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Reservoirs Impact on Ecology from Osmanabad District, Maharashtra, India

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Abstract

The study was conducted in the ecological impact due to reservoir geographical area of Osmanabad districts its aims to determine the effect of ecology from reservoir. There were Eighteen reservoirs studied, Studied its Physical status like storage capacity, canal system, total command area, total cultivable area, studied all reservoirs provide a canals which is main role impact onecology.

Keywords: Percolate, Economic, Irrigation, Geographically, Agricultural.

I. INTRODUCTION

Water is essential for all forms of life on earth. It is not evenly distributed all over the world and even its availability at the same locations is not unique over the year. While the parts of the India, which are scarce in water and create to drought, other parts of the India abundant in water and face a challenging of flood problem. Alberta (1974). The rivers are a valuable creation by nature and have been playing a chief role in development of various civilizations, rivers, at the time of floods, have been playing disaster role with the life and property of the people. Planning of store water of flooded rivers it is the most prime issues. Optimal management of river water resources demands that specific plans should be required for various river basins which are found to be technically feasible and economically viable after carrying out extensive surveys. From the ancient civilization, man has been constructing reservoirs for storing surplus river waters available during wet periods and for utilization of the same during lean periods.Bates et, al, (2008).The reservoirs world over have been playing dual role of conservation to the river waters for accelerating socio-economic growth of the India. Geography of India suffering from the floods and droughts. P. D. Patil(2007).Reservoirs are essential part of all community it's useful for supply the water to urban and rural area as well as foragricultural and industry Marisol Bonnet et, al, (2015).The reservoirs contribute significantly in fulfilling the following basic human needs

- Water for drinking and industrial use
- Irrigation
- Flood control

a) Water for drinking and industrial use

In India found to large variations in rain cycle, so organization constructed dams and reservoirs for store the water which is use during periods of surplus water availability and conserve for use during required periods when the water availability is scarce. Well managed and designed dams play a great role in optimally the drinking water requirements of the people.Water stored in reservoirs is also used vastly for industrial needs. Deposited flow of water in reservoirfrom river help in diluting harmful dissolved substances in river waters during lean periods by supply low inflows and thus in maintaining and preserving quality of water within safe limits.Gomide F (2012)

b) Irrigation

Reservoirs are constructed to store surplus waters during rainy season, which can be used for irrigating to lands. It is the major benefits of reservoirs is that water flows can be regulated as per agricultural requirements of the various regions over the year. Reservoirs exchange unforgettable services to the mankind for irrigation requirements. It is planed that 80% of extra food production by the year 2025 would be available from the irrigation in India and it is made possible by reservoirs. Reservoirs are most needed for irrigation requirements of developing country. Those rivers who are dumped water in sea and create a flood which are control the water by reservoir and use it to irrigation.Diamant, B.Z.,(1980)

c) Flood Control

Floods in the rivers have been many a time playing disaster role with the life and property of the people. Reservoirs can be effectively used to control floods by regulating river water flows downstream. The reservoirs are designed, constructed and operated as per a specific plan for routing floods through the basin without any damage to life and property of the people.The water conserved by means of reservoirs at the time of floods can be utilized for irrigation and drinking water requirement.Dudgeon D (2000).

In Osmanabad district there are reservoirs placed Chandni, Harni, Kurnoor, Khandala, Banganga, Ramganga, Jekekur, Turori, Manjara, Khandeshawar, NimnaTerna, Raighavan, Ruyi, Sakat, Terna, Benitura, Sangmeshwar, Wagholi-KajlaThese are all reservoirs are utilized from for irrigation, and domestic water supply and some are utilize for water supply to industry.

II. MATERIAL AND METHODS

Data was collected ofChandni, Harni, Kurnoor, Khandala, Banganga, Ramganga, Jekekur, Turori, Manjara, Khandeshawar, NimnaTerna, Raighavan, Ruyi, Sakat, Terna, Benitura, Sangmeshwar, Wagholi-Kajlareserviros which constructed in various period. from regarding Governmentoffices from Executive Engineer, Irrigation Department. Local Sectors, Superintendent Engineer, Districtcommittee, and analyzed it statistically.

