा रही है। जिसके दोनो और Concrete Wall बनायी जा रही है। शेष भाग में Dry Lean Concrete के साथ निम्बाहेड़ा/बिजोजिया पत्थर के ब्लॉक बिच में घास के साथ बिछाये ज रहे है।

- नगर निगम उदयपुर द्वारा स्मार्टसिटी के पायलट प्रोजेक्ट में आयड़ नदी में कराये जाने वाले कार्य कथित तोर पर आयड़ नदी के मुख्य बहाव क्षेत्र में जल प्रवाह बाधा दूर करने के उपाय की योजना के साथ जल प्रवाह का वेग का वेग अत्यधीक बढ़ जायेगा।

- चूकिं यह बरसाती नदी है जो कि वषाकाल में ही बहती है अतः इसके तल में Granular Sub Base के उपर Dry Boulder Stone, एवं Dry Lean Concrete के साथ निम्बाहेड़ा/बिजोलिया पत्थर के ब्लॉक मय बीच के घास के साथ लगाने से भूजल रिचार्ज इसके बहाव के समय संयमित तो होगा लेकिन वर्षाकाल के पश्चात STP से छोड़ जाने वाले 15 MLD साफ पानी जो कि इसकी 10 मीटर वाली चैनल में बहेगा संभवतः इससे होने वाले संयमित भूजल रिचार्ज से नदी के आस–पास के क्षैत्रों के नलकूल/कुँओ के जल स्तर पर कोई विपरित प्रभाव नहीं होगा।

- नदी के बेड को प्राकृतिक स्लोप जैसा ही Granual Sub Base के साथ Dry Boulder Stone और के साथ निम्बाहेड़ा/बिजोनिया पत्थर के ब्लॉक मय बिच में घास के साथ बिछाये जा रहे है जो कि नदी के बहाव की रफ्तार में तेजी लाएगा। जिससे नदी की carrying capacity में वृद्धि होगी।

- Flash Flood की संभावना के सन्दर्भ में यहाँ यह उल्लेखनीय है कि नदी के क्वूदेजतमंउ में जहॉ वणित प्रोजेक्ट का अंतिम छोर है, के बाद के क्षेत्र में नदी की चौड़ाई ज्यादा होने से पानी के बहाव का बेग कम होगा जिससे Flash Flood की सम्भावना कम होगी। वर्णित प्रोजेक्ट की लगभग 5 किलोमीटर लम्बाई के सन्दर्भ सें स्मार्ट सिटी द्वारा नियुक्त तकनिकी विषय विशेषज्ञ की रिपोर्ट, अन्य तकनिकी दस्तावेज़ों एवं तकनिकी पहलुओं की जांच पशचात निर्णय लिया जाना उचित होगा। अतः उक्त प्रकरण में प्रथमिक निरीक्षण टिप्पणी उपरोक्त अनुसार प्रस्तुत है।

Meanwhile, the CEO, Smart City have also appointed a subject technical expert Dr. S.K. Singh, HOD Civil Engineering Department, Jodhpur for giving expert advice on the issue.

The Water Resources Department have desired the complete details during flood discharge and the above report in a preliminary report on the issue and final report shall be submitted later."

7. Notices were also issued to the respondent to file the reply and the respondents have filed the reply.

8. We have heard the learned counsel for the parties and perused, the record.

9. The submission of the learned counsel for the applicant is that the concretization in the name of beautification or the demarcation of the flood plain and the construction undertaken by the respondents had directly encroaching the river belt and the flood plains of the river Ayad. It is further submitted that as per the definition of flood plain under Section 2(a) of the Rajasthan Flood plain Zoning Act, 1990, flood plain has been defined as: "'Flood Plain" includes water channel, Flood channel and that area of nearly low and which is susceptible to Flood by inundation. The said construction zone was on the river bed and the low lying area near it, which is susceptible to flooding by inundation during monsoon.

10. The applicant has relied on *Delhi Development Authority Vs. Rajendra Singh [(2009) 8 SCC 582)* dated 30.07.2009 alongwith the definition of riverbed as follows :-

"24) Though there is no statutory definition for "riverbed" and "floodplain" from the statute, the dictionary meaning of the same is as under:

"Riverbed" has been defined as the area over which the river flows. In the Thames Conservators Case [1897] 2 QB 335 at 337 it was held that the word riverbed denotes that portion of the

river which in the ordinary or regular course of nature is covered by the waters of the river.

The "bed of the river" was defined as the area covered by the river and is the space sub-adjacent to the river over which it flows between the banks. It is the space between the banks occupied by the river at its fullest flow.

The Black's Law Dictionary, 6th Edition (Pg 154) describes a river bed as the hollow channel of a water course; the depression between the banks worn by the regular and usual flow of water; The land which is covered by the water in its ordinary low stage; The area extending between the opposing banks measured from the foot of the bank from the top of the water at its ordinary stage. P. Ramanatha Aiyer's Advanced Law Lexicon, Volume 4, 2005 Edition (Pg. 4157-4158) has described the bed of a river as the space contained between the banks; river bank in turn has been defined in the same law lexicon as the boundaries of a river throughout its width when the water flows to its maximum quantity.

