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Assessment Of Urban River Water Quality Indices In The Noyyal River Sub Basin, Tirupur, Tamilnadu, India.

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Abstract - Water quality monitoring can help researches to predict and learn the impacts for an ecosystem. Analyzing ,One of the most often used measures of theWater Quality Index (WQI) useful instruments for assessing water quality quickly and easily utilizing a variety of water parameters and shortened and mathematical predictors. Drinking andirrigation water have different qualities. A river serves as a source of both irrigation and drinking water. River waterquality is a major concern in terms of urban flow. River flowing in urban areas causes slow deterioration of system due to the encroachment and illegal activities by human. The practice of analyzing the water qualityusing WQI wasstarted from 1970's. Previously many methods and ideologies have been discussed by many researchers. Weight arithmeticmethod is the major method studied widely all over the world. The main focus of this review paper is to get a wide rangeof knowledge to assess the WQI using various techniques. Based on this review, the water quality of Noyyal River in Tiruppur city is planned to be identified. The river is divided and samples have been taken from 10 stations along thedownstream from starting station. The river has been divided, and samples have been taken at ten locations downstreamofpoints.

Keywords: Water Quality Index, Ground Water Quality, Noyyal River, Water Quality Monitoring

INTRODUCTION

Water quality in India's major rivers, lakes, and ponds has deteriorated significantly in recent years as aresult of considerable population growth and fasturbanisation and industrialization. In India, river cleaning tacticsare frequently under-prioritized, necessitating patio temporal monitoring of pollution levels in order to create efficient solutions for the reclaiming polluted urban water sources (Farhad et al., 2013; Abba et al., 2015). Waterquality measuring and observation in situ at specific points is laborious and duration-consuming (2012, Song et al.)Ganguly, Rana, and others (2020). The designof a mitigation measure to combat lake water contamination requires an evaluation of surface water, especially seasonal fluctuations, and the determination of pollutant sources.The measurement (WQI) is a rating scale that is regularly used for hydrological modelling. It is used to highlight theadequacy of water sources **.**Because Water on 71 percent of the area percent of the Earth's surface, it is known asthe "Blue Planet." Dinius et al., (1972) An attempt was made to construct a primitive social accounting system thatmight assess and implications of environmental manipulation techniques, and that index was applied to data fromvarious streams in Alabama, USA, as an example. It had a declining scale, similar to the Hortons index, with values stated as a percentage of excellent water quality equivalent to 100 percent.Lack of water isa significant universalissue. In 2025, it is anticipated that 1/4 of theinhabitants of the globe would are afflicted by a dehydration, with 2/3of the population experiencing water stress. By 2030, half a quarter of the global total be under severe there is a lackof water Freshwater impacting up to 31% of the inhabitants, with following closely behind, which are experiencingEstimated25%,7%, and2%ofthecommunity,correspondingly.

WATERALLOCATION ON THEGLOBE

TheGlobewaterisallocatedas

- 97.2percentoceanwater
- 2.15percentglaciersandotherice
- 0.61percentgroundwater
- Lakeswith fresh water:0.009%
- 0.008percentininlandseas
- Moistureinthesoil: 0.005%
- 0.001%oftheatmosphere
- Riversmakeup0.0001% ofthetotal.

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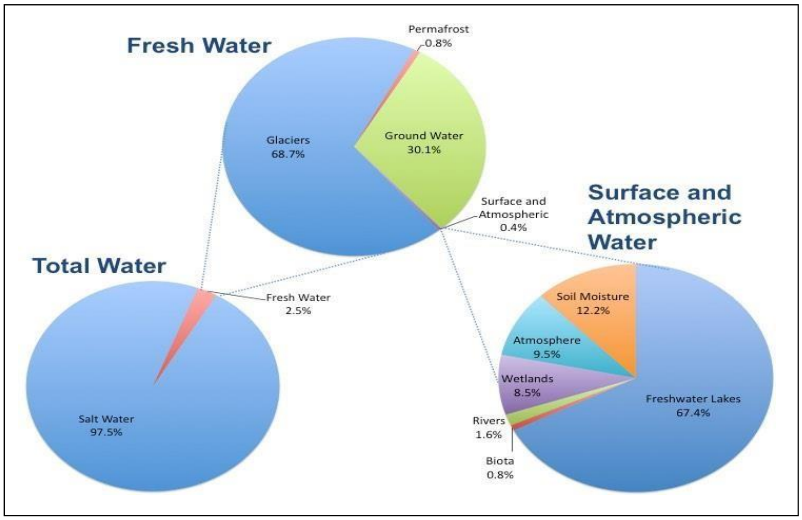


FIGURE.1.WORLDWATERDISTRIBUTION

WATERQUALITYINDEX

The Liquid Quantity Index (Water quality) is indeed a specific number that could be generated directly butusedtodeterminethegeneralqualityofabodyofwater.

