

# An Overview on Methods of Waste Water Management and Its Reuse for Agriculture Sector

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**Abstract – Wastewater treatment and reuse isn't new, and learning on this point has developed and progressed all through human history. Reuse of untreated city wastewater has been polished for a long time with the target of redirecting human waste outside of urban settlements. Moreover, land use of residential wastewater is an old and regular practice, which has experienced diverse phases of improvement. This has prompted better understanding of procedure and treatment innovation and the inevitable advancement of water quality standards. Wastewater is water whose physical, compound or biological properties have been changed because of the presentation of specific substances which render it risky for certain reasons, for example, drinking. The everyday exercises of man is fundamentally water subordinate and along these lines release 'squander' into water. In this article different aspect of Waste water management, methods to make them reusable and their use for agricultural purposes.**

**Keywords: Waste Water Management, Reuse, Agriculture etc.**

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## I. INTRODUCTION

Toward the start of the 21st century, the world faces a water quality emergency coming about because of consistent populace development, urbanization, land use change, industrialization, sustenance generation rehearses, expanded expectations for everyday comforts and poor water use practices and wastewater management systems. Wastewater management (or the scarcity in that department) directly affects the biological diversity of aquatic ecosystems, upsetting the key uprightness of our life emotionally supportive networks, on which a wide scope of segments, from urban improvement to sustenance generation and industry, depend. It is fundamental that wastewater management be considered as a feature of an incorporated, full life cycle, ecosystem-based management framework that works over each of the three elements of reasonable improvement (social, financial and environmental), and land fringes, and incorporates both freshwater and marine waters.

The concoction business is of significance as far as its effect on the earth. The wastewaters from this industry are commonly solid and may contain toxic contaminations. Concoction mechanical squanders more often than not contain natural and inorganic

issue in differing degrees of focus. It contains acids, bases, toxic materials, and matter high in biological oxygen demand, color, and low in suspended solids. Many materials in the concoction business are toxic, mutagenic, cancer-causing or essentially scarcely biodegradable. Surfactants, emulsifiers and oil hydrocarbons that are being utilized in substance industry diminish performance effectiveness of many treatment unit tasks. The best methodology to clean profoundly contaminated and toxic mechanical wastewater is when all is said in done to treat them at the source and here and there by applying nearby treatment inside the creation lines with reusing of treated effluent). Since these squanders contrast from residential sewage as a rule qualities, pretreatment is required to deliver an equal effluent. In substance industry, the high fluctuation, stringent effluent licenses, and outrageous working conditions characterize the act of wastewater treatment.

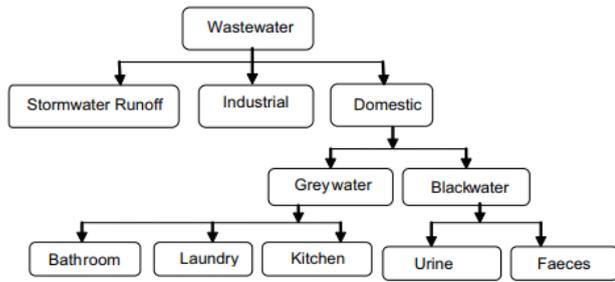


Figure 1: Types of Wastewater

## II. PARAMETERS OF NATURAL WATER AND WASTEWATER

Natural water can be isolated into two classes: surface water, for example, waterways and streams (Moorland surface waste) downpours, natural lakes, supplies, lakes (lowland surface drainage) and underground water, for example, springs and ground water. The structure of natural water is dictated by an arrangement of physical compound and bio-chemical procedures which happen amid various stages in hydrologic cycle. Atmospheric operators assume a functioning job in these procedures. Hence the quality of natural water is extraordinarily impacted by atmospheric conditions and regular varieties in temperature, as, the water in bowls with a low renewal rate.

## III. AEROBIC AND ANAEROBIC WASTEWATER TREATMENT

Aerobic, as the title proposes, implies within the sight of air (oxygen); while anaerobic methods without air (oxygen). These two terms are straightforwardly identified with the sort of microbes or microorganisms that are engaged with the debasement of organic impurities in a given wastewater and the working states of the bioreactor. Consequently, aerobic treatment forms occur within the sight of air and use those microorganisms (additionally called aerobes), which utilize molecular/free oxygen to acclimatize organic impurities for example convert them in to carbon dioxide, water and biomass. The anaerobic treatment forms, on other hand occur without air (and consequently molecular/free oxygen) by those microorganisms (additionally called anaerobes) which don't require air (molecular/free oxygen) to acclimatize organic impurities. The last results of organic digestion in anaerobic treatment are methane and carbon dioxide gas and biomass.

