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A CASE STUDY ON EFFECTS OF UNMAINTAINED IRRIGATION CANAL LOCATED NEAR MAURAIYA VILLAGE, AHMEDABAD

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Abstract: Water is essential to life. Yet water pollution is one of the most serious ecological threats we face today. Water pollution happens when toxic substances enter water bodies such as lakes, rivers, oceans and so on, getting dissolved in them, lying suspended in the water or depositing on the bed. This degrades the quality of water. Not only does this spell disaster for aquatic ecosystems, the pollutants also seep through and reach the groundwater, which might end up in our households as contaminated water we use in our daily activities, including drinking. This study here aims to analyse the causes of canal water pollution, end effect of polluted water in area, and possible economical preventives of canal pollution can be done near the industrial village Mauraiya in south west corner of Ahmedabad city, Gujarat.

Keywords **- Canal Water Pollution, Irrigation Water, Village Sewage systems.**

I. INTRODUCTION

An Irrigation canal can be failed in many ways to provide targeted quantity of water to end user due to various reasons like, lack of water in region, low water level in watershed, unavailability of Irrigation canal infrastructure, unmaintained canal system etc. if all above criteria are satisfied then more chances of sufficient quantity of water is provided to the industries and farmers as needed, however the other main condition along with quantity is quality of water?, if a canal is get polluted at any location in its network then the user cannot use the water for their need of water. We have to understand that various direct and indirect cost are involved for farming like a canal provision in area, cultivable land availability of area near canal, other minimum basic needs availability like farm workers, farm equipment's, good season of farming, Transportation facility in the area, mainly the Sufficient quantity and quality availability of water and many other things that need to be done on time for a successful farming practices.

Water pollution happens when toxic substances enter water bodies such as lakes, rivers, oceans and so on, getting dissolved in them, lying suspended in the water or depositing on the bed. This degrades the quality of water. Not only does this spell disaster for aquatic ecosystems, the pollutants also seep through and reach the groundwater, which might end up in our households as contaminated water we use in our daily activities, including drinking. Water pollution can be caused in a number of ways, one of the most polluting being city sewage and industrial waste discharge. Indirect sources of water pollution include contaminants that enter the water supply from soils or groundwater systems and from the atmosphere via rain. Soils and groundwater contain the residue of human agricultural practices and also improperly disposed of industrial wastes. Pollutants can be of varying kinds: organic, inorganic, radioactive and so on.

II. STUDY AREA

This Minor Distributaries' Canal is a Primarily use in as an agriculture water requirement for the farms and provide water to the further villages, Clean water that is provided in this canal is started from the Gujarat Biggest Watershed project named Sardar Sarovar Narmada Nigam Ltd. That work for dam built on Narmada River and from canal of Narmada river water is intake in Sabarmati river from the point of Karai dam that located between Ahmedabad and Gandhinagar and water stored in the Sabarmati river front and then released from the other end of Ahmedabad named Vasna barrage point and by sub canals distribution system the water flow through Fatehvadi canal the water is provided to villages for their use, but there where the South industrial area of

Ahmedabad say Changodar, Mauraiya, Bavla etc. Canals are passing those Mainly Pharma and Steel industrial area and the water is continued to distributed then further

Our study area is an Irrigation canal for providing water to farms for the near South west side Ahmedabad based small Villages named Nani Devti, Matoda, Palvada and their farms. that have effective Cultivable Commanded Area of 26 Sq.km. and area is provided with the Minor Distributary canal length around 15 KM Length, but the 1.7 KM Length of canal that is passing through heart of village mauraiya is getting much more polluted due to unmaintained and uncontrolled use by villagers and industries, however in this paper we will study only the problem done by the villagers and municipal only