"Floodplain" - Land adjacent to rivers, which, because of its level topography, floods when river overflows. [Black's Law dictionary, 6th Edn., p. 641].

It has also been defined as 'a low, flat area in either side of a river that can accommodate large amounts of water during a flood, lessening flood damage further downstream' [Fredd Michaels, 'Dictionary of Environment Studies']"

11. It is further submitted that the concretization of the riverbed and construction on the flood plain of the river Ayad has affected the natural flow of river and such activity is in violation of Section 24(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974.

12. The applicant has relied on –

    i. *Abdul Rahman Vs. State of Rajasthan* [2004 (4) WLC (Raj.) 435]
    ii. *Prof. K.P. Sharma Vs. State of Rajasthan* [2012 SCC Online Raj. 1559].
    iii. *Akash Vashishtha & Anr. Vs. Union of India & Ors.* [2013 SCC Online NGT 3230]. Where it has been stated that the construction of flood plains area is prohibited. It not only affect

the natural flow of the river but even causes environmental problems besides raises risk to human life and property.

13. Learned counsel for the respondent no. 4, Udaipur Smart City Limited has submitted that the Project does not involve concretization, except for the walls of the clear water channel with permeable middle part and some toe walls to prevent the erosion of the banks of Ayad River, increasing in the stability of the banks of the Ayad river, preventing erosions of banks of the Ayad river and smoothing of the edges of the river and most importantly levelling the depressions where the water is stagnated causing severe health hazards to the habitants. The bed of the river inside the channel will be made of stone pitching without any use of cement so that the water may percolate to recharge the ground water table. The river's capacity will be increased due to the net quantity of earth/debris being taken out. The Project's features, such as gabion structures, stone masonry protection walls, and stabilization by coir mats and grassing, will protect the river's side slopes from erosion and debris, and that respondent has not undertaken any work under the Project which will disturb the catchment areas of the Ayad River. Furthermore, the Project undertaken by answering respondent will not in any way whatsoever affect the quantum or direction of the water flow of the Ayad river as the level of rehabilitation is below natural flow surface of the river and the rehabilitation is made along the flow of the Ayad river and not impeding the natural flow river at all.

14. The Project will increase the ground water rechargeable capacity of the river. The continuous flow of treated water from two STP’s of 10 MLD & 5 MLD (situated near banks of Ayad River) directly into the channel during the lean period will enhance the level of the ground water table. The proposal to make ponds by providing gates at Anicuts will also increase the groundwater table significantly whenever required in the lean period. This treated water will be drawn from the STP’s built by latest technology of Sequential Batch reactor (SBR), the treated water will have level of BOD less than10 ppm and

so it will improve the quality of the groundwater table. It is further submitted that the aim of the project of to increase the cross sectional area of the Ayad river to ensure a smooth flow of water, which will increase the velocity of the water flowing in the river and thus increasing the discharging capacity of the river and less chances of flash floods.

15. It is further argued that the Project will not increase the chances of flashfloods in the city of Udaipur due to a reduction in the carrying capacity of the river. As mentioned earlier, the carrying capacity of the river is not being reduced. The river's capacity will be increased due to the net quantity of earth being taken out. The Project's features, such as gabion structures, stone masonry protection walls, and stabilization by coir mats and grassing, will protect the river's side slopes from erosion and debris resulting in less chances of erosion of the banks of the river and thus reducing chances of loss of human life & property. The aim of the project of to increase the cross-sectional area of the Ayad river to ensure a smooth flow of water, which will increase the velocity of the water flowing in the river. A subject technical expert from the Jodhpur University has been appointed for submission of expert advice on the issue.

16. The applicant has filed the objections in the form of response against the report of the Joint Committee and contention is that the District Magistrate who is the head of the District should not be included in the list of the Member of the Committee and the report is influenced by the doctorine of bias. It is further submitted by the applicant that the report of the committee that the velocity of the water flow will increase tremendously with the planning of the measures to remove water flow obstruction in the main area of the Ayad River in the pilot project of the smart city by Municipal Corporation, Udaipur is contrary to the facts.

17. Learned counsel appearing for respondent nos. 1, 2, 5 & 6 have submitted that they are made formal parties in the present application and the respondent no. 2 Urban Improvement Trust, Udaipur is a funding agency of

respondent no. 4, i.e. Udaipur Smart City Limited and all the actual works is being executed by respondent no. 4.

