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Different Quality Index of Irrigation Water From canal of Sone River

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Abstract- ***The purpose of this research was to examine the "Different quality index of irrigation water canal of Sone river." A canal is a man-made waterway dug to provide farms with irrigation supplies. The water is obtained from a lake, pond, river, or reservoir. In order to combat water erosion and seepage, canals may be constructed from concrete, brick, or a flexible stone. Irrigating land using a canal and associated irrigation system is a time-tested and cost-effective strategy. The height of the water canal intake diagrams. Irrigation systems in fields rely on water drawn from reservoirs, such as ponds and reservoirs, or river wells, which are pumped to the fields.***

Keywords- ***Irrigation water canal, Open canals, Main-Canal, Branch-Canal, and Sone River etc.***

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INTRODUCTION

Farming ensures the continued existence of the human race. A nation's agricultural sector is only one of many contributors to economic growth. India's agricultural sector has always enjoyed widespread attention and government backing. More damage has been done to water supplies because of the high pace of population increase and the transformation of agricultural land into homes. The farmer also has difficulties with things like soil erosion, crop choice, land fertility, the availability of competent labor, the quality of irrigation supplies, the dedication of organizations participating in the irrigation process, and so on. Because of the lack of alternatives and the pressing need to maximize the use of the limited water supply, farmers have prioritized irrigation in recent years. Water storage and irrigation systems are crucial to the prosperity of the agricultural sector. The quality of irrigation water varies greatly from one location or farm well to another. Knowing the chemical composition of Towers' water is crucial for predicting any issues that may arise from its use as irrigation. Irrigation via the SONE CANAL is crucial to agricultural progress in the Arwal district of Bihar. Rivers are also a significant and necessary supply of canal needed for the irrigation of crops in other parts of the state. However, modern civilization and a lack of fresh water management on the part of the nearby village have led to the pollution of irrigation water with various agents, such as heavy metals, pesticides, transported fertilizers, and so on.Since the government has taken it upon itself to improve the efficiency of irrigation by means of the "per drop more crop" project, the quality of irrigation water has declined.

In our part of Bihar, farmers use a man-made hydraulic pressure system that collects and delivers irrigation water from sources like canal dams and pound rivers via canals. It's common knowledge that man-made canals are essential for supplying water to many locations. Materials like concrete, etc., are often used to prepare human drainage for irrigation purposes. Or to fix problems with flexible materials' stability, including water seepage or soil erosion. The irrigation water comes from the river and storage facilities. The transportation network primarily benefits agriculture by facilitating the delivery of water from the intakes structure to the farmer ditches. In the course of the distribution network

The water is delivered via trenches constructed around the field edges. Normally, water transport is guaranteed.

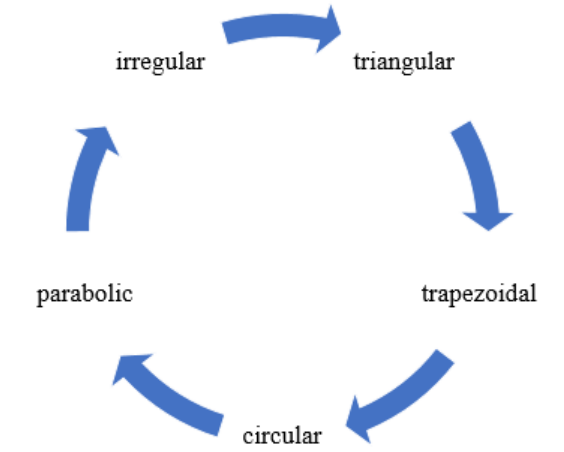
Transporting water within fields is guaranteed by canal systems. Water from rain and irrigation is channeled away from the fields by the drainage system. The irrigation system's front door is equipped with an intake structure. Its job is to channel water from the source (lake, river, reservoir, etc.) into the agricultural watering system.

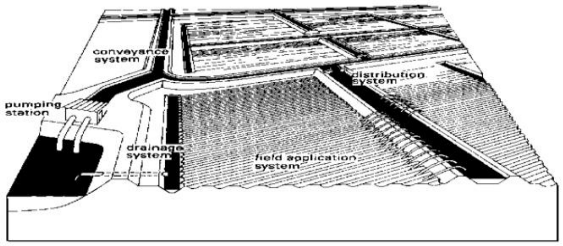
Transport and distribution infrastructure include: Locks and dams removed from canals

The whole irrigation system, including the canals used to carry water, is considered part of the conveyance and distribution system.