III. ABBREVIATIONS

M- Meter,
MCM- Million Cubic Meter,
Hec- Hector,
KM – Kilometer

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Table No. 1 Reservoirsconstructed before 1985

Reservoirs Name	Place of Taluka	Construction Year	Estimated Cost of Project (In Lac)	Height of Reservoirs (Meter)	Canal Sanctioned (Km)	Maximum Capacity (MCM)	Actual Water Storage (MCM)	Total Command area (Hec.)	Total Cultivable area (Hec.)	Irrigated area	Uses Of water for Drinking (MCM)	Uses Of water for Agri (MCM)	Uses Of water for Industry (MCM)
Chandni	Paranda	1966	212.5	20.7	23.5	23.78	21.58	2470	2240	2040	4.088	17.492	0
Harni	Tuljapur	1966	76	16.57	37.5	12.58	11.167	2112	1890	1660	0.547	10.629	0
Kurnoor	Tuljapur	1967	100.83	23	9.5	35.26	32.28	4117	3880	3644	3.014	26.536	2.73
Khandala	Paranda	1972	57.4	13	5.6	6.257	5.244	1205	1017	830	1.67	3.574	0
Bangaanga	Bhum	1975	51.06	8.82	3.5	5.93	4.96	1198	1117	906	2.01	2.95	0
Ramganga	Bhum	1977	95	20.4	2.46	6.14	5.34	1217	1120	963	0.615	4.725	0
Jekekur	Umarga	1979	116.9	14.8	21.25	10.176	7.963	1939	1728	1586	0	4.393	3.57
Turori	Umarga	1985	308.8	17.5	21	7.664	6.119	1250	1095	887	2.6	3.599	0

Table No. 2 Reservoirs constructed after 1985

Reservoirs Name	Place of Taluka	Construction Year	Estimated Cost of Project (In Lac)	Height of Reservoirs (Meter)	Canal Sanctioned (Km)	Maximum Capacity (MCM)	Actual Water Storage (MCM)	Total Command area (Hec.)	Total Cultivable area (Hec.)	Irrigated area	Uses Of water for Drinking (MCM)	Uses Of water for Agri (MCM)	Uses Of water for Industry (MCM)
Manjara	Kalamb	1984	17602	25.5	168	224.09	104.78	265.26	23690	18223	31.957	130.67	1.324
Khandeshawar	Bhum	1987	205	17.14	16	10.84	8.8	1815	1650	1471	1.27	7.53	0
Nimna Terna	Lohara	1989	16333	26.3	154	121.19	23.223	15600	14513	11610	1.151	0	0
Raighavan	Kalamb	1992	95	13.23	19.7	12.704	11.259	2107	1915	1700	0.7	10.559	0
Ruyi	Osmanabad	1994	910.361	11.75	29	8.941	8.605	2005	1812	1650	2.23	6.255	0.12
Sakat	Paranda	1994	1664	14.77	24.5	14.488	13.469	2789	2517	2355	0.725	13.469	0.429
Terna	Osmanabad	1994	259.09	15.08	33	20.544	19.66	2015	1825	1652	3.58	13.26	2.82
Beniture	Umarga	2000	202.6	13.38	44	12.843	11.5	2612	2420	2293	6.732	4.568	0.2
Sangmeshwar	Bhum	1995	4404.61	15.22	70	16.82	15.03	3742	3538	3350	4.58	10.45	0
Wagholi-Kajla	Osmanabad	2009	1487.187	13.48	23	7.246	6.21	1942	1729	1550	1.35	4.86	0

