

## EXPLORATION FOR ECO REFORMS STRATEGIES AND MANAGEMENT OF URBAN LANDSCAPE OF JAUNPUR CITY

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### ABSTRACT

Jaunpur is an ancient city situated on the bank of River Gomati which bisects the city of Jaunpur in the north and south directions. The paper deals with physico-chemical properties of water of Gomati river and a religious Chaukia pond (temperature 24.0 & 22.9 oC, pH 8.3 & 7.9, transparency 18.6 & 20.7 cm, electrical conductance 450 & 380  $\mu\text{s cm}^{-1}$ , total solids 364 & 325 mg L<sup>-1</sup>, COD 135.43 & 97.9 mg L<sup>-1</sup>, BOD 96.70 & 45.40 mg L<sup>-1</sup>, DO 4.50 & 5.31 mg L<sup>-1</sup>) respectively in the municipal area. The water bodies including underground water, low lying areas, water drains, river water choked with run-off and seepage of sewage and other kind of pollutants. Majority of water bodies including R. Gomati and main drains are also facing heavy encroachment for shopping complex, residential and other purposes. The problems of civic arrangement of traffic on roads, sewage discharge, water supply, electricity, solid waste disposal, cremation of dead bodies, levels of pollutants in soil, water and air have increased abruptly in the urban area. The city is deprived of 'Itra' and 'Chameli' oil production and not only this, the famous maize crop and 'Newar Radish'. Therefore, the main objective of this kind of study is to project strategies of eco reforms and model feasible management plans for Jaunpur urban landscape based on the observations and research findings.

**KEYWORDS :** Urban, Pollution, Eco Reforms, Management, Smart City

The name of Jaunpur is derived from Jamadagni a famous 'rishi' and the place was earlier called as Jamadagnipura. Some authors believe that it was colonized in 1359 AD by Firoj Shah Tughlaq and was called after the name of his elder brother Mohammed-Bin-Tughlaq alias Juna. The city is famous for various cultural heritage sites and devotional places. The Gomati River (Adi Ganga) is a major source of water of Jaunpur city. Nowadays there is pressing demand of people to give it symbol of "state river of U.P.". The city refuse in the form of untreated municipal sewage is constantly discharged into river water and a few ponds are also polluted which receive drain waters and run-off material from the surrounding inhabited localities (Singh et al., 1999). The drains are the main sources to transport domestic, agricultural, septic sewer effluent from slaughter houses, automobile service stations and discharge from cottage industries pollutants into river water (Tripathi, 2002 and Singh, 2007). Other pollution sources of R.Gomati are washing of clothes, utensils, animals, bathing, 'murti visharjan' in the river water, cremation 'ghats', solid waste pollutants, defecation, rearing of domestic animals on the river banks. Levels of pollutants have increased in soil, water (including ground water) and air abruptly in the urban area.

Increase in population in the Jaunpur municipal board (1, 80,009 census, 2011) might be due to movement of people in urban areas from rural setting in search of

employment, education, medical, comfort and other facilities. Large number of population haunts the city as daily visitors. Civic arrangements have started falling short and causing environmental degradation. It can barely hold economic growth, environment, social and cultural attributes. The present paper highlights some sources and sites of pollution load and methods of eco reforms and management plan of Jaunpur city based on logical and scientific ground to full fill some of the criteria of smart city.

### MATERIALS AND METHODS

The present investigation is based on general survey of Jaunpur municipal board area many times to identify the causes and sites which are severely polluted, and other acute problems faced day to day life by local inhabitants. Two study sites were selected, for the study (1) R.Gomati water at two 'Ghats', i.e. (i) Up stream site-Gokual ghat(control site) (ii) Down stream- Ram ghat (polluted site) (2) Chaukia Pond. The water samples were collected at monthly intervals from April, 2012 to March, 2013 at selected sites (1&2) and sampling points. Study of some important physico-chemical properties of water were done by using standard methods (APHA, 1985).

