UTILITY OF WASTE WATER FOR FARMING USING ARTIFICIAL INTELLIGENCE

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Abstract: Majority of India is depended upon the agriculture and farming, the main resource for cultivating land is water, due to recent industrialization water in the rivers was polluted. To overcome from this polluted water for cultivation farmers need to take necessary steps. Owing to the lack of adequate awareness of cultivating agriculture fields with pure water, for irrigation purposes farmers are facing tremendous difficulty with industrial waste in rivers, due to huge increase of population and high utility of ground water leads to declining of ground water level. Water shortage is the major concern in the present days. Since river water is rendered more acidic by runoff from fields, hold's solvent waste minerals and salts with dangerous fertilizer nutrients due to the polluted water irrigation becomes hard, as a result crop cannot survive. To overcome from this problem in this paper we propose a model to purify the waste water for farming purpose using Artificial Intelligence and creating awareness among the farmers how Artificial Intelligence technology is used for irrigation of quality crop in the fields

***Keywords*: Water issue in agriculture, Farmer's problem related to water, pure water cultivation, pure water Irrigation.**

1. Introduction

Rainwater harvesting or reclamation is another way of practice for reducing the huge drinking water requirement, deploying the necessary steps to avoid the release of industrial waste water into the aquatic environment leads to quality water output, because of the nutrients it provides, recycled water can be advantageous for crops. The key macronutrients present in recycled water are nitrogen, phosphorus, and potassium and are considered ideal at some levels for irrigation. If the nutrient level in the reclaimed water is higher than the target level, the content of the reclaimed quality or purity of water may change or alter by extracting nutrients or combining with various other water sources, with the existing facilities to reuse water for agricultural irrigation would rely on various types of crops and its reclaimed water quantity, quality and its cost efficacy. In order to use recycled water for irrigation, existing facilities will have to be improved.

Water Reclamation:

Reclamation or Reclaimed water referred as reprocessed water, With the exception of human use, reprocessed water is usually safe and secure for various usages. Waste water from residential and industrial areas will be treated to remove impurities for making recycled water to recharge the ground level water Wastewater is highly engineered for protection and reliability in order to make recycled water quality more predictable than many current sources of surface and groundwater. When suitably used, recycled water is considered clean. The main goal of reprocessed water is to recharging aquifers and can be used to drinking purposes.

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Water Reclamation Process:

- The removal of sand and debris by screens and other processes
- Sedimentation separates large solids from sedimentation
- Organic materials are broken down by microorganisms
- Clarifiers extract microorganisms and solids that remain
- Filtering renders transparent water
- Disinfection destroys the remaining microorganisms, normally with chlorine.

To make sure that reclaimed water is good in quality, reuse facilities are continuously monitored and deployed as pathogen-free in essence.

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Supply of Reclaimed Water to the Distribution Plant:

In the treatment plant the waste water was recycled and reaches to distribution system. In double length pipe network which holds reprocessed water in pipes entirely different from small water pipes, reprocessed water is distributed.

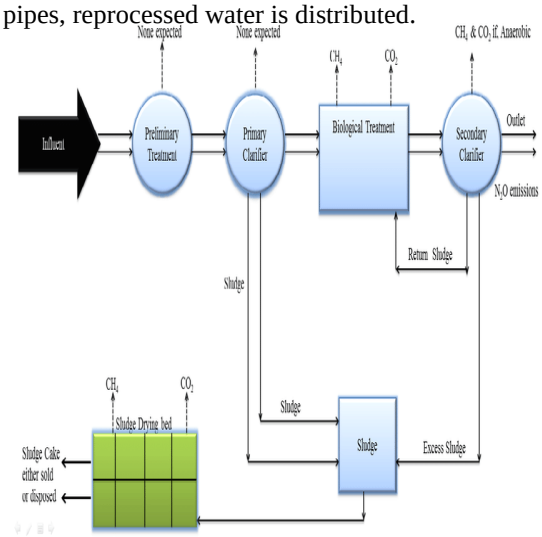

Fig 1: Supply of Reclaimed Water to the Distribution Plant

Recovery of Maximum Water:

There are different techniques developed by researchers to assess optimum water recovery; Pinch Analysis is also called as maximum water reprocessed or reclamation. The main aim of this technique to comfort user from attainable amount of utilization of fresh water and possible water wastage. It provides the guidelines for users to use, in developing a water model system.

High-level therapy requires more reduction of removal and disintegrated solids, including:

- Removal of nutrients like nitrogen or phosphorus by biotic or chemical techniques.
- Removal of carbon adsorption's like organics, metal components.
- Further removal of "filtration, coagulation, ion exchange, reverse osmosis" and other methods of suspended and dissolved solids.
- On using "ozone oxidation/ hydrogen peroxide", organic chemicals will be removed.

Restored water is sterilized until it is released by advanced treatments. It also requires treatment than effluent release to rivers, as consumers usually have more direct interaction than undiluted effluent with undiluted reclaimed water.

Considerations of Reclaimed Water:

While we using reprocessed water for irrigation purpose the quality of water is the major concern to notice. The following properties are important for the quality of plants, soil, health and the climate. The most critical factor in deciding whether water is appropriate for reuse is possibly salinity, or salt concentration, due to heavy concentrations of salts in water is the number of elemental ions ("e.g., sodium, calcium, chloride, boron, sulphate, nitrate") and is typically calculated by determining the water concentration of Electrical Conductivity (EC, units = ds/m) or Total Dissolved Solids (TDS, units = mg/L). Usually, water with a 640 mg/L TDS concentration would have an EC of approximately 1 ds/m.