18. The matter of demarcation of flood plain zone was considered by this Tribunal in OA. No. 22/2020 (EZ) *Dilip Kumar Samantaray vs. State of Odisha Board & Ors.* where vide order dated 15.12.2020 it was observed as follows:-

> *"1. There does not appear to be any central legislation to regulate the flood plains, except a notification dated 07.10.2016 issued by the Ministry of Water Resources, River Development, and Ganga Rejuvenation, with respect to Ganga river, under the Environment (Protection) Act, 1986, prohibiting any construction in the active floodplain area of river Ganga or its tributaries. The Union Water Resources Ministry circulated a model Bill on the subject in 1975 but the same did not fructify into law. There are some State Acts like Manipur Flood Zoning Act, 1978 and the Uttarakhand Flood Plain Zoning Act, 2012. In the State of Maharashtra, there are norms for demarcating regulatory and prohibitory zones in the floodplains of the rivers[1]. Various States have taken their own legislative/administrative measures to regulate and prohibit activities in the floodplains. There are guidelines by some other States also[2]. There are also norms for no development zone, restricted zone in the floodplains of the rivers in Gujarat as referred to in order of this Tribunal dated 21.09.2020 in OA 50/2018(WZ), Nav Yuva Sanghatan & Ors. vs. The Secretary, Narmada, Water Resources, Water Supply & Kalpsar Department & Ors.*
>
> *2. The Wetlands (Conservation and Management) Rules, 2017 prohibit any permanent constructions within 50 meters of the*

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[1]Guidelines issued by the Irrigation Department of Maharashtra on 21.09.1989 as amended in the year 2018 and order of this Tribunal dated 11.07.2013 in OA 2/2013, Sarang Yadwadkar v. Commissioner, Pune Municipal Corporation, reported in 2013(1) All India NGT (Delhi) 299.

[2]i. Also see order of the Allahabad High Court as reported in news article published on 04.01.2019 in The Times of India under the heading "No construction within 500 metre of high flood level: HC" authored by Shri Rajesh Kumar Pandey (https://m.timesofindia.com/city/allahabad/no-construction-within-500-metre-of-high-flood-level-hc/amp_articleshow/67379839.cms)

ii. News article published on 29.09.2016 in The Hindu under the heading "Building along the coast" authored by Shri G. Shyam Sundar (https://www.thehindu.com/life -and-style/homes-and-gardens/Building-along-the-coast/article14644372.ece).

Wetlands, from the mean high flood level in the past 10 years from the commencement of the rules. There are also similar restrictions in certain Master Plans like the Revised Master Plan of Bangalore referred to in Mantri Tech zone Pvt. Ltd. vs. Forward Foundation & Ors. (2019) SCC Online SC 322 restricting constructions in catchment area of the lakes. We are also not aware of the legislative and administrative measures in the State of Odisha on the subject of regulating and prohibiting activities in the floodplain zones of the rivers in the State, but such an exercise appears to be necessary to give effect to the precautionary principle of environmental law, required to be enforced by this Tribunal under section 20 of the NGT Act, 2010.

3. While considering the issue of rejuvenation of identified polluted river stretches, (including Mahanadi, which is one of such polluted river stretches) the Tribunal directed that eachState must constitute a River Rejuvenation Committee (RRC) to prepare appropriate action plan and execute the same. The action plan needs to include a plan for protection of floodplains[3].

4. There are also articles in the media dealing with the subject. We may only refer to some as follows:

i. Article titled "why floodplains need to be protected" dated 12.10.2018[4] stating as follows:

> *"Damage to floodplains harms the riverine ecosystem, lessens groundwater recharge capacity and poses threats of flash floods. Enforcement of floodplain zoning regulation is a must to avert floods.*
>
> *The Kerala flood of 2018….*
>
> *xxx xxx xxx*
>
> *The lack of regulation and enforcement of land use in the floodplains added to the severity of the damage.*
>
> *xxx xxx xxx*

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[3] See order dated 21.09.2020 in OA No. 673/2018, In Re: News item published in "The Hindu" authored by Shir Jacob Koshy, titled "More river stretches are now critically polluted: CPCB".

[4] Author:AmitaBhaduri:https://www.indiawaterportal.org/articles/sad-state-floodplains#:~:text=Damage%20to%20floodplains%20harms%20the,poses%20threats%20of%20flash%20floods.&text=The%20lack%20of%20regulation%20and,the%20severity%20of%20the%20damage

Floodplains provide the space for rivers to spread their waters. When this space is missing due to encroachments, the river surges up and creates destruction.

> *"The lack of protection of river floodplains from damaging impacts like encroachment and diversion for 'developmental projects' is a tragedy that affects both the river as well as those who encroach it adversely. The river suffers as it is unable to occupy and transport flood waters downstream during high rainfall events (monsoon in particular). It is unable to recharge aquifers, wet the lands along its banks or provide life-sustaining conditions to plant and animal habitats along the river margins and banks.*
> *.....*
>
> *Damage to floodplains harms the riverine ecosystem, lessens groundwater recharge capacity and poses threats of flash floods. "People too suffer an immense loss of life and property, including loss of public infrastructure like bridges, roads, schools etc., during high floods".*
>
> *xxx xxx xxx*

5. In view of averments made by the applicant that the river beds is proposed to be affected by setting up of the Medical College or other permanent constructions in the floodplain of the river, there is need to prevent irreversible damage to the riverine ecology by enforcing the applicable rules, if any. If there are no rules, appropriate norms need to be laid down considering such norms in other similar situations in consultation with the experts."