### RESULTS AND DISCUSSION

**It can be discussed in two different heads**

A. Ecological Integrity of R.Gomati and Chaukia Pond

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Presence of two much undesirable foreign matters in the water, impact of anthropogenic factors and urbanization have adversely influenced the quality and wholesomeness of water of R.Gomati and Chaukia Pond (Table.1). It all leads to eutrophication of water where BOD becomes high and DO drops down and not conducive for aerobic respiration. There are heavy encroachment of R.Gomati embankments with solid waste pollutants. Drains are pouring untreated sewage. Whereas washing, bathing, defecating are other abuses of river ecological integrity. The two burning 'ghats' (a) Baradari 'ghat' (Katghara) (b) Ram 'ghat' (Pachhatia) add another dimension of river water pollution in Jaunpur. It was observed that in total about 7,000 to 7,500 dead bodies are burnt per year at Jaunpur on two burning 'ghats' with the help of 3,281 to 3,515 tons of fire wood. To full fill the requirement of fire wood large number of tree from 28 to 30 hectares are deforested every year. During this process 3,589 to 3,749 tons of ash containing huge amount nitrogen, phosphorus and other minerals including 40 tons of flesh from half burnt dead bodies released in R.Gomati per year based on calculation (Tripathi, 1983).

#### B. Strategies of Eco reforms and Management

It is not possible to highlight all about eco reform or eco development plan of Jaunpur a model for urban landscape growth and management in 4-5 pages articles like this but at least some important points may be discussed below:

- (i) Some important ponds like Chaukia, Raja Shab and Teli Ka Pokhara in the city municipal board are subjected to intense periodic anthropogenic forces should be free from pollutants and should be developed as model scenic beauty spots by renovation and reconstruction of stairs of 'Ghats' etc. These water bodies may be used for fish culture and boating. It all needs removal of silt, macrophytes, maintenance of water and pollutant levels at certain periodic intervals. There should be plantation of beautiful vegetational cover, with shades and fixed benches around the ponds at certain points.
- (ii) There is an urgent necessity of electric crematoria at 'Ram Ghat' (Singh, 1998) of R.Gomati as burning dead body by wood is 3-4 times costly (Tripathi et al., 1984) than electric cremation. It would save the river from calefaction (warming), ash load and half burnt dead bodies. Flowers and garlands thrown in Chaukia pond and in the river after worship of God and used in respect of dead bodies should be reused for compost manure instead of left for polluting water.
- (iii) There is no sewer line or sewage treatment plant in Jaunpur. But there is a ray hope in future, in the form of project named 'Gomati Action Plan' waiting some more financial support, to full fill all the necessary requirements which are needed for the establishment of a perfect sewage treatment plant. The sewer from houses of municipal area collected by more than 20 big drains of about 10,975.00 m (10.98 km) and additional to these drains there are about 150 km side drains. Only 10 % drains are cemented and covered, rests are open providing mostly hospitable conditions for mosquitoes. They must be constructed by cement, concrete, bricks and should be covered. These all need removal of garbage in the form of solid waste pollutants and removal of settled or silted soil at certain periodic intervals.
- (iv) The encroachment of embankment land and R.Gomati corridors for demonstration of domestic animals, unauthorized buildings, houses, shops, dumping of garbage, slums, solid waste pollutants, defecating, bathing, washing, upwelling of river bed by siltation, drains falling laden with pollutants and other abuses of river ecological integrity should be checked. The effluents with toxic or biomagnifying chemicals from cottage industries, run-off water full of pesticides from crop fields should not be permitted without treatment.
- (v) Plantation of multiple fast growing trees, hardy and less hardy grasses, sedges and other herbaceous plants which have high conserving efficiency of soil, water, nutrients and preservation of plant diversity have been advocated (Ambasht, Singh and Sharma 1984; Singh et al., 2013) on both the sides of riparian corridors.
- (vi) Removal of deposited silt in river bed of Gomati, garbage and solid waste pollutants lying on riparian corridors should be in practice by the people with

**Table 1: Physico-Chemical Characteristics of R. Gomati Water at Two Sites (I & II) and Chaukiya Pond in Jaunpur City (Annual Average from Apr., 2012 to March, 2013)**

