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Analysis of Geo-environmental effects due to human interventions along Pravara River at Sangamner city, Ahmednagar, Maharashtra

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ABSTRACT

Water resource is most essential basic resource for human being. Today water resource management become an important issue for all developing countries but rapid growth of population and its repetitive activities along river pose a concerned impact on river system. The water quality and quantity is under constant pressure by presence of human interventions. These all problems are largely concentrated in and around urban area. Keeping this view in account Sangamner city has been selected for analysis Geo-environmental effects of human interventions along Pravara River. Field observations reveals that human activities depends in and along river like construction of dams, diversion of channel, removal of vegetation, domestic and religious activities, sand mining and brick making resulted degradation of water quality, changes in the channel morphology and adverse environmental impacts. To analyse that Geo-environmental impacts is the main aim of the research with remedial measures for mitigate the interventions and consequences in future.

KEYWORDS- Human interventions, Pravara River, Geo-environmental effects, channel morphology,

Introduction-

Rivers are the most important life supporting systems of the nature. (Sreebha S., 2013). River water is a basic natural resource for human beings. Rivers are important carriers of water and nutrients. Rivers also provides its valuable deposits like sand to the respected area. For centuries human have been enjoying the natural benefits provided by the rivers (Naiman, 1992). Man has changed the nature of many world's rivers by his inappropriate interventions. According to the report of WHO (2015), in the world out of biggest rivers 227 are the interrupted stream due to dams and other infrastructures. Many human activities like sand excavation, construction of bridges, vegetation destruction, diversion of channel, brick making, agricultural have been deteriorated the water resource. These all problems are largely concentrated in and around urban area. Water issue are becoming very severe in India. Maharashtra is the second largest state in India according to population and having large numbers of cities and towns. In Maharashtra majority of population depends on agriculture and irrigation is essential for enhance agriculture productivity. CPCB (2016), reported that Maharashtra had 49 polluted river stretches due to human activities. Taking this view in account Pravara river in Sangamner city has been selected for further research. Pravara river is

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an important drainage pattern of Sangamner city in Ahmednagar district. Many important town and cities are located on the bank of Pravara river. River Pravara prove as a boon of city for drinking, irrigation and industrial and tourism purpose. Many human activities along river badly affects on quality of the water as well as Geo-environmental effects in the area. To understand inappropriate human interventions is the main objective of the paper. Furture research will helpful to minimize such interventions in future.

Study Area-

For further study Pravara river in Sangamner city has been selected. Pravara river is an important drainage pattern of Ahmednagar district. The northern part of district is drained by Pravara. The river Pravara rises at an elevation of 1080 meters near Ratanvadi village in Akole Tehsil. The total length of river is near about 230 Km. Sangamner is the one of the developed cities in the district which located about 58 km. downstream from the origin of Pravara River. It is on the confluence (*sangam*) of river Pravara, Mahlungi and river Nataki that's why city got its name Sangamner. Sangamner is located at 19°57' north and 72° 22' east. Sangamner has an average elevation of 549 meters from mean sea level. Sangamner is the second largest city in Ahmednagar district by population. After 1967 establishment of co-operative sugar mill at Sangamner, the agriculture in the area has witnessed rapid changes. Sugarcane has become dominant commercial crop in the area. River Pravara is a major irrigation source for the agriculture.

Objectives

1. To study Morphological characteristics of river pravara.
2. To identify types of human interventions along pravara river at Sangamner city.
3. To analyse Geo-environmental effects along pravara river at Sangamner city.
4. To suggest the appropriate remedies to control sustainable Geo-environmental changes along river pravara.

Methodology-

Sangamner city is situated on the northern bank of Pravara River and small town situated on the south bank is known as Sangamner khurd. For the investigation 2 sites of Pravara River in the city was selected referred as S1 and S2 (Table No.1) which covers 1.5 km. distance and approximately 58 km. downstream from the origin of the river. Pre-field observations has been done through toposheets of the respected area (No.47 I/2) and Satellite image of the respected area. During field visit detail observation of the area & interaction with local people has been conducted. For water quality analysis water samples were collected from the surface water along river. Temperature of samples were measures at in the field during collection. The water samples were analyzed at Water Quality Laboratory level- II, Nashik under Hydrology Project, Water resources department, Government of Maharashtra. The analysis was carried out in the laboratory as per APHA standard methods. Various Physio-chemical parameters like pH,Electrical conductivity(EC),Total dissolved solids



(TDS), Dissolved oxygen (DO), Biological Oxygen demand (B.O.D.), Chemical oxygen demand (C.O.D.), Total Hardness and calcium were analyzed for the evaluate the impact of human interventions on water quality. It all information summarize and analysed.

