A STUDY ON IMPORTANCE OF WATER RESOURCES AND WASTE WATER MANAGEMENT

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Abstract

This paper presents water resources and waste water management system that are combinations of constructed water control facilities and natural, or environmental elements that work together to achieve water management. It covers aspects of water resources engineering from hydrology, hydraulics, and hydraulic structures to engineering economy studies and planning. It stresses the importance of water in human lives and in other species and addresses the problem of water scarcity developing countries. This paper argues that processes of social learning and the presence of informal actor platforms are of major importance when it comes to implementing and supporting integrated and socially, environmentally, and economically sustainable resource management regimes over extended periods of time. It shows applications of the basics to water supply, irrigation, hydroelectric power, river navigation, drainage, waste water collection, treatment and disposal, and flood control. Managing water for sustainable use and economic development is both a technical and a governance challenge in which knowledge production and sharing play a central role. Furthermore, a framework for improving the management of water resources is provided. The approach emphasizes that water policies and investments should be consistent with a long-term vision for development be it food security, health improvement, or environmental protection.

Key words: Water resources, water management control system, water engineering, etc.

1. Introduction

Traditionally, India has been endowed with large freshwater reserves, but increasing population and over exploitation of surface and groundwater over the years has resulted in water scarcity. India is the second largest water consuming country in the world. Natural water resource systems comprise sets of environmental or hydrologic elements in nature that include the atmosphere, watersheds, stream channels, wetlands, floodplains, aquifers and groundwater systems, lakes, estuaries, seas, and the ocean. It is noted that the majority of poor people are still without safe drinking water and adequate sanitation services, that 1 billion people lack an assured supply of good quality water, and that 1.7 billion have no adequate sanitation. Treated wastewater may be considered as a new water resource, which can be added to the general water balance of a region. This new source can substitute conventional water used for irrigation. Israel is presently reusing more than 65 per cent of the total domestic sewage production of the country. Sustainable management of water resources poses enormous challenges in many parts of the world. Despite the global abundance of water and the mainly renewable character of this resource, it is estimated that one-fifth of the world's population lives under conditions of water scarcity.

2. Water resources management

Water resource management is the activity of planning, developing, distributing and managing the optimum use of water resources. It is a sub set of water cycle management. It is like hydrology but the scale of management is low here. This field generally deals with measure to control flow of water. If one is designing these structures then he must know hydrological characteristics of that area. Sewage treatment generally involves three stages: primary, secondary and tertiary treatment. Primary treatment consists of temporarily holding the sewage in a quiescent basin where heavy solids can settle to the bottom while oil, grease and lighter solids float to the surface.

Water treatment: It is the process that makes water suitable for specific end use purpose. It may be drinking, irrigation etc. Treatment of water is containing excess fluorine.

Waste water treatment: It is the process through which water, which is no longer suitable for its use, can be converted back to effluent in minimum possible environmental damage. Waste water treatment is a process to convert waste water which is water no longer needed or suitable for its most recent use into an effluent that can be either returned to the water cycle with minimal environmental issues or reused.

Hydrology: It is field of engineering which tracks the journey water and deals with water cycle. For example, rainfall, infiltration, groundwater flow, water nutrients transport, etc. are few particular areas which come under hydrology.

Integrated water resources management has been defined by the Global Water Partnership as "a process which promotes the coordinated development and management of water, land and related resources. Water resource management is a very important issue from several angles such as development of water bodies for future, protection of available water bodies from pollution and over exploitation and to prevent disputes. Water management emphasis tends to shift from supply augmentation to limiting water consumption.