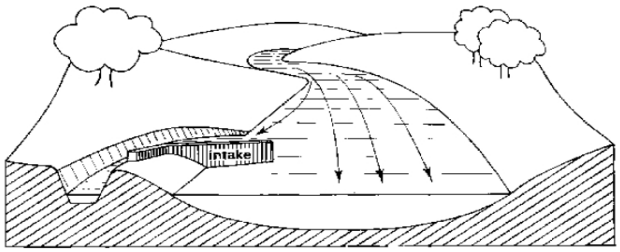
Canals wide open The phrase "open channel" is used to describe man-made waterways that are accessible to the public. In this context, canals and other bodies of water often mean the major waterways. To provide water for agricultural purposes. Field ditches have tiny proportions and Water for irrigation purposes should be available from the outset of cultivation.

Characteristics of Canals: Canals may be classed as either classed or Rectangular, according on the shape of their cross sections.





The water for irrigation can be sourced either directly from a river or from tanks and reservoirs.



The water is pumped from a central point and then diverted into a network of canals for distribution. Listed below are the many nodes that make up the distribution system for the canal irrigation system:

- **Main Canal**- More than 10 cumecs of water is flowing through the Main canals. It's the main canal in the system, and it carries water from the drainage canals to the intake. Importantly, direct irrigation via the main canal is not an option.
- **Branch Canal**- Between 5 and 10 cumecs is the typical discharge in the branch canals. The main canal's offshoots may go in either direction at consistent intervals. The branch canal serves as a conduit for irrigation water and as a source for both major and minor streams.
- **Major distributary**- Both the Main Canal and the Branch Canal provide water to the major tributaries. When compared to the production of the smaller branch canals, the larger distributary canals fall short. The largest distributary canals sometimes get their water supply straight from the main canal. These waterways are sometimes referred to by their other name, "irrigation canals," because of their function in delivering water to fields.
- **Minor Distributary**- Between 0.25 and 3 cumecs of water flow via the Minor Distributary Canals. These are used to collect water from the lateral drains. Faucets placed next to minor distributaries allow them to feed water to the courses.
- **Watercourse or Field Channel**- Less than 0.25 cumecs of water is flowing through the waterway or field channel. Depending on the scale of the irrigation project, the water source might be a big distributary or a small distributary. These use water from the main distributaries if there is a big amount of land that has to be watered. However, they use water from secondary canals to supply smaller regions.

The field may sometimes get its water supply straight from the branch canal. In particular, the canal irrigation system continues to shrink in size as one moves away from the main canal and toward the water course. The river's water is first sent via the main canal, then the branch canal, the major distributary canal, and finally the small distributary canal. It is then discharged into the Water Course and ultimately distributed to the playing field.

Canal Irrigation- A man-made hydraulic system, an irrigation canal is used to pipe water from a reservoir or river to distant communities. These canals are man-made waterways that help move water around for agricultural reasons. Durability issues like seepage and erosion may be addressed by constructing them out of materials like concrete, stone, brick, or flexible membranes. Irrigation water might come from a river or be stored in tanks and reservoirs.

How Canal Irrigation Systems Function The fields need a steady supply of water for irrigation,

therefore canals are dug to the proper depth and width. When planning canals, it's common practice to favor sections with a smaller wetted perimeter and higher discharge as an economic compromise. The canal irrigation systems finally distribute the water evenly over the cultivated lands. Depending on the size of the area, the amount of irrigation needed, and the general topography of the land, the water is channeled into the field either manually or via different irrigation systems when it reaches the targeted place. The terrain is sloped appropriately, allowing water to flow naturally. It's important to remember that the canal irrigation system's scale will mostly be determined by how much water will be used. The size of the canals is based on how much water is needed for irrigation.

The reduction of flood damage from canal irrigation systems is a boon to economic development. These contribute to the maturation of a desert landscape. The water table is not allowed to drop because to efficient canal irrigation systems. In addition to their role in the transportation sector, canals play an important role in the production of hydroelectricity, the expansion of fisheries, and the provision of drinkable water.