Table No.1- Sampling Stations

Sr. No.	Site	Area	Distance From origin (In Km.)
1	S□	Kasara Dumala	58 km.
2	S□	Highway bridge (on the confluence of Pravara and Mahlungi)	59.5 km

Results and Discussion-

Pravara River is an important drainage pattern in Sangamaner city. City lies rain shadow zone so river Pravara prove as a boon for drinking, irrigation, industrial and tourism purpose. After construction of Bhandardara dam area has been brought under economic change. The area is become prosperous belt of sugarcane industries. Rapid economic development rising repetitive human interventions in and along river that results changes in the channel.

➤ **Water Quality Assessment-**

Water has the unique property of dissolving and carrying in suspension a huge variety of chemicals, has the undesirable consequence that water can easily become contaminated (Ghorade, Ishwar B., 2014). Due to urban and industrial growth at Sangamner city affects on water quality and it stress on the self-purification mechanism of the river. Water Quality Index (WQI) of both station shows that there is considerable variation physio-chemical characteristics. (Table No.2) Results of the study exhibits that according to nature of human interventions water quality became irrevocable. Results reveals that S2 is the confluence of Pravara and Mahlungi River and supposed suitable place for domestic activities, Rituals and Vehicle and cattle washing it implies the quality of water is under constant pressure as compare S1

Table No.2-Water Quality Index values

Sr.No.	Parameters	Station-1(S1)	Station-2(S2)
1	Temperature	23°	22°
2	pH	6.9	6.5
3	Electrical conductivity	141	156
4	Chemical Oxygen Demand	20	20
5	Biological Oxygen Demand	5	6
6	Total Dissolved Solids	90	100
7	Total Hardness	35.9	46.2
8	Calcium	7.17	7.98



Water Sample Stations

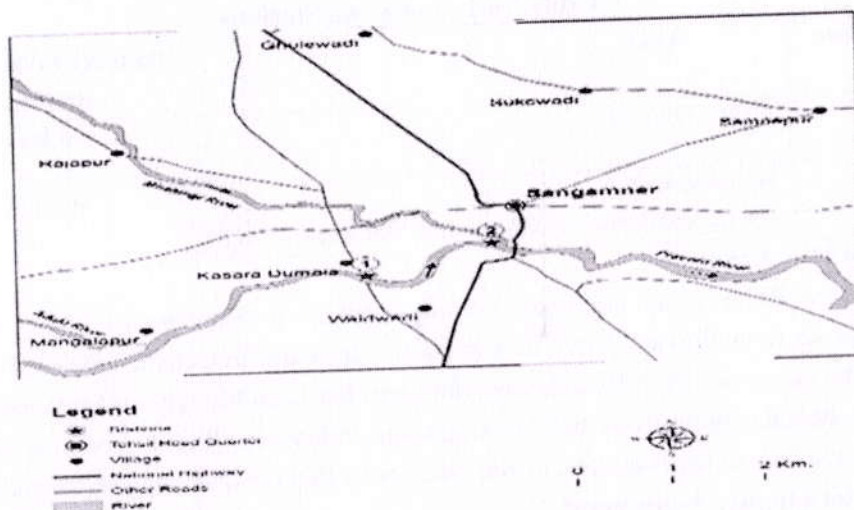
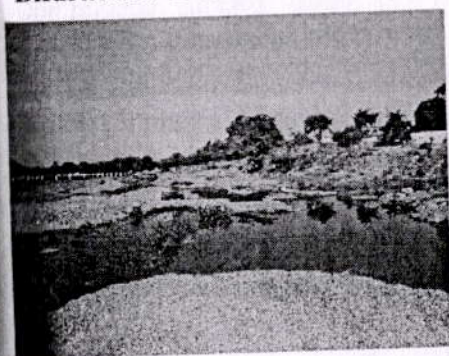


Fig. no.1

Bifurcation of channel-



With expansion of city is increasing demand of building material like sand and gravels as well as brick. Sand and Brick are essential material for construction. River is a major source of sand and gravel. At the S1 Brick making activities develop along river from few years it effects on river channel. Unscientific in-channel and near channel sand mining affects on river, all material dumped in the channel that responsible to bifurcate the channel.

➤ Environmental Effects-



➤ According to discussion with brick maker at S1 they are produces 5000 bricks daily. With expansion of city the production lead increase. It emits heavy amount of smoke and large amount of air pollution. It affects on brick workers and local residents.



➤ Health Impacts



City garbage and solid wastes dumps at the S2 that leads health problems like Cardiovascular. The workers of brick making industries and nearby residents suffering from respiratory problems. At the S1 the entire sewage of city has been let in the channel as well as it encroached by urban slums it causing unhygienic atmosphere and creating health problem like malaria, Diarrhoea. The period

without the rotation of water increase defecate in the stream poses an extreme human health risk.