19. The report on the subject Ayad River Front Development Project through Abatement of Pollution, River Flow Channelization and River-Front Beautification in Udaipur (Rajasthan) was filed by the Urban Improvement Trust, Udaipur, Govt. of Rajasthan by expert body, where the background as been submitted in the report are as follows :-

"1. with the rapid growth of population in the country, all the cities are bursting out of their municipal limits with the result that urban infrastructural development planning has not been keeping pace with that of the required facilities. Udaipur city is no exception to this fallacy. Udaipur, known to be city of lakes, attract lot of national and international tourists due to the presence of such lakes and other water bodies but the development scenario of the city continue to be far from satisfactory. The human activities has not only resulted in over exploitation of lakes but has made them highly polluted due to disposal of waste water thereby leading to their overall degradation in terms of quantity and quality of water.

The human activities have also not spared Ayad River which flows on the north-east side of Udaipur City and receives polluted overflow not only from city lakes (mainly Pichola and Fatehsagar) but solid & liquid wastes directly as well. As on date, Ayad River is also related to be equally polluted as the city lakes.

Of late, the city administrations viz Municipal councils/ Municipal corporations/ Urban Improvement Trusts (UIT) have started giving a serious thought to it and are exploring all possibilities for correcting the situation with engineering interventions and mobilizing central funding.

The Ministry of Environment and Forests (MOEF), Govt. of India has launched a centrally sponsored scheme namely "National River Conservation Plan (NRCP)" for river-cleaning programme with the objective to improve the water quality of major rivers, which are the main fresh water sources in the country, through implementation of pollution of abatement schemes. MOEF has constituted National River Conservation Authority (NRCA) under the chairmanship of Prime Minister with chief Ministers of concerned states as its members in 1995 (Earlier it was named as Central Ganga Authority (CGA) constituted with the launching of Ganga Action plan in 1985). NRCA has been given larger mandate to cover all the river action plan programmes iii the country. The authority is supported by the National River Conservation Directorate (NRCD) under the MOEF. The functions of the NRCA are; to approve appropriate policies for long and short term

programmes, to mobilize necessary financial resources, to review rare progress of implementation and to take all such measures as may be necessary to achieve the objectives.

The Rural Urban Infrastructure Finance & Development Corporation (RUIFDCO), Govt. of Rajasthan is accordingly formulating this scheme to remove the prevailing anomalies of pollution, water quantity& quality of Ayad River including environmental concerns with its likely funding under centrally sponsored NRCP."

20. It is further reported that :-

Malady Remedy of Udaipur City

Udaipur City ii facing lot of problems due i.e. changed scenario during the past few years such as;

- *The lush green Udaipur has transformed into basically a drought prone area of Rajasthan.*
- *The drought that occurred during the last few years has significantly affected the socio-economic profile of the area. Due to failure of monsoons, the water level in the lakes has receded considerably and ground water table also fallen.*
- *Shortage of water had multifaceted effects on the economy of the area.*
- *Udaipur is on the world tourist Map, but its drying lakes, inadequate inflow in Ayad River and no proper management of disposal of waste water has reduced the influx of tourists in the city.*
- *The over exploitation of groundwater for the purpose of irrigation has costed quantity and quality of groundwater. The problem of fluorides and salinity has developed in the area.*
- *Industrial development has also been affected due to non-availability of adequate quantity of water.*
- *Fulfilling the requirement of drinking water has become a herculean task. It requires steps to be taken for*

augmentation of water supply.

- *Service sector has been significantly affected due to migration of tribal population to adjoining Gujarat State for better employment opportunities.*

In view of the above, the planning policies conceptualized by Govt. of Rajasthan in their Master Plan for Udaipur City are highlighted below:

i. *While maintaining the importance of historical& religions places. and tourists spots in the walled city, there is need to make adequate transportation arrangements in the narrow lanes of the city and the narrow roads widened, where feasible alongwith parking lots.*

ii. *All the city lakes like Pichhola, Fatehsagar, Rangsagar and Swaroopsagar located on the west side which have special importance from the environmental angle need to the protected by proper land use planning of the surrounding areas.*

iii. *Keeping the importance of tourism in view there is need to provide better tourist facilities in the city like hotels, transportation, parks; tourist complexes etc.*

iv. *Industries causing polluti0n need not be allowed to the set up near the City from tourism angle.*

v. *The development and location of commercial centres need to be planned and provided in such a way that the local area demands could be met without Commuting long distances.*

vi. *In order to reduce the influx of heavy vehicles in the narrow roads of the city, land outside the city needs to the reserved for major establishments like Whole Sale Trade, Transport Nagar, Godowns & Storages etc. which encourage deployment of heavy transport vehicles*

vii. *Ayad River which is passing through the city area need to be protected from environmental angle. Both the banks of the river should be developed with tree plantation and greenery. In order that water keeps flowing throughout the year in the river, Mansi Wakal Project needs to be*

given practical shape.