Water-borne infections may spread rapidly when insects, mosquitoes, and worms are constantly exposed to water, which is a major drawback of canal irrigation. Water scarcity and silt buildup are both possible outcomes of distribution inconsistencies. The buildup of salts and alkalis at the surface might make the soil unusable.

The Irrigation Canal of the Son River- The capacity of the canal may be severely reduced if it is not properly maintained, which leads to the accumulation of sediments in the canals. An effective canal irrigation system requires significant time and resources to build. Central India is traversed by the perennial Son River, often spelled Sone. The Son River is the Ganges' second-largest right-bank (southern) tributary, after the Yamuna River.

Geography of Son River:

OBJECTIVES

The goal of this study is to examine the physiochemical composition of Sone River water drawn from various blocks for the purpose of irrigation. The quantity of rain falling during the monsoon season is reducing as a consequence of the changing climate, and as a result, the river's water supply is also diminishing. Consequently, adequate water management is required to meet the need for irrigation. In order to determine the water's appropriateness for irrigation, a thorough analysis of the water's quality is required. Considering how crucial water is to the success of any agricultural endeavor. Long-term irrigation water appropriateness planning and other actions that farmers should take.

a) Identification highly contaminated area of irrigation water.
b) Removal of the work to the present day problems and need of society contribution to the existing knowledge.

METHODOLOGY

Collection of water sample 5 different locations (blocks) of Arwal district from irrigation field three times pre-monsoon, monsoon and post monsoon in a year. The collection of is done by following the procedure given by “Ministry Of Water Resources”.

HYPOTHESIS

To analysed the river water of Sone from different location (blocks) for their physiochemical contents for irrigation quality purpose.

RESULTS

Analysis of a water sample for various irrigation water quality indices. Three categories have been established for the irrigation of water based on the canal's parameters: A. The chemical property, (b). both biological and physical characteristics. These attributes pertain to irrigation and are related to water. As a result, the parameters—EC, TDS, SAR, alkalinity, and hardness—are used to determine the composition of minerals like salt in the water. The quality of irrigation may be assessed chemically.

To investigate the hypothesis that five distinct sites (blocks) in the Arwal district's irrigation field would provide water samples three times a year—pre-, during, and post-monsoon—.

The range and type of irrigation water for IWQI

IWQI	Water type
85-100	Excellent
70-85	Very Good
55-70	Good
40-55	Satisfactory
0-40	Unsuitable

The most important factors to determine the suitability of water use in agriculture are: Electrical conductivity→ PH→ Sodium and potassium Carbonate and bicarbonate in reaction with the Ca & Mg content → Turbidity → heavy metals, Free chlorine, Instrument to be used to collect data are → AAS, ICP, Specific compounds → COD Analyzer → BOD Analyzer etc.

EC and TDS readings are often used to assess the salinity of irrigation water. Working of Canal Irrigation (WCI) crops are irrigated with water from canals that are deep enough and wide enough to meet their needs. When planning canals, it's common practice to favor sections with a smaller wetted perimeter and higher discharge as an economic compromise. The canal irrigation systems finally distribute the water evenly over the cultivated lands. Depending on the size of the area, the amount of irrigation needed, and the general topography of the land, the water is channeled into the field either manually or via different irrigation systems when it reaches the targeted place.

CONCLUSION

According to the results, the Sone irrigation network is effective. The state government of Bihar has also been working on modernizing the state's irrigation system. Nothing has been done despite the passage of numerous years. As a result, the physiochemical contents of irrigation water samples from the Sone River at various locations (blocks) were referred to as a variety of water quality indices. Chemical characteristics, physical characteristics, and biological characteristics are the determinants of irrigation water quality. Bansagar Dam in Madhya Pradesh and the Rihand Dam on the Rihand River, not far from Pipri in Uttar Pradesh, are two examples of the country's most notable dams and hydroelectric projects. The Son River in Bihar is channeled via the Indrapuri Barrage and into the Sone Canal System, where it is used for irrigation. Arrah and Patna are connected by the oldest river bridge in India, the Koilwar Bridge, which was built in Bihar in 1862.

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