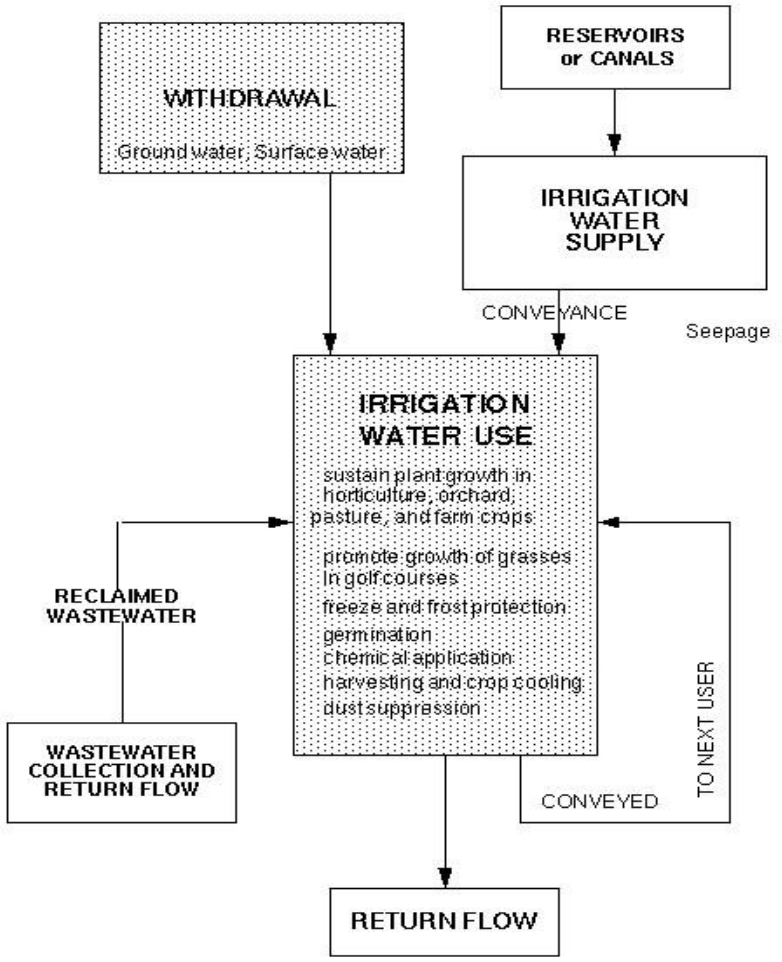
3. Importance of waste water management

The major aim of wastewater treatment is to remove as much of the suspended solids as possible before the remaining water, called effluent, is discharged back to the environment. As solid material decays, it uses up oxygen, which is needed by the plants and animals living in the water. There are two methods of cleaning water, chemically or by natural means. The water for drinking, bathing and washing is treated in a water treatment plant. Chlorine is added to the water to protect against any bacteria or other pollutants that may still be in the water. Surface freshwater is unfortunately limited and unequally distributed in the world. Structures such as dams may be used

to impound water for consumption. Dams can be used for power generation, water supply, irrigation, flood prevention, water diversion, navigation, etc. If properly designed and constructed, dams can help provide a sustainable water supply. Groundwater accounts for more than 50 per cent of global freshwater. Groundwater can be a sustainable water supply source if the total amount of water entering, leaving, and being stored in the system is conserved. Bottled water is a 21st century phenomenon whereby mostly private companies provide potable water in a bottle for a cost. In some areas, bottled water is the only reliable source of safe drinking water. However, often in these same locations, the cost is prohibitively expensive for the local population to use in a sustainable manner. Bottled water is not considered an improved drinking water source when it is the only potable source available.

4. Water in industry

Water is used in just about every industry. Industrial water withdrawals represent 22 per cent of total global water use. Its use is notable for manufacturing, processing, washing, diluting, cooling, transporting substances, sanitation needs within a facility, incorporating water into a final product, etc.



Consumptive use occurs as (1) evaporation from open reservoirs and conveyances and during application to plants, (2) evapotranspiration during plant growth, (3) product incorporation.

5. Water in agriculture

Agriculture uses the largest amount of freshwater on a global scale. It represents 70 per cent of all water withdrawal worldwide. In the United States, for example, agriculture accounts for over 80 per cent of water consumption. The productivity of irrigated land is approximately three times greater than that of rain-fed land.

6. Domestic water uses

The average household needs an estimated 20-50 liters of water per person per day, depending on various assumptions and practices. Reducing water use through waterless toilets, water efficient appliances, and water quantity monitoring, is an important part of sustainability for domestic water supply.

7. Conclusion

Our water resources, irregularly distributed in space and time, are under pressure due to major population change and increased demand. Engineering on waste water is a very important written support for all that who is interested in water management. Artificial recharge using source waters of impaired quality is a sound option where recharge in intended to control saltwater intrusion, reduce land subsidence, maintain stream base flows, or similar in-ground functions. It is particularly well suited for no potable purposes, such as landscape irrigation, because health risks are minimal and public acceptance is high. A water supply system will be sustainable only if it promotes efficiencies in both the supply and the demand sides. Initiatives to meet demand for water supply will be sustainable if they prioritize measures to avoid water waste. Avoiding wastage will contribute to reducing water consumption and, consequently, to delaying the need for new resources. Sustainable water supply involves a sequence of combined actions and not isolated strategies. It depends on the individual's willingness to save water, governmental regulations, changes in the building industry, industrial processes reformulation, land occupation, etc. The challenge is to create mechanisms of regulation, incentives and affordability to ensure the sustainability of the system.

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