

**Research Article**

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## **Anthropogenic Interventions and Consequences in Manjra River: Empirical Observations near Village Dighol, Ahmednagar District, Maharashtra, India**

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### **Abstract**

The River is an integral part of human civilization and prime source for fresh water. Perennial flowing rivers complement the environment, ecosystem, agriculture and many more economic activities. Many living things, including humans, get protection and life energy from the river. Rivers provide habitat, food, water, life and energy to many living beings, including humans. However, the condition of rivers in our country is worrisome. The 351 stretches of river in India are highly polluted and identified for river restoration. The effect of anthroposphere on the environment in general and river ecosystem in particular is being felt with intensity. Its main citations are river water pollution, floods, alteration in channel morphology, sand mining, and construction of wells in river streams and on river banks and deterioration of riparian vegetation etc. Empirical observation based study during field visit and satellite data, hydro-climatological data and interviews with local people present study has been carried out. Open source tools for mapping and data analysis have been used to infer towards solution. During field visit of stretches of River Manjra (near Dighol village), tributary of Godavari River has been observed that, illegal excavation of sand, sand of river replaced by soil, fine sediment which results in to growth of bars (mid-channel bars, point bars) and subsequently vegetation within the channel has been grown. The cumulative effect of all these is the lowering depth of channel and flood issue has increased along stretches. The flood affected area is increasing even though the rainfall and water discharge has not changed much. Present attempt is taken to study and listed anthropogenic intervention in Manjra River stretches near village Dighol Tal. Jamkhed Dist. Ahmednagar Maharashtra. The scientific deepening of river channel, riparian vegetation, and cleaning of river channel and controlling illegal

### **Keywords**

Anthroposphere,  
River ecosystem,  
Flood,  
Manjra River,  
open source,  
water security.

practices help to minimize the flood risk and increased ground water level and food security for wellbeing of people. The scientific treatments and people participation would be play crucial role in the restoration and conservation of river stretches of Manjra River.