Aerobic, as the title proposes, implies within the sight of air (oxygen); while anaerobic methods without air (oxygen). These two terms are legitimately identified with the kind of microscopic organisms or microorganisms that are associated with the corruption of organic impurities in a given wastewater and the working states of the bioreactor. Hence, aerobic treatment forms happen within the sight of air and use those microorganisms (additionally called

aerobes), which utilize molecular/free oxygen to acclimatize organic impurities for example convert them in to carbon dioxide, water and biomass. The anaerobic treatment forms, on other hand happen without air (and along these lines molecular/free oxygen) by those microorganisms (likewise called anaerobes) which don't require air (molecular/free oxygen) to absorb organic impurities. The last results of organic digestion in anaerobic treatment are methane and carbon dioxide gas and biomass.

## IV. OBJECTIVES OF WASTEWATER TREATMENT

Wastewater treatment is exceptionally important for the previously mentioned reasons. It is progressively essential for the:

- √ Decrease of biodegradable organic substances in the environment: organic substances, for example, carbon, nitrogen, phosphorus, sulfur in organic issue should be separated by oxidation into gases which is either discharged or stays in arrangement.
- √ Decrease of nutrient focus in the environment: nutrients, for example, nitrogen and phosphorous from wastewater in the environments improve water bodies or render it eutrophic prompting the growth of algae and other aquatic plants. These plants exhaust oxygen in water bodies and this hampers aquatic life.
- √ Disposal of pathogens: organisms that reason illness in plants, animals and humans are called pathogens. They are otherwise called micro-organisms since they are exceptionally little to be seen with the bare eye. Instances of micro-organisms incorporate microbes (for example vibro cholerae), infections (for example enterovirus, hepatitis A and E infection), fungi (for example candida albicans), protozoa (e.g entamoeba histolytica, giardia lamblia) and helminthes (for example schistosoma mansoni, asaris lumbricoides). These micro-organisms are discharged in substantial amounts in defecation of contaminated animals and humans.
- √ Recycling and Reuse of water: Water is a rare and limited asset which is regularly underestimated. In the last 50% of the twentieth century, populace has expanded bringing about weight on the effectively rare water assets. Urbanization has additionally changed the agrarian idea of many zones. Populace increment implies more nourishment must be developed for

the developing populace and horticulture as we probably am aware is by a wide margin the biggest client of accessible water which implies that economic growth is setting new demands on accessible water supplies. The fleeting and spatial circulation of water is likewise a noteworthy test with groundwater assets being overdrawn. It is consequently that recycling and reuse is vital for supportability.

#### 4.1 Challenges faced in Waste Water Management

Wastewater management however not in fact troublesome can once in a while be looked with financial challenges. A couple of the challenges are examined underneath.

- √ Contamination of water sources: Effects of wastewater effluent on accepting water quality is huge, it changes the aquatic environment in this manner hinders with the aquatic ecosystem. The sustenance we eat contains carbonaceous issue, nutrients, follow components and salts and are contained in urine and defecation (black water). Medications (drugs), chemicals and as of late hormones (contraceptives) are additionally released into the wastewater treatment plant. Release rules must be carefully clung to. This will guarantee maintainability of water hotspots for children.
- √ Infrastructure: Most regularly than not, wastewater infrastructure are not the need of most government officials and consequently almost no venture are made. It is anyway imperative to consider wastewater infrastructure as similarly critical as water treatment plant in light of the fact that practically all the water created winds up as wastewater.
- √ Sludge generation: Treatment of wastewater results in the creation of sewage sludge. There must be a solid transfer strategy. In the event that it must be utilized in farming, at that point the dangers included must be thought about. Because of the nearness of heavy metals in wastewater, it is at times expected that agricultural use may prompt collection of heavy metals in soils in this manner tainting of yields.
- √ Reuse: Effluents which satisfy release guidelines could be utilized for agricultural purposes, for example, aquaculture or for irrigation of farmlands. The test anyway is that if wastewater treatment plants are not managed and consistently observed to guarantee great effluent quality, reuse winds up dangerous.

- √ Decision of suitable technology: Because the economy of most creating nations is contributor driven, assets for wastewater plants are essentially from donors. Thus, they will in general propose the technology which ought to be embraced. Thus, when the recipients, assume control over the office, its management of the tasks and upkeep of parts become very testing as the specialized ability, control necessities and so on are not economical.

#### V. METHODS FOR WASTE WATER TREATMENT

The different techniques are accessible for the treatment of risky waste.