The salts in recycled water are extracted from:

- Elemental ions that are present naturally in water.
- 'Ions', stored during water treatment in dissolved form following solid separation.
- Any salts applied during the process of water treatment

A bit saline ("TDS ≤ 1280 mg/L or EC ≤ 2 ds/m") is much of the reclaimed water from urban areas. By decreasing the osmotic ability of the soil, high salt concentrations limit the water uptake of plants. Residential use of water, for instance, adds approx. Dissolved salts of 199-400 mg/L (Lazarova et al., 2004a). In their reaction to the amounts of salt, plants vary. The salinity of the specific recycled water supply must be calculated by that it is possible to choose the necessary crops and/or application rates. Most turf grasses can tolerate water with soluble salts of 199-800 mg/L, but toxic salt level may be more than 1950 mg/L (Haryanvi, 2004). Further more details on turfgrass management when irrigating saline water see Carrow and Duncan. Various other different crops and landscape plant's are highly sensitive to soluble-salt levels than turf grasses and should be managed as sodium, chloride and boron concentrations.

The levels of Nutrients:

Usually, recycled water combination of huge amount of phosphorus (P) and nitrogen (N) than drinking water, to deploy the estimated irrigation volume ' N' and 'P' concentration in the water, the amount of 'N' and 'P' given by the recycled water can be determined. The Legislation on reprocessed water and reuse needs the nutrient management, plan to be listed for the high volume use of untreated recycled water to achieve "biological nutrient removal" (BNR). low concentrations of 'N' and 'P' is required in BNR treatment process, it illustrates the meaning that recycled water can be applied at rates enough amount to supply the water requirements of a crop without the possibility of infection of the underground water.

Risks in Health:

During the process of investigating and analyzing food crops, while using reclaimed water in irrigation risk and effect of consequence can be measured which includes raw vegetables, it was found that viruses free was recorded on every samples of crops cultivated with reclaimed/reprocessed water from experimental sites. In addition to this the differences between well water irrigation or cultivation crops and reclaimed-water-irrigated crops, the level of bacteria that occurs naturally were

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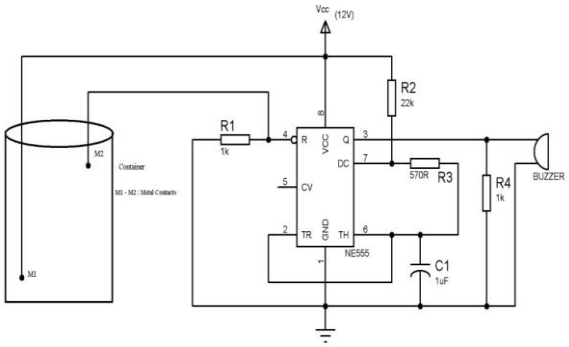

Fig 2: Digital Water level Indicators

not significant different farmers were also unable to detect any adverse health effects from exposure to recycled water components. In this regard the quality of yielding and longevity of crops cultivated by reprocessed or reclaimed water is fully equal to the crops irrigated with well water.

Drinking Water Indicators:

A list of the metrics often assessed by situational categories is as follows:

- Alkalinity
- Water color
- pH
- Odor and taste ("geosmin, 2-Methylisoborneol (MIB), etc.")
- Dissolved metals as well as salts ("sodium, chloride, potassium, calcium, manganese, magnesium")
- Microorganisms such as "Cryptosporidium, Giardia lamblia and fecal coliform bacteria" (Escherichia coli).
- Dissolved and metalloid metals ("lead, mercury, arsenic, etc.")
- Organics dissolved: Colored Dissolved Organic Matter (CDOM), Organic Carbon Dissolved (DOC)
- Radon
- High metals
- Pharmacy goods
- Hormone analogs

Digital Water level Indicators:

The water level indicator identifies what the water level in the field is. These automated indicators of water level are often used in boilers.

Implementation of Software in treating Wastewater:

Computer software is a set of software programs and associated information that illustrates a computer with set of protocols on what kind of instruction to performed and how the instruction to be performed. Programs are group of series of protocols in a specific sequence to alter the state of the machine. Program software carries out the purpose of the program it implements, either by supplying the computer hardware with instructions directly acting as input to another part of software. Executable code at the lowest level consists of instructions in machine language unique to an individual processor. A computer language consists of groups of binary values that indicate processor instructions that alter the state of the machine from its previous state. It is mostly written in high-level programming languages that are simpler to use and more accurate (closer to natural language) for humans than machine language. High-level languages are compiled into object code in machine language.

Implementation of software technology in waste water treatment plants: -

It is simple to trace out by adopting software technology in recycled water distribution plants: -

- What is the Characters of water?
- The volume of "waste water" that reaches the treatment plant?
- How much quantity of waste present in the water?
- What kind of valuable minerals in recycling that do not remove current ones?

Adopting the new computer techniques to this issue makes the operation of agricultural farmers easier: -

Waste water is processed in reclaimed water distributed plants according to the feasible quality use of agricultural fields. We can measure how high the intake should be with the aid of the reprocessed distributed treatment plant (water). what amount of water level can be managed during the year via the recycled distributed treatment plant using the new computer technology to do these things?

We may obtain precise results by accepting software technology. Water level indicator and water quality detector, both can attach with the assistance of software programming. on integrating these devices with artificial intelligence technology farmers can correct readings based on the one time:

1. What is the field's length and breadth?
2. How much is needed for water quality?.
3. What are the levels of water that will be retained in the field?

This allows farmers to properly handle waste water and, with the aid of the new computer technology, can help solve their problems.

2. Conclusion:

The major goal is the convenience of farmers when they are rising, making them free from stress from waste water use. With software, farmers may reduce their problems to some degree.

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