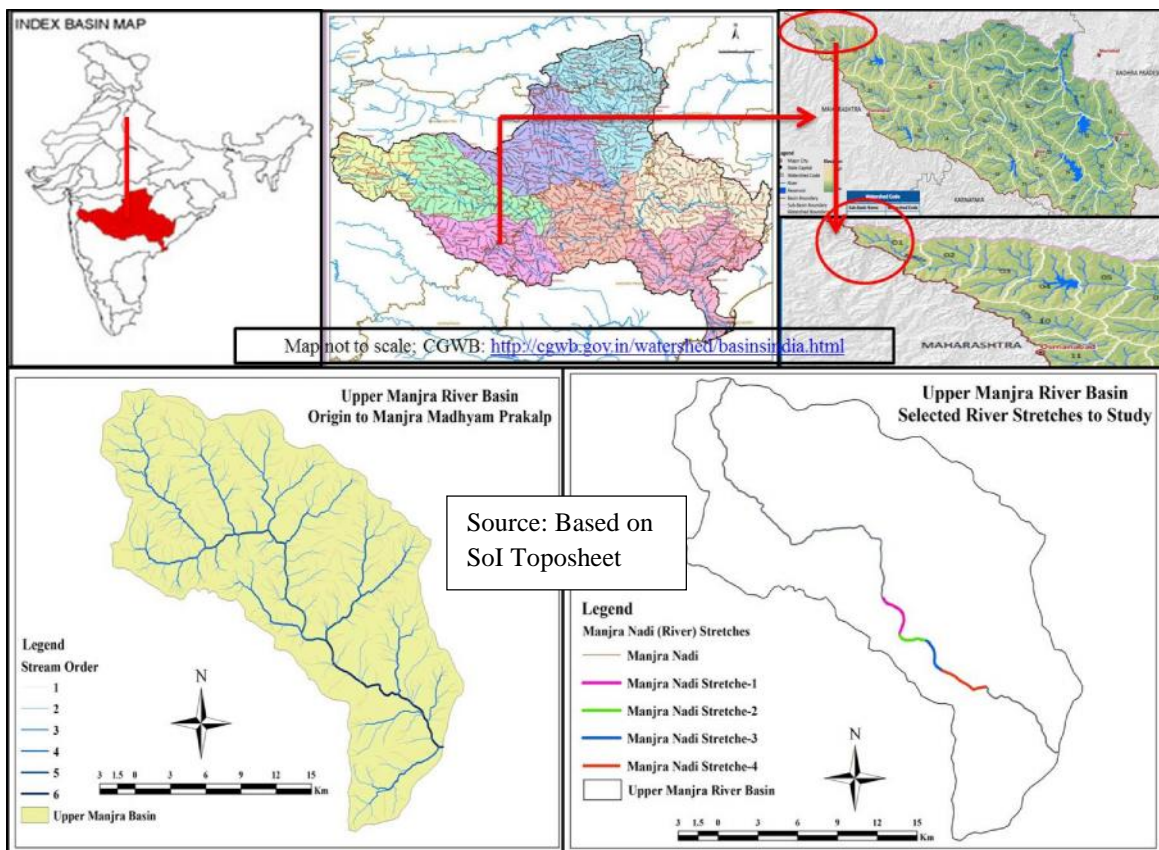
## Introduction

In the time-space conceptual framework of geographical study, human interventions are missing which become active agents in changing in river system and recent research shows that humans are substantially affecting river systems at various scales (Rhoads 2020). Human's interventions are possible in watershed, sub basin, basin scale and in and along the river channels. Human alter the river directly and indirectly. Direct interventions are considerable and more dangerous includes artificial river channel deepening, sand mining, illegal well digging, encroachments, hydraulic structure, thinning of riparian vegetation etc. River system responds to direct human intervention is matter of study. Basic understanding of human interventions and river dynamics could be play pivotal role in river

restoration and management. It has been observed and acquainted in study that unanticipated and undesired consequences of human interventions on river system in last few decades.

## Study Area:

The origin of river Manjra is in Balaghat range near Patoda tehsil of Beed district of Maharashtra having tributaries i.e.Girni, Manar, Lendi, Terna and Tawarja (Pathani 2010). The origin of river at 823m, total length is 724 and catchment is 30844sq.km (MPCB & Aavanira 2015). It flows through Maharashtra, Karnataka and Telangana (Wikipedia 2022). The watershed as study area of Manjra River has considered till Dam near village Iet, tehsil Bhum, Osmanabad. Out of total length, 11.3km channel with four (4) stretches selected for study and details are given in Table-1.



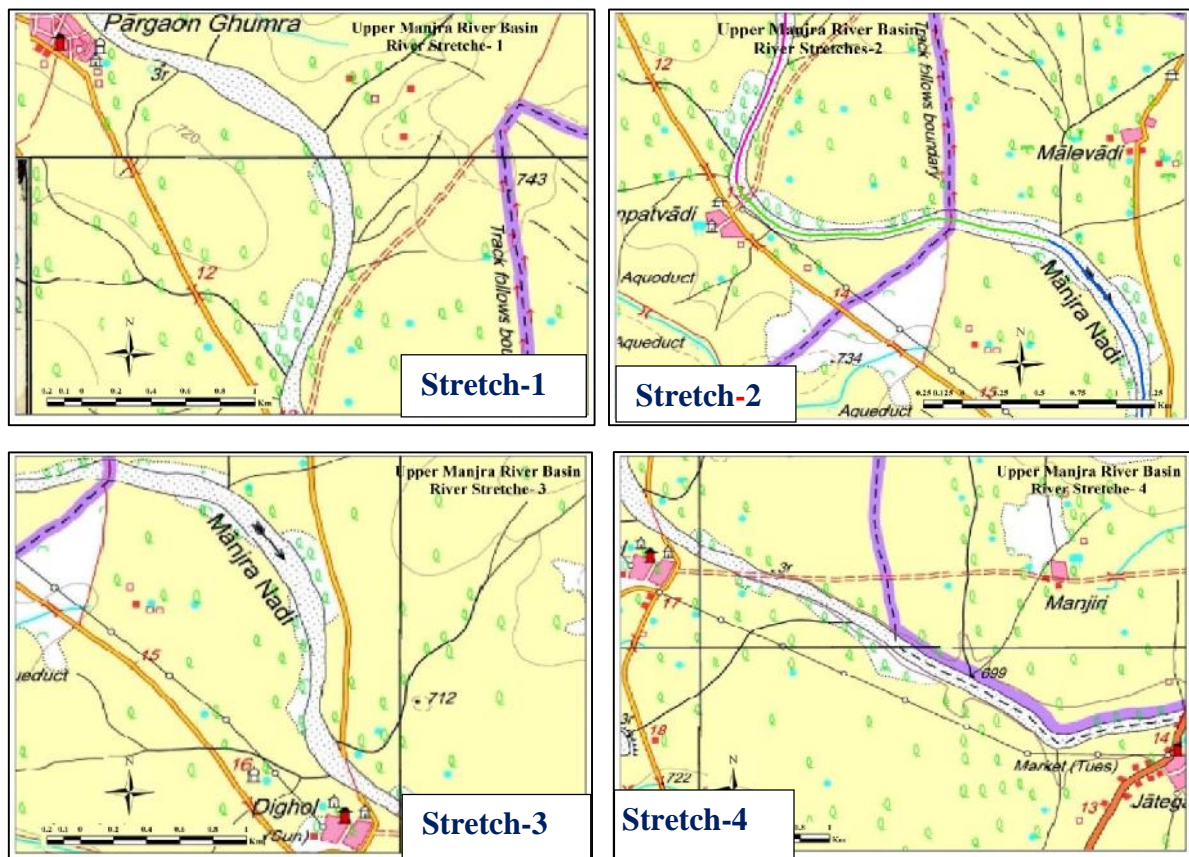
**Map.1** Location and River Stretches map of Manjra River as Study area