Physico-chemical Parameters	Sampling Sites of R.Gomati (1)		Chaukiya Pond (2)
	Control (Site I)	Polluted (Site II)	
Temperature °C	22.5	24.0	22.9
pH	7.6	8.3	7.9
Transparency cm	22.3	18.6	20.7
Electrical conductance $\mu\text{s cm}^{-1}$	297	450	380
Total Solids $\text{mg L}^{-1}$	245	364	325
COD $\text{mg L}^{-1}$	5.37	135.43	97.9
BOD $\text{mg L}^{-1}$	4.61	96.70	45.40
DO $\text{mg L}^{-1}$	6.21	4.50	5.31

coordination of municipal board and district authorities. Recently education and creation of awareness not to pollute the R.Gomati by citizens of Jaunpur is appreciable as it has started with certain mission 'Kal Kaie Liae Jal'. There is a ray of hope with new Government in the centre to clean R.Ganga and its main tributary R.Gomati.

- (vii) Solid waste treatment plant project is in progress at Kolhnamau near by 7 km from Jaunpur city by efforts of authorities of Jaunpur municipal board. It should be appreciated and hope it will start its functioning as soon as possible.
- (viii) Use of polythene bags must be stopped for carrying shopping goods thrown as waste after uses, all these choked the drains and eaten by cattle which cause loss of life by blockage of intestine. Wandering of domestic animals on roads and many furious bulls causing nuisances with human being as loss of life, injury of human body, create problem in free movement of traffic causing pollution by discharge of fecal matters. It all should be taken in consideration by local government and should provide immediate remedy measures.
- (ix) There is an urgent necessity to ban on selling of Gutaka (Pan Masala) manufacturing and selling of 'Dohara' of Jaunpur. These all are causing serious

mouth cancer disease in Jaunpur.

- (x) The old 'Subjimandi' creating much pollution and traffic problems in the heart of the city it must be replaced slightly out side or the present area may be reconstructed and managed in such a way with the facilities of toilet and sellers may be nominally charged to meet the cost of upkeep and cleanliness.
- (xi) Vegetables grown mostly in the northern part of the city irrigated by sewage water are not congenial for human health. This practice must be discouraged and stopped if possible.
- (xii) Strictly eco-friendly disposal of wastes from slaughter houses, hospitals, vegetable 'satties' and dead animals are required before creating foul smell. Unused wasted parts of green vegetables may be used to prepare bio fertilizers.
- (xiii) There is no supply of safe and sufficient drinking water by municipal board as at certain places water is mixed with drain water and creating water born diseases in human being. There should be regular monitoring and checking of supply of drinking water by sanitation and maintenance of underground pipes are required. Some new tub-wells borings are required to fulfill the need of water.
- (xiv) Use of loudspeakers and high frequency sound boxes like DJ etc. should be restricted or allowed with

permission and not to allow at any cost from 10 p.m. to 6 a.m.