IMPORTANCEOFWATERQUALITYINDEX

Parameter shows the ratio of aquantity to an independent or logical standard or a predetermined benchmark basis in general. As a result, The Indicator regularly reported weather parameters and changes usingstatistical techniques.The National Academy of Sciences (NAS) Planning Commission on Environmental Rankingspays close attention to environmental metrics. After reviewing relevant literature on the subject, the following six basic uses of WQI were identified. The Sampling points method is generally evaluate the total hydrology (physicochemical, microbiological, and quantitative features), and also the utilization off or avariety of applications.

METHODS AND SAMPLE DETAILS
STUDYAREA

Within Western Tamil Nadu, the Noyyal River basin of the Cauvery Stream. Eventually flowing into theCauvery Stream at Noyyal, a township in Karur district named only after stream, it passes through different townships and the municipalities of Coimbatore and Tirupur. It originates in TamilNadu's Vellingirihills, nearer the Kerala border, and passes over several townships and the municipalities of Coimbatore and Tirupur beforeflowing into the Kaveri River at Noyyal, a town in Karur district named well after river. With a surface capacity of3,500 kilometers2,the water's basins is180kilometres(110miles)wide and 25kilometres(16 miles)broad(1,400 sq mi).The farm production inthe watershedencompasses1,800 km2 (690 sq mi),witha population growth of 120 inhabitants per square kilometer (311/mi2) in the rural and 1000 inhabitants per km2 (2590/mi2) inthe cities was environmentally significant. A 173-kilometer(107-mile) tributary of the Kaveri River These interconnecting tanks are linked and majorly water surface associated the water bodies used in Noyyal River SubBasin.