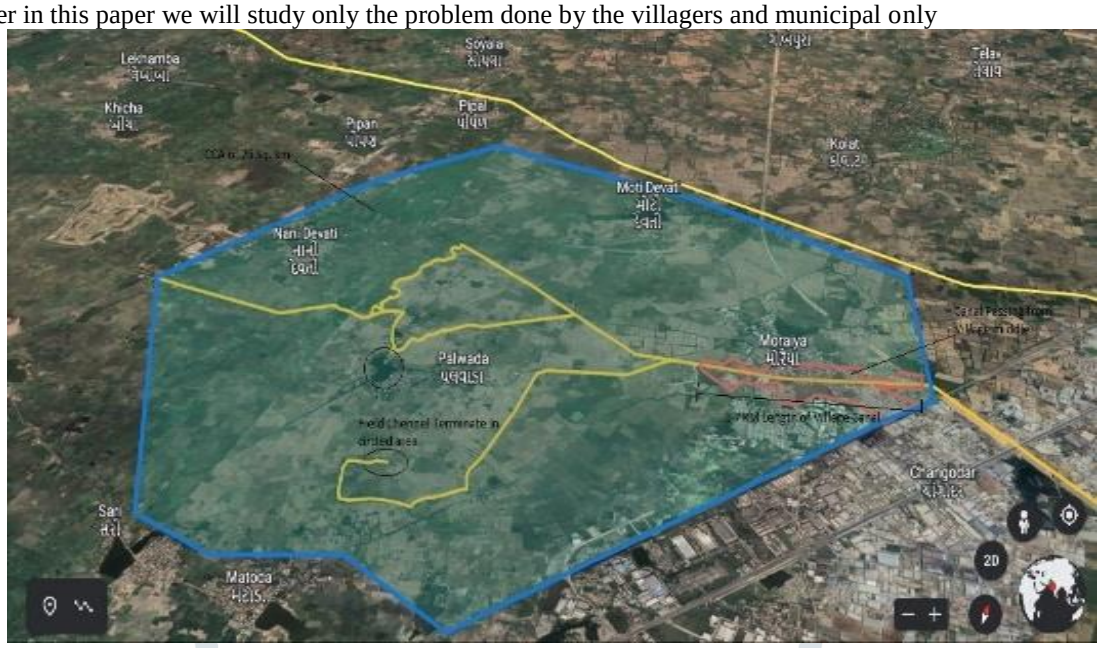

Figure 1 Study area Map showing canal stretch passing from villages and field channel ends in CAA

III. SITE CONDITION AND DATA COLLECTION

Figure 2 Canal Side's Condition where traffic is moving

Figure 3 R.C.C Culvert condition from

Figure 4 Colonies situated near sides of canal

1. This canal has a RCC Lining work in the bottom and sides.
2. In the stretch of canal, at village area only this canal has one side agriculture land that use for farming and other side have an WBM road in some portion and Unpaved road in balance area and both road are of 6 Wide for the movement along with canal. The protection work in the banks edges of canal is doesn't have any arrangement of high level permanent wall, or the fencing in the edges for any kind of protection.
3. The WBM Road crossing the canal with RCC Culvert Bridge that are provided in 2 location & one old Non-Functional Girder Foot bridge is present for the crossing for canal.
4. Population of village is around 8000 People.

5. Canal is damage in concrete lining work at many section in sloped portion and it is directly affecting the ground water quality and the strength of soil that provide stability to the nearby area house, bottom of canal is filled with garbage and contaminated water along the 1.7 KM Stretch of canal.
6. The bridge centre pier is blocked a consolidated garbage received from running water and over the bridge people activities, of volume 2 M3 approximately
7. This canal is flowing through This canal has dimension of 6 Mt Width at top x 2 M Width at bottom x 2 effective depth of canal that can be termed as trapezoidal RCC Canal.
8. The one side that have Road is have a consolidated garbage that mainly includes Packed plastic bag filled with home rubbish, dust, Excess balance food that come from daily home activities, plastic bags, dry leaves of tress etc. are mixed and throwed in canal water due to unavailability of garbage collection system in many homes and presently it is settling in the middle way of canal.
9. Other side of canal have thick unbalance tree plantation to obstruct the view of canal, where in some area it is covered by PCC for the household movement and to utilize the space for the colony settled near bank of canal.
10. The water has contaminated by many pollutants such as Sewage, garbage, leaves of tress, etc. and due to that this water cannot be usable for General works or irrigation work in canal and it will be not as effective for irrigation work.