IV. Result and Discussion

Table No. 1 Shows First reservoir Chandni is placed in Parandataluka and constructed in 1966 its project cost was 212.5 lacs and its hight is 20.7 meter and Canal sanctioned was 23.5 kilometer, its maximum capacity is 23.78 million cubic meter , actual water storage is 21.58 million cubic meter, Total command area is 2470 hector, total cultivable area is 2240 hectore, irrigated area is 2040 hector, water used for drinking 4.088 million cubic meter, water used for agri 17.492 million cubic meter. Second reservoir Harni placed at Tuljapur taluka it is constructed in 1966 its construction cost is 76 lacs, its height is 16.57 meter, canal is sanctioned 37.5 kilometer, Maximum capacity is 12.58 million cubic meter, its actual water storage is 11.167 million cubic meter, total command area is 2112 hectore, total cultivable area is 1890 hectore, irrigated area is 1660 hector, uses of water for drinking 0.547 million cubic meter, uses of water for agri is 10.629 million cubic meter, Third reservoir is Kurnoor placed at taluka Tuljapur and constructed in 1967, its project cost was 100.83 lacs, its hight is 23 meter, canal is sanctioned 9.5 kilometer, maximum capacity is 35.26 million cubic meter, actual water storage is 32.28 million cubic meter, total command area 4117 hector, total cultivable area is 3880 hector, its irrigated area 3644 hector, uses of water for drinking 3.014 million cubic meter, uses of water for agri is 26.536 million cubic meter, uses of water for industry is 2.73 million cubic meter. Fourth reservoir is Khandala and placed in Parandataluka and constructed in 1972, its project cost was 57.4 lacs, its hight is 13 meter, canal is sanctioned 5.6 kilometer, maximum capacity is 6.257 million cubic meter, actual water storage is 5.244 million cubic meter, total command area is 1205 hector, total cultivable area is 1017 hector, irrigated area is 830 hector, uses of water for drinking 1.67 million cubic meter, uses of water for agri 3.574 million cubic meter. Fifth reservoir is Banganga placed at Bhum and constructed in 1975 , its project cost is 51.06 lacs, its height is 8.82 meter, canal is sanctioned 3.5 kilometer, its maximum capacity is 5.93 million cubic meter, actual water storage is 4.96 million cubic meter, total command area is 1198 hector, total cultivable are is 1117 hector, its irrigated area is 906 hector, uses of water for drinking is 2.01 million cubic meter, uses of water for agri is 2.95 million cubic meter. Sixth reservoir is Ramgang placed at Bhumtaluka and constructed in 1977, its project cost is 95 lacs, its height is 20.4 meter, canal is sanctioned 2.46 kilometer, maximum capacity is 6.14 million cubic meter, actual water storage is 5.34 million cubic meter, total command area is 1217 hector, total cultivable are is 1120 hector, its irrigated area is 963 hector, uses of water for drinking is 0.615 million cubic meter, uses of water for agri is 4.725 million cubic meter. Seventh reservoir is Jakekurplaced at Omergataluka and constructed in 1979, its project cost was 116.9 lacs, its height is 14.8 meter, canal sanctioned is 21.25 kilometer, actual water storage is 7.963 million cubic meter, total command area is 1939 hector, total cultivable area is 1728 hector, irrigated area is 1586 hector, uses of water for agri is 4.393, uses of water for industry is 3.57 million cubic meter. Eight reservoir is Turori placed at Omergataluka and constructed in 1985, its project cost was 308.8 lacs, its height is 17.5 meter, canal is sanctioned 21 kilometer, maximum capacity is 7.664 million cubic meter, actual water storage is 6.119 million cubic meter, total command area is 1095 hector, irrigated area is 887 hector, uses of water for drinking is 2.6 million cubic meter, uses of water for agri 3.599 million cubic meter.

Table No. 2 Shows first reservoir is Manjara placed at Kalambtaluka and constructed in 1984, its project cost was 17602 lacs, its height is 25.5 meter, canal is sanctioned about 168 kilometer, maximum capacity is 224.09 million cubic meter, actual water storage is