viii. *Afforestation needs to be done in the entire Udaipur Valley and surrounding bald hills in order to check the inflow of sediment into Ayad River as well as the city lakes.*

2. *The major problems identified by the team are :-*

    1. ***Insufficient Flow:*** *The water flow in the river is insufficient due to limited catchment area, lower average rainfall, degradation of the catchment area and increasing water demand for domestic purposes.*

    2. ***Degradation of Catchment Area:*** *Due to increased human interference in the catchment area, forest is getting depleted. This has resulted in reduced vegetative cover, reduction in subsurface water flows- essential for flow maintenance during lean period. This is also causing excessive soil erosion and thus siltation of lakes and river.*

    3. ***Encroachment:*** *The river bed and banks have been encroached by the people over the passage of time because there was no firm demarcation of river boundary. In some of the stretches multi-storied buildings have come up right over the side wall of the river. This has resulted in reduction of the river cross section considerably thereby affecting the smooth flow of water in the river and also leading to flood like situations during the period of high rainfall.*

    4. ***Waste water discharge:*** *the city does not have proper sewerage system and is mainly using septic tanks at domestic levels. The overflow from the septic tanks through various open drains finds its way into the river. Some of the populated areas on the bank of the river are discharging waste water directly into the river. It is estimated that approximately 150 MLD (million liters per day) untreated domestic waste is discharge into the river. In addition 30-40 MLD of untreated / partially treated waste water from industries is also entering the river.*

    5. ***Solid Waste:*** *The city lacks scientific solid waste management system and significant part of the solid*

waste is dumped into the river which is further aggravating the river water quality situation and obstruction in smooth flow of river water.

6. ***Ground water contamination:*** *As a consequence of waste water and solid waste disposal into the river, the ground water has become highly contaminated. Use of contaminated ground water has led to reduction to agriculture productivity, contamination of vegetables.*

7. ***Siltation and Weed Growth:*** *Most of the river stretches especially in the city area is experiencing siltation and deposit of organic solids causing heavy growth of aquatic need. This has led to hyper eutrophic state and absence of oxygen in most of the river stretches.*

8. ***Bio-diversity:*** *The anthropogenic pressures in the catchment on the banks of river has resulted in degradation in bio-diversity and consequence erosion and increased silt flow in the river bed. Excessive growth of weeds in the river is resulting in breeding of vectors thereby causing disease in the area.*

The alarming situation in river Ayad and the linked lakes, is leading to flooding serious health hazards on account of contaminated surface and ground water, bio- diversity perils, unaesthetic environment to the city residents. Hence, immediate measures are required to restore quality water flow in the river and restore complete ecological balance of the system.

The Government of Rajasthan has already initiated measures for improvement of lake system in Udaipur. Two projects for conservation and management of Fatehsagar and Pichola Lakes, financed through National Lake Conservation Plan, Ministry of Environment and Forests, Government of India are under implementation. This includes desilting of lakes, purification of lake water, plantation in catchment area, development of green belts etc. Project for transfer of water from Sabarmati Basin is also under implementation.

3. Outline of Feasible Options

- *Identification of river passage and removal of encroachment*
- *Dredging / desilting of river*
- *River channelization*

- *Collection and treatment of domestic waste water*
- *Treatment of industrial waste water*
- *Solid waste management*
- *Inter-basin water transfer*
- *River front Beautification*
- *Hydrological Modeling for operation and management of water in various lakes*
- *Public awareness*
- *Creation of impounding reservoirs through rehabilitation of existing anicuts and construction of new anicuts.*

21. And accordingly it is reported that the protection of the banks of the river are essential to ensure the two aspects. The first aspect is to keep the river boundary intact and safe from encroachments and slop production and the second part is beautification.

22. It is further submitted that with rapid urbanization, private properties and colonies have come up very close to the river banks amounting to encroachment of the river boundary at many places. However, the situation can be improved for future if the river front development project is followed which envisages provision of a buffer zone on the banks where vacant land is available. Accordingly steps can be taken by local administration to protect the buffer area on the river banks from getting encroached by the people.

23. The learned counsel for the applicant has submitted that the Joint Committee in its report dated 22.08.2023 has given a clear finding that in the proposed work on Ayad river, only 9m of the bed of the river would not be concretized, and rest of the riverbed (total average width of the river is 40-50 m) would be concretized with Bijoliya stone flooring. This fact has been clearly stated in the report and in the entire report the Joint Committee has responded accepting the fact that the river Ayad is being concretized and that the Committee Report in Para 5 has advised against the concretization of the riverbed. The Joint Committee has also given the finding that the river plays a significant role in replenishing the underlying

groundwater resources of the region, and this natural process would be disrupted by the proposed concretization. The intended concrete bed will certainly damage the natural processes of the river hyporheic zone and associated recharge process, especially during the monsoon period, happening across the 0.15 KM^2 area of the river bed area within the 5-kilometer stretch. Further, to ensure adequate groundwater recharge during non-monsoon periods, it is recommended that the existing 9-meter-wide center channel's bed remains porous. However, the Committee strongly recommended that Udaipur Smart City Ltd. should conduct a hydrodynamic model study for a 100 year return period flood analysis by any independent Institute of Repute. This study should assess and compare floodwater levels at various stretches under both present and post-project scenarios.

