RESEARCH DIRECTION
UGC Sr. No. 45489
ISSN NO – 2321-5488
Vol.: 6/ Issue: 1, July 2018

THE STUDY OF ENVIRONMENTAL POLLUTION OF JALGAON CITY

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STUDY AREA :-

Jalgaon city is located on $20^{o}55$" N latitude and 75^{o} 30' E longitude, situated on right bank of Girna river, on the Dhule Nagpur National Highway No. 6 and Mumbai-Bhusawal-Delhi, Mumbai-Bhusawal-Kolkata, Bhusawal-Surat railway routes. According to 2001 census, the total population is 3,68,579 persons, whereas in 1991 it was 2,42,193 persons and covers an area about 62.29 sq.km. (Fig. 1)

MATERIALS AND METHODS: -

The required data for present study has collected from various primary and secondary sources. The data collected from various government departments, i.e. Census Department, Municipal Corporation Office, Town Planning Department, News Papers, and Journals etc. The data has also collected with the help of questionnaires, field work and personal interviews. The collected data has tabulated, classified, presented, compared and interpreted with help of various appropriate statistical methods. Tables, diagrams and maps have used at appropriate places and their interpretation has realized the present study.

DISCUSSION AND RESULT:-

WATER POLLUTION:

Water is one of the prime necessities of life. Water resources have been most exploited natural system, since man strode the earth. It shows the result by causing water quality deterioration. World Health Organization (1966) defined water pollution as ,"Foreign Materials either from natural or other sources are contaminated with water supplies and may be harmful to life, because of their toxity, reduction of normal oxygen level of water, aesthetically unsuitable effects and spread of epidemic diseases." Here an attempt has been made to study the problem of water pollution Jalgaon city.

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The Table-I shows the various pollutants contain in drinking water, bore well water, dug well water, Nalla and lake of the Jalgaon city. It is observed that the highest P^H value is found in Lendi Nalla, while lowest P^H found Vidyut colony dug well water. The high electrical conductivity and high amount of chlorides, biochemical oxygen demand, chemical oxygen demand, sulphates, phosphates, potassium is observed in Lendi Nalla water. The higher amount are may be due to continuous addition of household waste sewage and sewer lines into the all water. The low electrical conductivity and lowest amount of chlorides and hardness is present in borewell water of Ramanand Nagar, Old Jalgaon

TABLE I

JALGAON CITY

CONTAIN OF WATER POLLUTANTS

(YEAR 2005)

Sr. No.	Name of the Location (Sampling Stations)	P^H Value	Electrical conduc-tivity in Milimbos	Chloride in Mg / Lit	Hard-ness in Mg / Lit.	Bio-chemical Oxygen Demand in Mg/Lit	Chemical Oxygen Demand In Mg / Lit	Dissolved Oxygen in Mg/Lit	Total Solids Mg/Lit	Sulphates Mg / Lit	Phosph-ates Mg / Lit	Sodium Mg / Lit	Potas-sium Mg / Lit
BORE WELL													
1	Old Jalgaon	7.21	0.867	20	162	138	240	-	770	56.25	0.53	40	0.98
2	Nehru Chowk	8.10	0.837	337	181	30	40	-	870	72.50	0.64	72	1.23
3	Shivaji Nagar	6.33	0.998	479	213	101	160	-	1220	51.20	0.60	38	1.88
4	SMIT College	7.56	1.217	753	278	54	120	-	1570	47.50	0.42	45	0.77
5	Idgaon Road	6.56	1.146	665	258	86	80	-	1590	77.00	0.38	39	0.56
6	Ramanand Nagar	7.98	0.427	168	101	120	200	-	350	86.00	0.55	37	0.89
7	Shrikrishna Colony	7.44	1.091	558	273	27	40	-	1490	55.00	0.42	31	0.25
8	Dadawadi	7.23	0.841	461	192	85	120	-	1050	61.20	0.56	47	0.14
DUG WELL													
1	Old Jalgaon	7.44	0.930	124	218	515	840	-	860	69.00	0.19	39	0.41
2	Bank Colony	6.89	1.347	233	196	185	320	-	1630	86.00	0.42	37	0.22
3	Vidyut Colony	6.21	0.927	89	169	179	360	-	980	40.00	0.22	40	0.77

and drinking water of old city. High chlorides concentration was observed in the Mehrun Lake water may be due to bathing, washing and activities of human and animals.