104.78 million cubic meter, total command area is 265.26 hector, total cultivable area 23690 hector, irrigated area is 18223 hector, uses of water for drinking is 31.957 million cubic meter, uses of water for agri is 130.67 million cubic meter, uses of water for industry is 1.324 million cubic meter.Second reservoir is Khandeshwar placed at Bhumtaluka and constructed in 1987, its project cost was 17.14 lacs, its hight is 16 meter, its maximum capacity is 10.84 million cubic meter, actual storage of water is 8.8 million cubic meter, total command area is 1815 hector, total cultivable area is 1650 hector, irrigated are is 1471 hector, uses of water for drinking is 1.27 million cubic meter, uses of water for agri is 7.53 million cubic meter. Third reservoir is Nimnaternapalced at Loharataluka and constructed in 1989, its project cost was 16333, its height is 26.3 meter, canal sanctioned about 154 kilometer, maximum capacity is 121.19 million cubic meter, actual water storage is 23.223 million cubic meter, total command area is 15600 hector, total cultivable area is 14513 hector, irrigated area is 11610 hector, uses of water for drinking 1.151 million cubic meter. Fourth reservoir is Raigavan situated at Kalambtaluka and constructed in 1992, its project cost was 95 lacs, its height is 95 meter, its height is 13.23 meter, canal sanctioned up to 19.7 kilometer, its maximum capacity is 12.704 million cubic meter, actual water storage is 11.259 million cubic meter, total command area is 2107 hector, total cultivable area is 1915 hector, irrigated area is 1700 hector, uses of water for drinking is 0.7 million cubic meter, use of water for agri is 10.559 million cubic meter. Fifth reservoir is Ruyipalced at Osmanabad district and constructed in 1994, its project cost was 910.361 lacs, its height is 11.75 meter, canal sanctioned for 29 kilometer, its maximum capacity is 8.941 million cubic meter, actual water storage is 8.605 million cubic meter, total command area is 2005 hector, total cultivable area is 1812 hector, irrigated area is 1650 hector, uses of water for drinking is 2.23 million cubic meter, uses of water for agri 6.255 million cubic meter, uses of water for industry is 0.12 million cubic meter. Sixth reservoir is Sakat Situated in Parandataluka and constructed in 1994, its project cost is 1664, height of reservoir is 14.77 meter, canal sanctioned for 24.5 kilometer, its maximum capacity is 14.488 million cubic meter, actual water storage is 13.469 million cubic meter, total command area is 2789 hector, total cultivable are is 2517 hector, irrigated are is 2355 hector, uses of water for drinking is 0.725 million cubic meter, uses of water for agri is 13.469, and use of water for industry is 0.429 million cubic meter. Seventh reservoir is Terna situated at Osmanabad taluka and constructed in 1994 its project cost is 259.09 lacs, its height is 15.08 meter, canal sanctioned for 33 kilometer, its maximum capacity is 20.544 million cubic meter, actual water storage is 19.66 million cubic meter, total command area is 2015 hector, total cultivable area is 1825 hector, irrigated area is 1652 hector, use of water for drinking is 3.58 million cubic meter, use of water for agri is 13.26 million cubic meter, use of water for industry is 2.82 million cubic meter. Eighth reservoir is Beniturapalced at Omergataluka and constructed in 2000 , its project cost is 202.6 lacs, height of reservoir is 13.38 meter, canal sanctioned upto 44 kilometer, its maximum capacity is 12.843 million cubic meter, actual water storage is 11.5 million cubic meter, total command area is 2612 hector, total cultivable area is 2420 million cubic meter, irrigated area is 2293 million cubic meter, use of water for drinking is 6.732 million cubic meter, use of water for agri is 4.568 million cubic meter, use of water for industry is 0.2 million cubic meter. Ninth reservoir is sangmeshwar and palced at Bhumtaluka its construction year is 1995, its project cost is 4444.61 lacs, its height of reservoir is 15.22 meter, canal sanctioned for 70 kilometer, its maximum capacity is 16.82 million cubic meter, actual water storage is 15.03 million cubic meter, total command area is 3472 million cubic meter, total cultivable area is 3538 hector, its irrigated area is 3350 hector, uses of water for drinking is 4.58 million cubic meter, use of

water for agri 10.45 million cubic meter. Tenth reservoir is Wagholi-kajlapalced at Osmanabad taluka and constructed in 2009, its project cost is 1487.187 lacs, its height is 13.48 meter, canal sanctioned upto 23 kilometer, its maximum capacity is 7.246 million cubic meter, actual water storage is 6.21 million cubic meter, total command area 1942 hector, total cultivable area is 1729 hector, irrigated area is 1550 hector, use of water for drinking is 1.35 million cubic meter, use of water for agri is 4.86 million cubic meter.