This modeling helps to understand the flood hazard and serves as a tool which also is useful in understanding the effect of mitigation measures.

24. The contention of the applicant is that the act of concretization will not only damage the river but also in violation of orders of the court passed in following matters :-

(i) *"In the case of* ***Abdul Rahman v. State of Rajasthan [2004 (4) WLC (Raj.) 435]*** *observed that: "2. Referring to the provisions of Rajasthan Land Revenue Act 1956, it is submitted that no Nadi land can be used for any sort of construction.*

(ii) ***In Prof. K.P. Sharma v. State of Rajasthan [2012 SCC OnLine Raj 1559],*** *In the case of Abdul Rehman (supra), the Division Bench of this Court has laid down that no right can be given to use nadi land or other water body; there cannot be any activity which affects waterbody.*

(iii) *In* ***Akash Vashishtha & Anr. v. Union of India & Ors. [2013 SCC Online NGT 3230]*** *has observed that construction on floodplain is prohibited activity.*

(iv) *In* ***Manoj Misra v. Union of India & Ors. [2015 SCC Online NGT 840]*** *in the order dated 13.01.2015, it was observed that the floodplain must be demarcated, kept free from any*

permanent developments and wherever it is possible, it should be restored to its original position.

25. It is further submitted that :-

1. *That the flood plains of Ayad river needs to be identified and demarcated/zoned in order to stop human activities, as per the directions of the Tribunal in* ***Manoj Misra v. Union of India & Ors. [2015 SCC Online NGT 840]*** *held that the floodplain zoning has been accepted as an important non-structural strategy for flood management. The basic concept of floodplain zoning is to regulate land use of floodplains to restrict damage caused due to floods. The floodplain zoning, therefore, aims at determination of locations so that flood damages are reduced to minimum. A very restrictive activity can be allowed in that area. It is not only to protect the areas from damage resulting from floods and failure of water protective measures but is also useful in reducing the damage caused due to drain congestion, particularly in urban areas.*

26. In light of the contention raised by the applicant, the respondent has constituted a committee and called a report from the Expert from the Department of Civil Engineering, University Jodhpur and Professor and Head Dr. Suresh Kumar Singh submitted the report with facts that :-

"A Study indicates that Ayad River catchment is located in Udaipur district and for mean annual rainfall is 620.89 mm in catchment area and annual run off is 118.53 mm, which means runoff to rainfall ratio is only 0.17, (Study titled "Estimation of Runoff for Ayad River Catchment in Udaipur District Integrated Remote Sensing and Ggeographical Information System by Pratibha Katara, Deepesh Machiwal**, H.K. Mittal*, Yogita Dashora* and Arun D. Bhagat* of College of Technology and Engineering, MPUAT, Udaipur (Rajasthan) and Central Arid Zone Research Institute, Regional Research Station, Bhuj (Gujarat) was carried out from rainfall data of ten years (i.e. 2001 -2010)). Considering total mean annual rainfall as 620.89 mm and assuming upstream contributing catchment as 348.23 Km^2*

and 0.17 ratio of runoff to rain fall, the total mean annual run off will be 36.7 million cubic meters.

FatehSagar Lake system mainly comprises of:

a. *FatehSagar Lake*
b. *Badi Lake*
c. *BadaMadar Reservoir*
d. *Chhota Madar Reservoir*

Badi Lake is situated upstream of FatehSagar and its overflow enters in the FatehSagar Lake.

Similarly Pichola Lake System comprises of:

a. *Rangsagar Reservoir*
b. *Swaroop Sagar Reservoir*
c. *Kumaria Talab*
d. *Dudh Talai Reservoir*
e. *Nandeswar Reservoir*
f. *Pichola Lake*

Nandeshwer Reservoir is situated in the upstream of Pichola Lake and its overflow enters in the Pichola Lake.

It is important to note that the Capacity of Pichola lake is about 13.08 million cubic meter and FatehSagar lake is 2.1 millions cubic meters and are storing about 41.4 % total runoff. Because of the reduced contributing runoff (Change of land use pattern, change in drainage pattern etc. may be the causes) Lakes of Udaipur are having shortage of water.

The length of the Ayad river is about 26 km and out of which 11 km is through populated city area. Most of the runoff of the area is not directly joining the Aynd River. Initially runoff goes to lakes and spill water of lakes/reservoirs situated upstream of Ayad river or excess released water in case of heavy rains from lake /reservoir situated upstream of Ayad river is major source of discharge in Ayad river.