The dissolved oxygen levels are below detectable limits at all the sampling station of Khawajamiyan and Lendi Nalla, while highest level of dissolved oxygen is observed in Mehrun lake. It is also observed that Khanderao nalla water is comparatively less polluted as it shows same amount of dissolved oxygen in its water sample. Inferior ground water quality is observed for the bore well water from the area where the waste is dumped. It is observed that the bore well water contains high amount of chlorides, total solids and hardness. The dug well also shows high

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amount of hardness, biochemical oxygen demand and total solids. The increase in chloride concentration in the well water may be due to intersection of sewage water into the well.

AIR POLLUTION :

The pollution of our environment is one of the biggest hazards that humanity faces today. Urban air pollution has worsened the health in the cities of both developed and developing countries. The health impacts in developing world have driven by population growth, industrilization and increased vehicle use. The combustion of fossil fuel and their products are responsible for a sizable amount of anthropogenic air pollution and this problem is particularly acute in urban areas. According to World Health Organisation (WHO), "air pollution is defined as limited to situation in which the outdoor ambient atmosphere contains materials in concentration, which are harmful to man and his surrounding environment."

Jalgaon city is a trade and commercial centre of Khandesh region. The population of Jalgaon has increased by 23 per cent during 1981-91 and 19 per cent during 1991-2001. Now, the population of Jalgaon is about 4,00,000 persons. With the growing population the number of vehicles are also increasing continuously. As a result the levels of air pollution is increasing day by day in the city. This growing trend of air pollution is a serious threat to the health of population. The National Highway No. 6 is passing through the city is an additional source of air pollution to the area.

TABLE II
CONTAIN OF AIR POLLUTANTS - (YEAR 2005)

Sr. No.	Name of the Location (Sampling Station)	Oxides of Sulphur ($\mu g/m^3$)	Oxides of Nitrogen ($\mu g/m^3$)	Respirable Suspended Particulate Matter (RSPM) ($\mu g/m^3$)	Suspended Particulate Matter (SPM)) ($\mu g/m^3$)
1	Ajanta Chowk (Industrial)	55	39	201	396
2	Mahabal Colony (Residential)	10	5	90	156
3	Golani Market (Commercial)	18	10	119	211

Source :- Environmental Status Report 2004-05, J.M.C.

Air quality status in Maharashtra State is no more different than the other urban centres of the country. Maximum cities in Maharashtra State are facing the problem of uncontrolled traffic and poor road quality. The traffic density on the National Highway, which is going through the heart of the Jalgaon city, is at peak level throughout the year. The Table II and Figure

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4 shows the Ajanta chowk is busiest spot for heavy traffic flow. The maximum concentration of oxides of sulphur (55 □g/m^3) and oxides of nitrogen (39 □g/m^3) was recorded at Ajanta chowk. The level of suspended particulate matter (SPM) 396 □g/m^3 and respirable suspended particulate matter (RPSM) 201 □g/m^3 were recorded at these locations.

NOISE POLLUTION :

Noise pollution may be defined as the state of discomfort and restlessness caused to humans by unwanted high intensity sound known as noise. Noise emitted from every source in the environment is an undesirable by product of our modern way of life. Today, transportation has become major contributor to overall noise pollution. Unfortunately, in the planning of major roads and highway projects in India, future expansion of urban centres is not taken into consideration. As a result, i) unplanned road traffic in city was observed, and the highways are passing through the heart of most urban centres, ii) intolerable road traffic is adversely affecting the nearby population exposed to continuous noise pollution and iii) it is difficult to determine the impact of noise, being slow and long lasting.

The mild noise can be annoying while excessive noise can be destroy a person's hearing ability. Research has shown that high noise levels are linked with several physiological and psychological problems. In India the total contribution of traffic noise is about 55 per cent of the total noise pollution.