METHODOLOGY

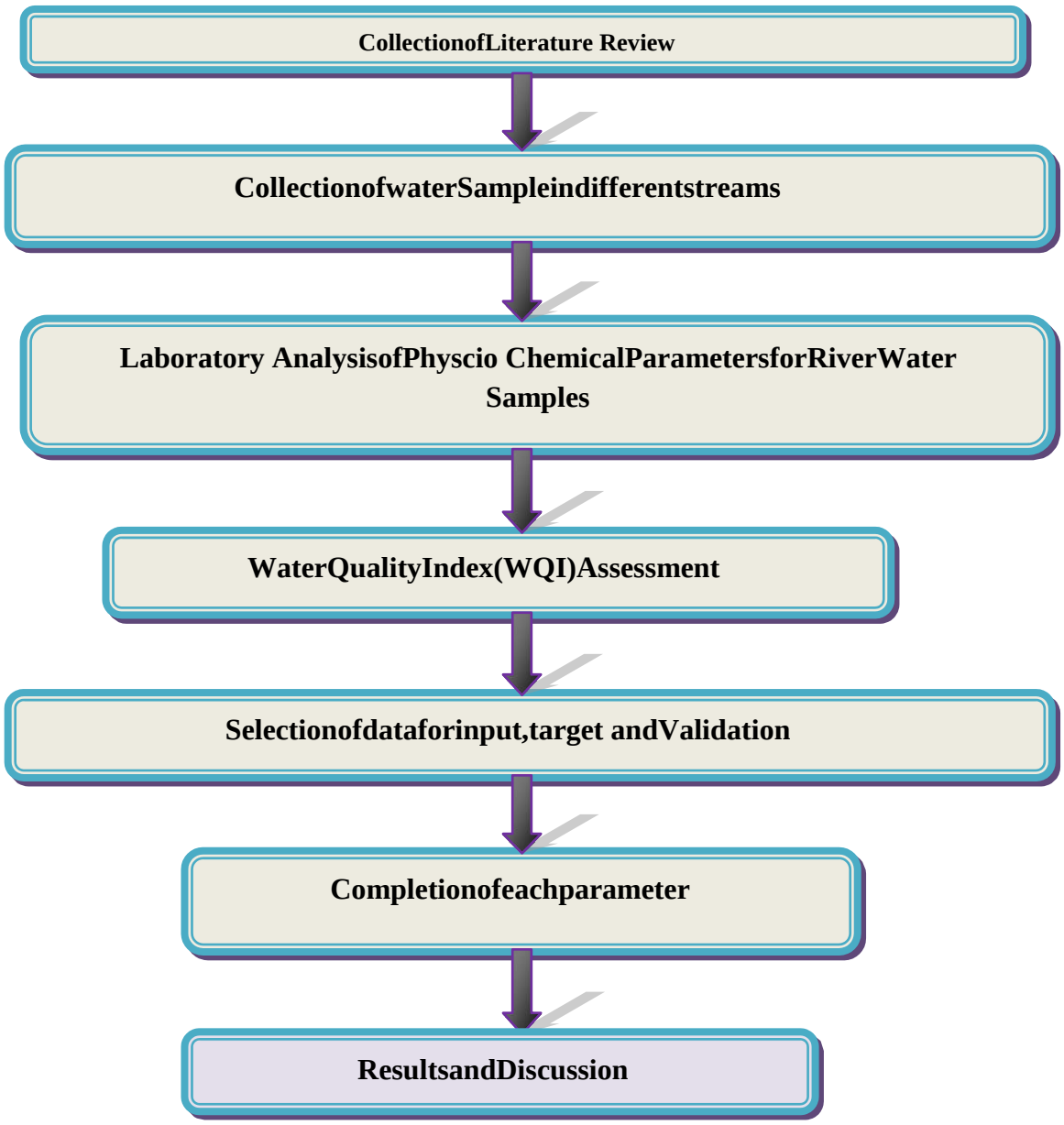


FIGURE.2.METHODOLOGYFLOWCHART

COLLECTIONOFSAMPLE

The samples are taken from various locations along the NOYYAL River and are subjected to basic parameter testing.. The photos of the gathered samples,as well as their locations,areshown.The Sample are collected from the Noyyal River Sub basin. Here the collection of waste like Industries of effluent discharge,Sanitary of sewage,House hold wastes and River water Run off Are deposited on the surface.

FIGURE.3.NOYYALRIVERFLOW

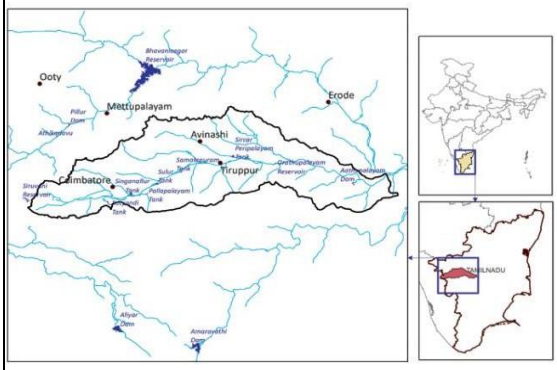


FIGURE.4.SCHEMATICMAPOFTHENOYYALBASIN

TABLE.1.DETAILOFSAMPLING

Sample Point	Location	CoOrdinates	
		Latitude	Longitude
1	Mangalam	11.106396	77.270809
2	Andipalayam	11.100613	77.327015
3	Avinashi–Mangalam	11.099791	77.313573
4	Royapuram	11.101649	77.330516
5	NatrajBridge	11.099004	77.345377
6	ValamBridge	11.105808	77.35311
7	RajivNagar	11.108228	77.359654
8	VenkateshwaraNagar	11.10889	77.361955
9	Maniyarampalayam	11.111045	77.367689
10	Kasipalayam	11.111044	77.371337

WATER QUALITY MONITORING

In the management, maintenance, and treatment of water bodies, determining the quality of the water iscritical(Meietal.,2011)..DO and pH,COD,BOD. The Water Quality Management manly concentrate theCharacteristics of TDS, TS, Cl, F,SO_4,CA, Mg, Na, HCO_3 are responsible for the Water Quality Indices for the predictions of the water surface. This Study Deals with the aspects of the WQI standards on the purpose of Drinking and Irrigation water local bodies. Based on the standards the water Quality will be represents on the river basin. With the help of the systematic sketch of the NOYYAL RIVER SUB BASIN the co ordinates mark out the station points. The main focus of thispaper is to get a wide range of knowledge to assess the WQI using varioustechniques.

Majority of the water Quality index were identified by the Classification of USSL, Donnen's, Wilcox. Hence they are implemented on the collection of samples.

WATER QUALITY STANDARDS

TABLE.2: water inspection procedures for drinking water

S.No.	Category of Qualities	Contaminant Type	Acceptable Quality
1	Physical	Turbidity	5
		Colour	5
		Taste&Odour	1
2	Chemical	pHValue	7– 8.5
		Hardness	75mg/l
		TotalSolids	500mg/l
		Magnesium& Sodium	500mg/l
		Chlorides	200mg/l
		Sulphates	200mg/l
		Calcium	75mg/l
		Zinc	5mg/l
		Copper	1mg/l
		Iron	0.3mg/l
		Maganese	0.1mg/l
		Arsenic	Nil
		Lead	Nil
		Selenium	Nil
		Chromium	Nil
		Cynide	Nil
		Fluroide	0.5mg/l
		Cadmium	Nil
3	cal and Micro –organic		Coliformbacteria

TABLE.3.water inspection procedures for irrigation water

S.NO	Contaminant type	Acceptable Quantity
1	Sodium	NoGuideline
2	Chloride	NoGuideline
3	Nitrate	NoGuideline
4	Boron	2.00mgll
5	Copper	0.20mg/l
6	Lead	5.20mg/l
7	Zinc	2.00mg/l
8	Chromium	1.00mg/l
9	Cadmium	0.01mg/l

WATER QUALITY MODEL

The accompanying approach was used to determine the hydrology(WQI).