- (xv) There is no proper traffic control due to unauthorized encroachment by shops and use of roads for selling goods. Marriage halls in the city are also causing hindrance in easy flow of traffic. The centre parking used few years back was slightly better in the movement of traffic. Traffic police and local police must control the situation of 'Jam' every day during peak hours of schools, colleges, offices and courts. Entry of school buses, taxi, cars, tractors, bullock carts should not be allowed at any cost from 9 a.m. to 9 p.m. in the busy routs of city except ambulance. People miss their trains, patients die in the way before reaching in the nursing homes and hospitals due to 'Jam' situation. Over loaded 'daga mar' vehicles of schools, colleges should not be allowed to run for safety of children.
- (xvi) Eco-friendly plan must be implemented with more toilet facilities in the main market. Halls and lawns must be developed with green belts in newly extended city areas for different community functions on cheap and prescribed rates. The Kila road from 'Sahi Fort' of Jaunpur to Sadbhawan Bridge may be developed as ideal road or 'Mall road'. Plantation of ornamental trees and shrubs in short block on sides of roads where ever feasible should be taken as drive.
- (xvii) There is need of management plans for old 'mohallas', lanes and by lanes sanitation, water supply, sewage and street light. Construction of main roads and 'mohallas' are needed after removing encroachments. There should not be any compromise in quality of newly constructed roads and in their maintenance.
- (xviii) Three railway over bridges, i.e. Jagdishpur, Marhiu 'Parava' and at Naieganj railway crossing are needed for smooth running of traffic. One more booking window of tickets at least needed in city railway station and some counters of railway tickets are needed in the main markets for selling of tickets and reservations.
- (xix) Railway and bus stations must also be considerably improved with safe drinking water points, toilets. These places should be free from beggars, pocket cutters, thieves, and some other cheaters mostly involve in reservation of railway tickets and in district hospital.
- (xx) There is need of more 'Sulabh Sauchalia' in the district hospital, in the campuses of civil and district courts, bus stations, bus 'parava' and in district hospital. There should be also arrangements of safe drinking water, tea, coffee, cold drinks, fruits and fruit juices and hygienic snakes.
- (xxi) Supports for local agriculture, vegetables, famous 'Newar Reddish', Jaunpur maize crop and financial help is needed to restart 'Itra', Chameli Oil cottage industries etc. as the earlier Jaunpur was famous for these.
- (xxii) We have to think and accelerate renewable energy sources like solar collectors, power panels, biogas, water harvesting, green roofs, vertical landscaping and periodic health check up camps at least for children and needy senior citizens.
- (xxiii) 'Dag Mar' vehicles creating pollution should be banned. There should be regular monitoring of air with dust load, hydrocarbons etc. at certain spots in the city.
- (xxiv) Finally, there should be general awakening and environmental education among the residents of Jaunpur and visitors to keep clean, hygienic environment free from pollution in the city area. Control of over increasing population mass education of children, problems health awareness should be given top priority. It is good enough recently District administration has taken some serious steps in some busy routs to demolish unauthorized encroachments of roads and shifting of bus and tempo 'Parava' slightly away from busy parts of city. Innovation and beautification of JCS, Vizidpur, Polytechnique, Naieganj, Kuttupur road crossings, Sahi Fort road etc. are good steps to give new look. 'Murti Bisharjan' during Durga and Lakchami puja has been carried out in the large excavated pits full of water in the

proximity of the R. Gomati banks. Such steps must be appreciated and should continue in the future according to need without any if and but.

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### REFERENCES

- Ambasht R.S., Singh M.P. and Sharma E., 1984. Soil, water and nutrient conservation by certain riparian herbs Jour. Environmental management, Academic Press, London 18:99-104.
- APHA 1985. Standard methods for the examination of water and waste water. American Public Health Association, Washington, D.C. : 1001.
- Singh Meenal and Singh M.P., 1999. Strategies of eco reforms of Jaunpur to meet pollution changes in 21st century. Proc. Nat. Conf. Start for better Environ. in 21st century, S.B.P.G.College Baragaom, Varanasi, 8-10 Oct. 1999: 134-142.
- Singh Ekta, 2007. Ecological investigations of different municipal drains in Jaunpur. Ph.D. Thesis, V.B.S.P.U. Jaunpur, U.P.
- Singh M. P., 1998. Gomati water pollution and health hazards at Jaunpur. Proceeding of National Conference on Social Pollution and Human Life: 119-123 Sahkari P.G. College, Mihrawan, Jaunpur, U.P.
- Singh Mayank and Singh M.P., 2013. Assessment of plant diversity indices and exploration of ecological strategies for the management of Gomati riparian corridors in district Jaunpur. Ecoprint ECOS, Nepal 20 : 71-78.
- Tripathi A. K., 2002. Effect of municipal wastes on the riparian ecosystem along river bank at Jaunpur. Ph.D. Thesis, V.B.S.P.U. Jaunpur, U.P.
- Tripathi B. D., 1983. River pollution an over view. National Conference on River Pollution and Human Health. Centre of Advance Study in Botany, B.H.U. Varanasi, Feb. 20 & 21, 1983: 20-23.
- Tripathi B. D., Ambasht R. S. and Sikandar M., 1984. Ecological investigation on the plant biomass and energy used for the burning of dead bodies at Varanasi Ghat. River Ecology and Human Health, R.S.Ambasht & B.D. Tripathi (Ed.) Varanasi: 62-69.