IV. DISCUSSION AND RESULT

Naturally the water doesn't have any colour itself, but due to long run from the water shed travelling through many kilometre length in canal the water gets become little bit darker colour if it get contacted with any chemical or organic matter due to its nature of state, however it's capacity to regain its original colour due to settlement of heavy particles and low quantity of matter dissolved in water compared to its volume but to perform this process its required time, velocity, volume, and the most clean source of water, where in our study case the canal is near the end of its targeted CCA Area and the water that affected due to the process is not have further any sufficient length for settlement of sediments nor the type of settlement are type settle in water in natural state

During investigation the water colour is near to light black that is an alarm for the quality of irrigation water used for farming, at time of discussion with villagers we understood that water pipeline is available to them with pumping from the ground water but the TDS Value is much more higher and the taste of water is also salty that is affecting their body and overall health, the garbage collection facility is not readily available in entire village effectively and where the facility is not available those house are separate the dust and collect the house hold waste in plastic bags and throw it in canal, sewage disposal facility in village is done by water conveyance method in open channel and water outlet is the canal, at various location the level of open drains are maintained by gates that allow water into the canal, further the waste water from sink and bath are also merge in sewage water and flowed along with canal.

In time of rainy season the entire canal is flowing with its full capacity and carrying the pollution (All material in canal) and further carrying to the field channels and where the canal end in between farms like small ponds in the area, where they are unlined barred soil and the entire pond area and nearby ground water and soil is affected due to the pollution that settle in the base of pond also due to small area like that the cleaning of this type area is not maintained or tried to maintained but the effect is much more.

Results of this pollution in the village, irrigation area (CCA), and overall economy of states are will

1. Maintenance cost of canal, cost of farming is increased
2. Quality of canal water, ground water condition, CCA area, crop yield ratio is Reduced for farming
3. Soil further not able to grow different type of crops
4. Tons of Untreatable Pollution is mixed in water and gets stored in end of field channel between the CCA where it cannot easily cleaned
5. Health issue are increased due to mosquito beds development in the banks of canal due to pollution
6. Nearby industries are try to mix the untreated water and cannot easily traceable
7. When Animal, Birds & Creature situated along canal consume the low BOD, High PH Water they health complication issues are arrive and the Environment ecology get effected

What action need to be done to reduce the effect of canal pollute

1. Design of the canal alignment from outside the village area
2. Restriction imposed for new building that not have proper sewage connections near canal
3. Inspection by Government Field Officer for the supervision, Maintenance of canal and to have power for penalties to the culprits for the water pollution
4. Campaign to be done by NGO, Institutes for awareness of water scarcity and control for water pollution
5. Closing the illegal connection in canal and providing proper STP for the population near Canal
6. Where any proper garbage collection facility not available, need to provide a specific area/Method for collection of garbage that lead to restrict start of land of water pollution

V. CONCLUSION AND RECOMMENDATION

In light of the above study we come to the conclusion that the level of water pollution has reached to its alarming stage. The Municipal Corporation and Villagers are failed to maintain cleaning of the canal work, the main reason is an unplanned, illegal development allowed on the banks near canal, uncontrolled use of land and water of the canal, not maintaining time cleaning of canal infrastructure in required time, we have to understood the meaning of sustainable development meaning and must have to apply at every location by adopting proper planning of land, canal alignment and gate provision, providing sufficient Sewage Treatment Plant (STP), Effluent Treatment Plant (ETP), Proper Garbage Collection method from small to big area and in many more efficient ways.

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