ABSRACT

Water resources are national assets. Mismanagement and unplanned development of water resources have resulted into water crisis in our country Poor water availability becomes a severe constraint in food production, economic development and protection of natural systems. According to National Water Policy, water is a precious national resource to be planned, developed and conserved in an integrated and environmentally sustainable manner, keeping in view the needs of the states concerned

The futuristic demand of water resources for irrigation will be highly critical considering present scenario of withdrawals of surface water and ground water. The scarce surface water resources cause decrease in annual intensity of irrigation and thereby cause loss in economy due to insufficient agricultural production It is observed that excessive pumping of ground water for irrigation will cause decline in water table and results in decrease of ground water storage. If such trend continues, then it will cause undesirable mining of ground water, which is considered to be against the conservation standpoint.

In such crucial and critical situations, it is required to investigate alternate sources of water for irrigation e.g municipal sewage with a view to conserve surface water and ground water resources

It is observed that problems related to disposal of sewage increase with increase in population of city. An increase in population leads to rise in pollution load on natural water bodies Under the above circumstances, the use of sewage water for irrigation also paves way for efficient disposal of sewage i e domestic wastewater, which in turn has become bane for many municipalities and local bodies.

Sewage effluent can be promoted as alternative source for irrigation, organic matter and nutrient supply for crop production. The safe utilization of treated wastewater not only conserves surface and ground water resources but also helps in increasing agricultural production

Mere application of sewage does not save the situation. It is very important to look at the benefits as well as hazards of wastewater irrigation practices to public health and the environment

With a view to conserve surface and subsurface water resources and promote safe utilization of sewage effluent in agriculture, a series of experiments were conducted at the Campus of Nirma University of Science and Technology, Ahmedabad

In order to analyse environmental impacts of irrigation for Wheat and Green gram crops by blending sewage water with ground water and surface water, the experiment was designed with seven irrigation treatments having different blending ratios and three fertilizer treatments with varying levels of application of nitrogenous fertilizer.

Environmental impacts refer to qualitative and quantitative aspects of agricultural produce, soil salinity & toxicity, ground water contamination and public health With a view to analyse socioeconomic impacts with respect to availability and non-availability of wastewater for irrigation, the concerned respondents were interviewed in frank and friendly atmosphere. The distribution of beneficiaries and non-beneficiaries according to their education level, land holdings, crop production, cropping Intensity, herd milk production and public health was carried out

The various weightages we decided according to the conditional impact resulting in a least damage to human health and environment and scores under each conditional impact we worked out

The experiment for wheat production clearly shows that treatment T6N3 (33.3% sewage water & 66 6% surface water and 50% of recommended dose of nitrogenous fertilizer) ensures highest level of safety as far as consumption of wheat grains by humans is concerned and also saves 33 % of good quality of water resources (i e ground water and surface water) by blending municipal sewage with surface water for irrigation. Also, treatment T6N3 reflects saving in application of nitrogenous fertilizer by 50%.

It reveals through an experiment for green gram production that treatment T6N3 saves 33 % of good quality of water resources (i e ground water and surface water) by blending municipal sewage with surface water for irrigation and 50% of nitrogenous fertilizer with minimal environmental hazards.

The monitoring of various ground water samples represents no significant ground water contamination No symptoms of serious diseases are noticed in persons consuming food produced by wastewater irrigation.

As far as socioeconomic impacts are concerned, it was observed that the conditions of concerned villagers improved with the application of wastewater for irrigating crops

In developing countries, wastewater serves as a valuable resource for increasing irrigation potential particularly in arid and semi arid regions. Agricultural reuse of treated wastewater may play a significant role for management of water resources in semi arid areas