WQI=antilog Σ^{n} i=1$W_i$log$_{10}q_i$ Where W_i is the weight age for each parameter. It is calculated as

$$W=K/S$$

K is the proportionality constant, S_i is the standard value on BIS/ICMR. K is calculated as

$$K= 1/ \sum^{n}_{i=1}(1/S_i)$$

The grading indicates value, q_i was estimated simply

$$q_i=100*\{(V_{actual}–V_{ideal})/(V_{standard}–V_{ideal})\}$$

RESULTS

INDICES OF HYDROLOGY

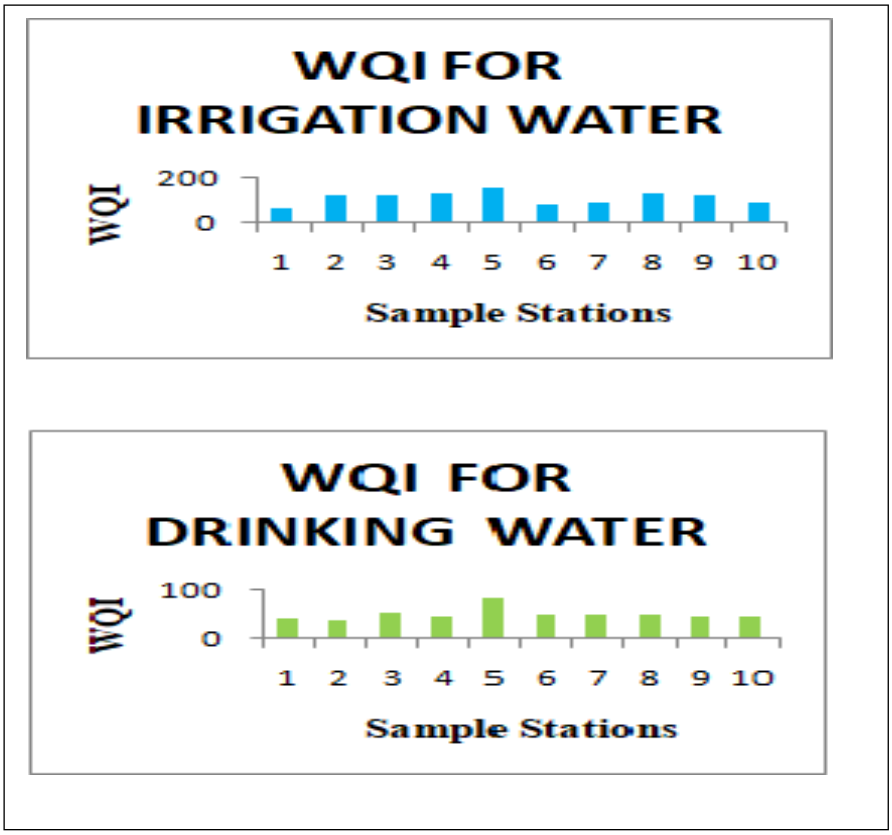
TABLE.4. Comparison b/w water quality index for drinking water and irrigation water

Sl.No.	WATER QUALITY INDEX	
	Drinking Water	**IrrigationWater**
1	39	60
2	38	116
3	51	123
4	43	128
5	83	153
6	46	80
7	48	84
8	49	129
9	46	119
10	43	86

The Water Quality Indices for the Drinking and Irrigation Water shows the graphical representations of the above following Data with respect to the location of 10 station points

The measurement (WQI) is a rating scale that is regularly used for hydrological modelling. It is used to highlight the adequacy of water sources

The Water Quality Index comparison chart between Drinking Water and Irrigation Water is the mainconstituentsinthispaper.



.**FIGURE.5.**WATER QUALITY INDEX COMPARISON CHART BETWEEN DRINKING WATER AND IRRIGATIONWATER

CONCLUSION

All these drinking and irrigation water are subjected to the assessment of water quality. The hydrology of the Noyyal River was determined to be unfit for drinking purposes based onnumerous indicators studied in this inquiry. WQI can be used to determine the health of a river

The contamination of the Noyyal stream was mostly caused by the discharge of home and industrial waste water, as well as other anthropogenic activities. As a result, regular water quality monitoring is the water quality index is put to the test for both drinking and irrigation water, with the findings being recorded. When comparing irrigation water to drinking water, the results demonstrate that irrigation water has higher parametervalues.

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