➤ Water logging

City is concentration of urban sprawl, production, transportation and immigrants that implies an increasing demand of water resource for drinking, irrigation, construction, domestic and industrial activities. With expansion of city is increasing demand of building material like sand and gravels as well as brick. Sand and Brick are essential material for construction. River is a major source of sand and gravel. Sand mining and Brick making activities develop along river from few years it implies dumps the material in and along the active channel. Rapid urbanization has created high density of population, large amount of solid wastes, discharge of domestic waste water and sewages. (Das D.N., 2013). Garbage waste is a major load on the cities and rivers are the best suitable place to dump it. (Unde Maya, 2008). It creates instream water logging

Table No.3- Sampling stations and Human Interventions

Sr.	Station	Site	Distance (From origin)	Human Interventions
1	S□	Kasara Dumala	58 km.	Indiscriminate water withdrawal, Brickmaking, Encroachment, Construction.
2	S□	Highway bridge (on the confluence of Pravara and Mahlungi)	59.5 km	Domestic activities, Dump of urban waste, Vehicle and cattle washing, Rituals, Encroachment, Construction

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Conclusion-

Field observations revealed S2 is more affected due to domestic activities and instream construction. S1 is a concentration of brick making activities that it worsen the environmental condition and degrade the social status, so the dumping of solid waste garbage along channel should be prohibited. Many other human activities along river like construction of dams, diversion of channel, removal of vegetation, Instream agriculture, religious activities, sand mining pose a concerned impacts on river and Geo-environmental condition of the region, so government should put a complete ban on such activities. Study would be useful for creating awareness among local peoples, farmers and miners that may prevents further degradation of water resource.

References-

1. Bharati Radhakant (2004), 'Rivers of India', National Book Trust, India, New Delhi.
2. Biksham G.(1979), Dissolved transports during low discharge in Godavari River Basin.' Hydrological aspects of draughts, 221-227
3. Buffington John M. (2012), 'Changes in channel morphology over Human time scale.' Gravel Bed River/435-462
4. Chatterji Rupali (2012), Geography of India, Global Academic Publishers and Distributors, New Delhi.
5. Chauhan Surender Singh (2010), 'Mining, Development and Environment: A case study of Bilalia mining Area in Rajasthan, India' Human Ecology/31/1-65-72
6. Collins, B. and Dunne, T. (1990), 'Fluvial Geomorphology and River gravel mining : A guide for planner', Case studies included Special publication 98, California Department of conservation, Division of Mines and Geology.
7. Deshmukh K.K.(2012), ' Evolution of groundwater pollution of Sangamner area, Ahmednagar district, Maharashtra, India', Journal of Environmental research and Development, Vol.-07, No.01.
8. Fuyane B.F., Athlhopeng J.R., Mulale K.(2013)- 'Impact analysis of informal Brick production on the Environment: Gaborone Dam Area, Botswana', International Journal of Scientific and technology Research, vol.-2/9-73-78
9. Ghorade I.B. (2013), Eco sustainability assessment of Godavari River water sustainable utilization', Ph.D. Thesis, BAMU, Aurangabad.
10. Govorushko S.M. (2010), 'Effect of Human activity on Rivers' International Congress on River Basin Management-464-476
11. Gupta, Lallan Prasad (1996), Nature of organic matter in the sediments of Godavari River basin', Ph.D. Thesis, JNU.
12. Joshi Veena U., NagareVikas B. (2013), ' Badland formation along Pravara river, Western Deccan, India.', Zeitschrift for Geomorphologie.

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13. Kale Vishwas, Gupta Avijit (2010), Introduction to Geomorphology, Universities press (India) Private limited 2010.
14. Kondolf G.M. (1994), 'Geomorphic and Environmental effects of instream gravel mining' Landuse and Urban planning / 20-225-23
15. Padmalal D. K. Maya, S. Streebha and R.Sreeja (2008)- 'Environmental effects of river sand mining: A case from the River catchments of Vembanad lake, Southwest of India'. Environmental Geology/54-879-889.
16. Sapkale Jagdish (2014), 'Human interferences and variations in sinuosity Index of Tarali channel, Maharashtra, India', Paripex, Vol.3/5-36-37
17. Sapkale Jagdish (2014), 'Impact of silt excavation on River morphology and bed material study of Tarali channel, Maharashtra, India', IRJES/3-36-37
18. Sapkale Jagdish (2014), 'Channel Disturbance and variation in Channel cross sections of Tarali channel, Maharashtra: Using advanced surveying techniques and Transit Theodolite', IJETAE/Vol.4/455-462
19. Saviour Naveen M. (2012), 'Environmental Impact of soil and sand
20. mining: A review', Environment and Technology/vol.1/3-125-134
21. Unde Maya G.(2008), 'Geo-environmental effects of urbanization in the river channel-A case study of River Sina around Ahmednagar city.', Enrich environmental multi disciplinary International Research Journal, Issue 03, Vol.-01, No.-03.