Local authorities (i.e., UIT Udaipur, RUIDP and Nagar Nigam, Udaipur) jointly worked and laid sewer line in most of the areas of Udaipur to stop the disposal of untreated sewage in to lakes and river. Various Sewage Treatment Plants were constructed by Hindustan Zinc Ltd in joint collaboration with Udaipur Smart City to treat the sewage within prescribed norms."

27. Ayad Smart Front Development and Rejuvenation Project was prepared and being undertaken by Udaipur Smart City Ltd by considering the recommendations of a technical committee of experts and following guidelines issued by "Town and Country Planning Organisation, Government of India, to ensure sustainability of rivers passing through cities and town.

28. The project report indicates that the rejuvenation project is conceived with the following main objectives-

1. Main Objectives

a. Protection of Slope Stability.
b. Protection of river bank erosion.
c. Safety of structures situated on the river banks.
d. Reducing chances of flash flooding.
e. Increase of ground water recharge.
f. Improvement of aesthetic appearance of riverfront within the city.

by considering:

i. Assessment of existing profile
ii. Water availability during lean period
iii. Likely flood conditions in river and safe passage through the city (flood of 50 year return period considered)
iv. Siltation Aspect
v. Environmental and ecological balance

2. Hydrological Studies:

By analysing the data available for hydrological studies, following conclusions may be drawn:

a) 50 year return period point rainfall: Hydrological frequency Analysis (by methods of moments) gives 50 year return period point rainfall value as 156 mm and applying clock- hour correction the values of 50 year return period point rainfall will be 179.40 mm.

b) Flood Routing : After analysis it was calculated that the flood values based on peak flood (50 years return period) for various locations which majorly contribute flooding in city area, are from :Routed Flood from Thur Dam and routed flood from Ghumania Nallah. The flood will be only because of spill discharge from Thur Dam and upstream side lakes.

c) Existing profile of river

S.N.	Chainage	Lowest bed level (m)	Left bank level (m)	Right bank Level (m)	Top width of river (m)	Remarks
1	0.0 km	610.09	624.00	6l 6.00	128.40	The top width of River is varying from about 144.0 m to about 30.0 m throughout the reach
2	2.0 km	602.39	605.00	604.90	75.72	
3	4.0 km	593.92	595.40	596.25	76.65	
4	6.0 km	586.63	590.71	591.41	109.34	
5	8.0km	582.26	584.72	585.12	56.23	
6	10.0 km	576.79	581.00	578.76	81.38	
7	12.0 km	572.49	574.78	574.94	50.94	
8	15.0 km	562.0	565.79	566.73	55.05	
9	18.0 km	552.56	557.85	555.50	50.0	
10	21.0 km	545.6	547.31	550.06	88.0	
11	24.0 km	540.89	542.64	541.61	30.00	
12	26.07 km	539.95	542.05	541.92	144.82	

d) Efficacy of Flooding in existing river in city area: Based on peak hood (50 years return period): The analysis was done to estimate the flooding of water which indicates that within the city flood water may spill on both river bank in case of 50 year return period. The top width of the river in the city area varies from about 50 m to 81 m and general lowest bed level varies from l in 280 m to l in 465 m with an average bed slope of l in350. The general minimum lowest bed slope is flatter where width is more which reflects that the within the city reach discharge carrying capacity is almost same. Hence increase of cross-sectional of river / increase of river capacity is required.

3. The major activities:

The major activities in this river rejuvenation project includes:

a. Cleaning of river Ayad: by removing the deposited waste material
b. Construction of a channel of 10.0 m outer width and 0.7 to 1.0 m clear water depth in the central portion of the river. This channel is having cement concrete side wall and dry-stone pitching in the middle part.
c. Slope Stabilization by Gabion pitching, protection walls, coir mats and grassing.
d. Walkway/service road
e. Stone pitching (30 m wide) and development of grass area (15 m wide) alternatively along the river Ayad as river is non- perennial river.

4. Impact of activities:

All the activities are proposed in the river are of non- permanent nature except side wall of channel and toe walls. These activities are not affecting the Catchment drainage pattern and not obstructing any inflow of storm water from river catchment.

a) Cleaning of river will increase the cross-sectional area of the river which will increase the carrying capacity of the river and this will reduce the chances of spilling of water from both bank in rainy season.

b) Construction of proposed channel bed mostly below natural bed of river will increase the cross-sectional area of the river which will increase the carrying capacity of the river and this will reduce the chances of spilling of water from both bank in rainy season as analysis indicated that flood water level will come down for 50 year return period.

c) The average 15 MLD treated waste water of less than 10 BOD after disinfection, will flow throughout the year except in case of flood period and as bottom of the channel is of dry stone pitching which will increase ground water recharge.

d) Gabion pitching/protection walls/dry stone pitching/coir matting will protect side slope and will provide protection against erosion of river bank. As the surface will become smooth and which will decrease friction losses so that the velocity of flow will increase. As velocity is increasing the discharging capacity will increase and will reduce the chances of flash flooding.

e) Stone pitching (30 m wide) and development of grass area (15 m wide) along the river Ayad will slightly decrease the ground water recharge due to increase of velocity in rainy season but at the same time increase of discharging capacity Will reduce the probable chances of flash flooding (if any). As the requirement of ground water table recharging is mainly in lean period, the slight decrease due to stone pitching will not affect much in recharge process.