Stretches	Location & Extension	Length	Identity
Manjra River Stretch - 1	75.502225E 18.759595N 75.513544E 18.736415N	3.4 km	PargaonGhumra to Anpatvadi
Manjra River Stretch - 2	75.513544E 18.736415N 75.531712E 18.732735N	2.0 km	Anpatwadi to Malewadi Nala Confluence
Manjra River Stretch - 3	75.531712E 18.732735N 75.541853E 18.714586N	2.2 km	Malewadi Nala Confluence to Dighol
Manjra River Stretch - 4	75.541853E 18.714586N 75.572519E 18.703704N	3.7 km	Dighol to Jategaon
<b>Total Length</b>		<b>11.3 km</b>	

**Table.1** Detail information of Manjra River Stretches

The four stretches with length of 11.3km (from Pargaon village to Jategaon Villag) having Stretch-1 to Stretch-4 are empirically assessed towards acquainting anthropogenic interventions. Various human activities are gradually

deteriorating river ecosystem. Following anthropogenic interventions have been identified during field observation and based on empirical approach.

**Map.2:** Location of Manjra river stretches-1 to 4 (Source: Sol Toposheet)



### Anthropogenic Interventions in Manjra River Stretches:

**1. Water Pollution:** Both point and non-point source of pollution has been observed near the settlements and dominate agricultural area respectively. Along the river stretches four villages are located and total domestic waste water discharge in the river. This area receive good amount of rainfall in monsoon season and underground water along river is optimum hence two crops are in practices with vegetable mean vile. Farmers of area are dumping lots of chemical

fertilizer in soil since few decades which is non-point source of pollution.

**2. Bank Erosion:** The measurement of river bank erosion and lateral channel change (Lawler 1993) is becoming serious problem of study as human interventions have been increased. All four stretches are witnessed evidences of bank erosion during flood since 2016 (Photo.1). Instability of bank has been increased because illegal practices such as sand mining, well digging, less vegetation, impulsive discharge in monsoon.



**Photo.1** Bank erosion during 2016 Flood near Dighol village in Stretch-3.

**3. Encroachment &Erosion in Agricultural Land:** Due to encroachment of channel, siltation, less riparian zone and flash flood during monsoon make inundation of agricultural field and

introduced erosion of fertile soil. It is loss of local farmer because losses of soil lead declining in agriculture production (Photo.2).



**Photo.2** Agricultural field erosion

**4. Illegal Sand mining:** In the decade of 1981 to 1990 all stretches under study were full of pure sand. As per Government policy on the sand excavation they introduced sand auction which introduced exploitation of sand and illegal practices. All four stretches have been completely

exploited and today now sand in channel at all. It has been influenced on the underground water level in area (Photo.3).



**Photo. 3** Theft of sand and illegal practice in river channel to exploit Sand

**5. Degradation:** It means lowering of channel bed may occur as a result of structural or climatic changes in association to topography, vegetation and lithology (Leopold, Wolman and Miller 1995), is true to Manjra river stretches but anthropogenic intervention is more dominant than

natural interventions in deepening of river bed. Sand excavations, nonscientific deepening with machines are major human intervention in the degradation of channel bed (Photo 4).



**Plate .4** Degradation of river Manjra

**6. Thinning of riparian vegetation:** Most of the river stretches bank nearby area is open without vegetation i.e. riparian zone which protect bank and play crucial role to sustain river ecosystem.

But it has been observed that farmers and theft have been cleaned vegetation. Few patches of vegetation are available. Trees have been cut for agricultural practices.