V. ECOLOGICAL IMPACT

The reservoir wall itself Protect the fishes form reservoir to migrations, some species are special behavior of spawning and breeding habitats. The reservoir traps sediments, which are critical for maintaining physical processes and habitatsdownstream of the reservoir Humphries et, al,.(2014). In reservoir when water store is Changed its previous nature like chemical factors, dissolved oxygen levels, temperature andthe physical properties of a reservoir are often not suitable to the aquatic plants and animals.Large body of reservoir utlize the cultyivation of applied algae production.The reservoir gradually deposited the soil which came from water current which creatsediment these sediment decrease capacity of water storage year by year] S.K. Sharma et, al,. (2007).The river's flow and sediment transport downstream of a dam often causes the environmentalimpacts. All life of around a river evolves and is conditioned on the timing and quantities of river flow Dai, Zhijun; Liu, James T. (2013-02-14). Exchange water current can be as severe as completely de-watering river reaches and the life they contain.Altering the river bottom also reduces habitat for fish that spawn in river bottoms.In gross confine drivers for reservoir have also impacted processes in the broader biosphere. Lot of reservoirs, especially thosein the tropics, are significant contributors to greenhouse gas emissions.Tan Y, Yao F (2006).

a) Significance of Reservoirs-

Reservoirs more reliable source of water supply for irrigation, domestic and industrial use. The reservoirs directly and indirectly support someactivities including sports and recreation, fisheries and wild life, navigation. In reservoir water without any activity growth of algaeand phytoplankton utilized by fishes, zooplankton and other invertebrates, those algae and phytoplankton is play a prime role offood chain in reservoir ecosystem and improve aquatic .Algae release the oxygen by process ofphotosynthesis which is used for increase the oxygen content of water which water is useful for positive growth of fishes and otherzooplankton Gilmor*et, al*,(2016).

b) Non Significance of reservoirs-

Large reservoirs have led to the extinction of many fish and other aquatic species, the removal of birds in floodplains, huge losses offorest, superior farmland and wetland, erosion of coastal deltas. Negative environment effects due to construction activities.And extra civilization due to migrated population.Habitat loss dueto inundation.Environment loss due to increased human activities such as intensive agriculture, industries, and increasedpressure on lands.Exchanging Architecherial activity, changes in water levels higher around the reservoir and lower downstream.Reservoirs affect the social, cultural and economical structure of the region considerably. Especially forcing people to migrate andaffect their psychology negatively (Balba, A.M., 1979).The large artificial reservoir arecreatedwater-borne diseases and parasites procuction. It is are spread towards population and incidence ofdiseases such as and bacillary dysentery,dengue, sleeping sickness, yellow fever, typhus, typhoid fever, cholera, hepatitis, schistosomiasis, guinea worm, Japanese encephalitis, scalies, malaria, andtrachoma, is the direct result of large scale water projects. J.Manatunge*et, al*, (2000).

c) ***Impact of Socioeconomic-***

Large reservoirs have enormous consequences for peoples lives and livelihoods, which include controversial issues such as displacement and resettlement. The opposite of reservoir construction argue that the social and economic consequences of large reservoirs are more far-reaching than those attached with other infrastructure projects because of the huge impact across time and space in both the ecosystem and in economic, social and cultural structures. The impacts are bothless negative and more positiveare illustrated in connection with the reservoir.

VI. CONSLUSION

The reservoirs water can be used for power generation, irrigation purposes. Irrigation occurs only during the growing season .Reservoir construction procedure are mostly expensive to build and must be built to a very high standard. The more cost of construction to reservoirmeans that they must operate for many decades to become profitable. The building of large reservoirs can cause dangerous to geologicalimpact. Construct a large reservoir alters the natural water table. Reservoirs store a large volume of water.Which thereservoirs get over full and lead to an outbreak of water resulting in chances of floods. These floods may be cause a damage to life and property Bayne, D.R. et, al,. (1983). Backwaters of reservoirs is a potential disaster for human life and property. Diseases can spread near reservoir area. Various times macro flora and phytoplankton grow up on the water surface these matters be harmful for the lives of water and people which is fishingand scums play a role of disease vectors.Baxter, R.M. &Glaude, P., (1980).

VII. SUGGESTIONS

Periodic monitoring of reservoirs is necessary for check the crack, extra percolation, and oberser the back water capacity of reservoirs.

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