5. Recommendations & Suggestions:

The Ayad river is flowing through the Udaipur city and about 11 km reach is within the city. The river has varying section and the top width of river is varying from about141.0 m to about 27.0 m throughout the reach. Analysis for Efficacy of Flooding in existing river in city area [Based on peak flood (50 years return period)] indicates flooding spilling on both banks. Hence to protect the city, it is necessary to increase the carrying capacity of river by increasing the depth of the river as width of the river cannot be increased. It is important here to clarify that increase of depth in total width of the river is to be avoided as it may lead to failure of foundation of buildings situated on the river banks.

Hence construction of a channel in the central portion of the river below natural bed where ever required as the level permits, in the river is a practical solution. The same channel will be used for disposal of treated sewage of the city of less than 10 BOD after disinfection. The activities proposed are with the aim to provide long term conservation and sustainable management solution for restoring the environmental and ecological balance of the river along with slope stability, prevention of erosion increasing ground water

recharge, safety against flooding of areas adjacent to river banks and ensure safety of human life and properties.

29. It is submitted by the respondent in light of the report of the expert committee by Department of Civil Engineering, University Jodhpur that the activities in the river is to protect site slop, minimize erosion, etc., without reducing the discharge carrying capacity, and not only in India but all over the World such activities are carried out by the administration in the river flowing within the city, and these activities are not creating any obstruction to flow and no work is proposed outside the river i.e. in the flood plain/catchment of the river. Hence, there is no violation of Section 24(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974.

30. It is intended to increase the underground recharge, minimize the erosion for sustainable management of the river within the city reach.

31. Main contention of the applicant is provisions of recharge of ground water and Executive Engineer of the Department has submitted that there is a provision to allow to recharge the ground water table. The current bed of the river was very uneven with many impressions of up to 4-5 mtrs. in which the water was stagnated and causing severe health hazards, pollution, bad smell.

32. The proposed level of bed/channel has been kept in such a way that no water will be stagnated. The bed level of the river has been kept to match the invert levels of all the structures resulting in no stagnation of the water and the water may smoothly flow by gravity. The top level of the channel walls are well below the high flood level and in case of the flood the water will flow over the channel and the stone flooring resulting in no obstruction to the flowing of water.

33. The contention of the applicant that the hydrodyanamic Model Study for 100 year return period flood analysis is required by independent institute of repute. On this point the matter was referred to the Professor of Civil

Engineering, University Jodhpur and 50 years return year was undertaken for consideration and on the basis of hydrological studies the conclusions are :

a. *"Hydrological frequency Analysis (by methods of moments) gives 50 year return period point rainfall value as 156 mm and applying clock- hour correction the values of 50 year return period point rainfall will be 179.40 mm.*

b. *Flood Routing : After analysis it was calculated that the flood values based on peak flood (50 years return period) for various locations which majorly contribute flooding in city area, are from :Routed Flood from Thur Dam and routed flood from Ghumania Nallah. The flood will be only because of spill discharge from Thur Dam and upstream side lakes."*

34. On the basis of above discussion and in light of the suggestions and specific recommendations of the project as suggested by Dr. Suresh Kumar Singh, Professor and Head of Department of Civil Engineering, MBM University Jodhpur, we direct the respondents to implement the following guidelines –

i. *In project, Reinforcement cement concrete (RCC) shall not be allowed except vertical walls of channel/toe walls along the direction of flow. As at some places RCC construction is proposed (where the soil is loose and the bearing capacity is low) to support stone pitching etc, this should be avoided and stabilization (increase of strength) is to done by providing dry stone boulders or other techniques etc. instead of providing RCC Slabs etc.*

ii. *Chlorination process is used for the disinfection of treated waste water of STP before discharging it to river, since practically it is very difficult to control dose of chlorine for complete disinfection and the excess residual chlorine in water may cause adverse effect to river ecology. Hence it is recommended to change the process of chlorination to ozonisation which is a very effective process of disinfection and same time it will increase dissolve oxygen in the treated waste water.*

iii. *Provision of gates is to be included in proposed anicuts end existing anicuts.*

iv. *Plantation on both side of river banks area (i.e., between sewer line and Bank boundary), by the respondents.*

v. *Restriction of multistorey building adjacent to river banks.*

vi. *Construction of central channel in the whole city reach of river (i.e., about 1 1.0 km length).*

vii. *The increase of depth near river banks is to be avoided as it may lead to failure of foundation of buildings situated on the river banks.*

35. With these observations and directions to the respondents the **Original Application No. 14/2023** stands **disposed of**.

Sheo Kumar Singh, JM

Dr. A Senthil Vel, EM

05th September, 2023
O.A No.14/2023(CZ)
PN