**Plate. 5** Google image of structures

**7. Artificial structure:** There are 11 engineering structures, out of them three are bridges and eight are KT weir. Recently constructed KT weirs are political motivated, hence sites are not appropriate and scientific, hence it increase instability of bank and change in bade morphology of channel.

**8. Wells Digging:** The total 92 wells have been observed along and in the chenille. The well distribution in stretches as 37 wells in stretch-1, 07 in stretch-2, 17 in stretch-3 and 31 in strctch-4 respectively.



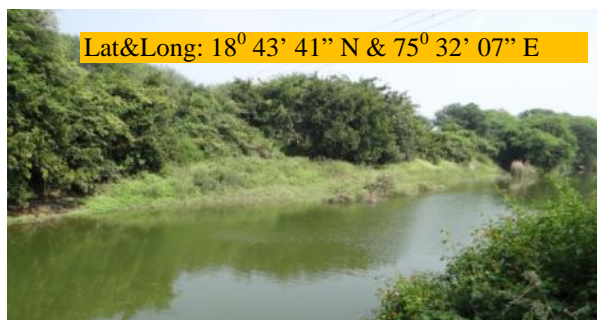
**Photo 6.** Left bank well & dumped material



**Photo 7.** Right Bank well & dumped material

**9. Eutrophication:** Eutrophication is belongs to excessive plant and algal growth due to one or more limiting growth factors needed for photosynthesis (Chislock, et al. 2013) and human intervention through point and non-point source of pollution accelerating rate of Eutrophication or river. In the study area, river stretches 1 to 4 very few sites have been identified having problem of Eutrophication due to domestic west and agricultural runoff.

**10. Channel Bars:** As naturally due to degradation and aggradation bars are developed in channel, at few places due to west dumping bars have been developed. But most of bars are developed due to human intervention such as well digging, sand mining and siltation (Photo 8).



**Photo 8.** Channel Bars in the river Manjra in Stretch-3.



**11. Vegetation in river channel:** Sand replace by soil and silt, leads change in bade morphology and developed bars, subsequently vegetation growth has been introduced in last two decades (Photo 9).



**Photo.9** Vegetation in channel bade on the bars developed in last 30 years

Vegetation growth is very serious issue in study area because it increases the flood condition though discharge is less. Inundation of surrounding area has been increased since last few years. It also becoming cause to instability of river bank and leads bank erosion (Photo-8).

### Suggestions

Sincere field visit with instruments such as dumpy level, GPS and photo camera has been done to make some crucial points about river stretches towards conservation. Following observations have been concise 1) Water pollution is not major issue; 2) River bank erosion is a major problem along all stretches; 3) Encroachment of river bank area by farmer leading farmland erosion; 4) Illegal sand mining has done intensively hence no sand is found in channel; 5) Degradation of all stretches is critical at certain sites where excavation of sand later on deposited soil has done; 6) Thinning of riparian vegetation, artificial structure, wells digging, eutrophication, channel bars, vegetation in river channel are the another major issues are observed.

The scientific deepening of river channel, increase riparian vegetation, cleaning of river channel, controlling illegal practices such as sand mining and well digging, minimize the flood risk. River restoration treatments are suggested to conserve the river stretches towards water and food security for wellbeing of people in four villages.

Most important people participation at various levels is an ultimate solution to restore the river stretches of Manjra River for sustainability of river Manjra near Dighol village.

### References

- Chislock, Michael F, Enrique Doster , Rachel A Zitomer, and Alan E Wilson . "Eutrophication: Causes, Consequences, and Controls in Aquatic Ecosystems." Nature Education Knowledge, 2013: 10.
- Lawler, D M. "The Measurement of River Bank Erosion and Lateral Channel Change: A Review." Earth Surface Processes and Landforms, 1993: 777-821.
- Leopold, Luna B, M Gordon Wolman, and John P Miller. Fluvial Processes in Geomorphology. New York: Dover Publications, Inc, 1995.
- MPCB & Aavanira. Comprehensive Study of Polluted River Stretches and Preparation of Action plan of River Godavari from Nashik D/S to Paithan. Gov., Nashik: MPCB, 2015.
- Pathani, Ravindra Anant. The Study of Quaternary Geology of Godavari and Manjra River Basin of Nanded District, Maharashtra. PhD Thesis, Nanded: Unpublished, 2010.

Rhoads, Bruce L. River Dynamics-  
Geomorphology to Support Management.  
New York: Cambridge University Press,  
2020.

Wikipedia. Manjira River. 2021.  
[https://en.wikipedia.org/wiki/Manjira\\_Riv](https://en.wikipedia.org/wiki/Manjira_River)  
er (accessed 2021).

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