TABLE III
LEVEL OF NOISE -(YEAR 2005)

Sr. No.	Name of the Location (Sampling Stations)	Noise Level in dB (A)								
		Morning 8.00 a.m. to 10.00 a.m.			Afternoon 13.00 to 15.00 pm			Evening 18.00 pm to 20.00 pm		
		L. Max	L. Min.	L. Avg.	L. Max	L. Min.	L. Avg.	L. Max	L. Min.	L. Avg.
1	Gujaral Petrol Pump chowk	85	64	72	84	67	71	81	77	80
2	Akashwani Chowk	84	70	80	85	72	77	80	71	77
3	Icchadevi Chowk	85	75	88	82	74	78	83	79	80
4	Ajanta Chowk	82	79	81	88	82	85	85	81	82
5	Shastri Tower Chowk	72	60	66	70	67	69	79	71	74
6	Lilatai Bendale Chowk	79	70	73	68	63	65	80	71	73
7	Court Chowk	72	65	67	70	64	65	75	70	72

Source : Environmental Status Report 2004-05, J.M.C.

The Table III and Figure 5 shows tremendous increase in noise levels at sampling stations of Jalgaon city. Normal level of sound intensity is 60 dB, but all study centres having more than

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60 dB sound intensity, which cause the noise pollution in the city. The morning and evening hours are characterized by heavy traffic hours at Akashwani, Icchadevi and Ajanta Chowk. At the locations the noise levels ranges between 80-88 dB (Average). Lower levels of noise are recorded in the afternoon session except Ajanta chowk. Heavy traffic flow generating higher noise is observed at Ajanta Chowk. Only at Gujaral petrol pump chowk the lower noise levels are recorded in the morning and afternoon session.

SOLID WASTE POLLUTION :

With rapid urbanization in recent years, like a Jalgaon city number of cities in India are experiencing waste management problems similar to other major cities in the world. Solid waste pollution creates number of environmental problems viz. air, ground and surface water pollution. The depletion in quantity and quality of environmental resources has adverse impacts on life. Leachate from waste dumpsites can potentially enter in the ground or surface water resources. The sources of Municipal solid waste are houses, shops, markets, hotels, schools, colleges and road sweepings. A variety of biodegradable and non-biodegradable materials are present in the above wastes. It contains food waste, paper, plastic, rubber, rags, metals, glass, yard waste and packaging materials, agricultural waste etc. The unplanned collection of waste in community bins and its transportation to disposal site into open vehicles causes real public nuisance.

In the study region, nearly 200 tones of solid wastes collected daily by municipality with 20 Tractors, 6 Dumpers and 2 J.C.B. There are some small trucks or vans which collect the solid wastes called as 'Ghantta Gadi', they collect house to house solid waste in residential area of the city. There are about 815 public dust bins on various road side in city with per 500 kg waste material capacity. Even after it is not possible to collect whole solid waste of the city and collected solid waste is not properly processed. The general practices of solid waste management in Indian cities are as follows-

* Open dumping method.
* Scientific land filling method.
* Composting method.
* Energy recovery method.
* Recycling method.

Out of above methods only open dumping method is used in the study region, but in some cases composting method is also used i.e. for the vegetables market wastes. But composting and dumping is not done by scientific method. There was a project in Jalgaon city of Resource Company produced fertilizer with the help of vegetables and agricultural wastes. But

ISSN NO – 2321-5488
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now this project is closed, which is situated near Mamurabad road. Due to absence of proper method of solid waste management high solid waste pollution and their effect is observed in Jalgaon city.

TABLE VI
SOLID WASTE POLLUTION

Sr. No.	Dumping Stations	PH Value	Conduc-tivity (Milim-hos)	Alkali-nity Mg/ Lit.	Sulph-ate Mg/ Lit.	Chemical Oxygen Demand Mg/Lit.	Biochemical Oxygen Demand Mg/Lit.	Nitra-tes %	Phosp-hate Mg/Lit.
1	Dadawadi	8.1	2.56	1256	1787	2700	1256	21	25
2	Ahuja Nagar	8.6	4.78	2487	1598	3871	1789	17	27
3	Pachora Road	5.9	4.78	5478	1200	8759	3789	28	45
4	Bhusawal Road	8.6	3.68	5843	1247	7426	4717	24	31

Source :- Environmental Status Report 2004-05 by J.M.C

It is observed from the Table VI that the leachate generated from the solid waste dumping sides carries high pollution load. Higher level of hardness, BOD, COD, total solids, total dissolved solid, total suspended solid, chlorides and nitrates were observed in the leachate. The lechate generated from Pachora road dumpsite shows high amount of alkalinity, electrical conductivity, nitrates and phosphates. This shows the need of proper process for solid waste management in Jalgaon city.

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