- Physical method: physical treatment process incorporate gravity detachment , stage change framework, for example, Air steam depriving of unpredictable from fluid waste , adsorption, turn around assimilation, particle trade , electro dialysis.
- Chemical method: Chemical methods ordinarily went for changing the risky waste into less perilous substances utilizing strategies, for example, P H balance, oxidation or decrease and precipitation.
- Biological methods: Biological treatment method utilized microorganisms to corrupt organic toxin in the waste stream.
- Thermal methods: Thermal decimation process that are regularly utilized incorporate cremation and pyrolysis burning is winding up progressively favored choice in pyrolysis the waste material is warmed without oxygen to achieve chemical decay.
- Fixation/immobilization/adjustment systems included the dewatering the waste and setting the staying material by blending it with balancing out operator, for example, Portland cement or pozzolanic material, or vitrifying it to make a lustrous substance. For unsafe inorganic sledges, cementing process is utilized.

Energizing methods can be connected to both shallow and profound waters; natural water can be utilized just as cleansed wastewater gave that all the vital insurances have been taken and intensive looks at conveyed. Whenever cleansed wastewater is utilized, the refining procedure should concentrate for the most part on the evacuation of suspended solids, the demolition of toxic solutes and on the microbiological solids. The sort of

tertiary treatment important will depend not just on the quality of the purged sewage and the chose bolstering framework, yet additionally on the quality of the ground and of the aquifer and consequently on the framework 'limit with regards to natural refinement, particularly where organic and inorganic micro-organisms and disintegrated solids are concerned..

### 5.1 Levels of wastewater treatment

There are three wide dimensions of treatment: primary, secondary and tertiary. Now and again, preliminary treatment goes before primary treatment.

- ▶ Preliminary treatment: expels coarse suspended and grits. These can be expelled by screening, and grit chambers individually. This improves the activity and upkeep of ensuing treatment units. Stream estimation gadgets, frequently standing-wave flumes, are vital at this treatment organize.
- ▶ Primary treatment evacuates settle able organic and inorganic solids by sedimentation and drifting materials (rubbish) by skimming. Up to half of BOD<sub>5</sub>, 70% of suspended solids and 65% of oil and oil can be expelled at this stage. Some organic nitrogen, organic phosphorus, and heavy metals are likewise expelled. Colloidal and broke up constituents are anyway not evacuated at this stage. The effluent from primary sedimentation units is alluded to as primary effluent).
- ▶ Secondary treatment is the further treatment of primary effluent to expel lingering organics and suspended solids. Additionally biodegradable broke down and colloidal organic issue is evacuated utilizing aerobic biological treatment forms. The evacuation of organic issue is when nitrogen mixes and phosphorus mixes and pathogenic microorganisms are expelled. The treatment should be possible precisely like in streaming channels, actuated sludge methods pivoting biological contactors (RBC) or non-precisely like in anaerobic treatment, oxidation trench, adjustment lakes and so on.
- ▶ Tertiary treatment or advance treatment is utilized when explicit wastewater constituents which can't be evacuated by secondary treatment must be expelled. Advance treatment evacuates critical measures of nitrogen, phosphorus, heavy metals, biodegradable organics, bacteria and infections. Two methods can be utilized successfully to channel secondary effluent— traditional sand (or comparable media) channel and the more up to date film

materials. A few channels have been improved, and the two channels and layers likewise expel helminthes. The most recent method is plate filtration which uses huge circles of fabric media joined to pivoting drums for filtration (FAO, 2006). At this stage, sterilization by the infusion of Chlorine, Ozone and Ultra Violet (UV) illumination should be possible to make water fulfill flow worldwide guidelines for agricultural and urban re-use.

## VI. WASTEWATER REUSE IN AGRICULTURE

Irrigation with wastewater is both transfer and use and for sure is a successful type of wastewater transfer (as in moderate rate land treatment). In any case, some level of treatment should regularly be given to crude metropolitan wastewater before it very well may be utilized for agricultural or landscape irrigation or for aquaculture. In many industrialized nations, primary treatment is the base dimension of pre-application treatment required for wastewater irrigation. It might be viewed as adequate treatment if the wastewater is utilized to irrigate crops that are not devoured by humans or to irrigate orchards, vineyards, and some handled food crops. Nutrients in civil wastewater and treated effluents are a specific favorable position as supplemental fertilizers. Achievement in utilizing treated wastewater for crop creation will generally rely upon receiving fitting techniques went for advancing crop yields and quality, keeping up soil efficiency and defending the environment. A few choices are accessible and a mix of these options will offer an ideal answer for a given arrangement of conditions. The client ought to have earlier data on effluent supply and its quality. Wastewater effluent can be mixed with ordinary water or exclusively utilized. Heavy metal focuses in streams utilized for irrigation in and around urban focuses, for example, Accra and Kumasi have been some of the time observed to be past prescribed dimensions for irrigation purposed and ought to in this manner may represent a wellbeing concern. Nations must create standards in compatibility with the WHO rules and uphold it.

## VII. CONCLUSION

Wastewater treatment inquire about which can possibly propel protected, solid, and financially savvy innovations to reuse effluents ought to be a worldwide need. Rising advances, for example, on-line sensors with continuous criticism will surely assume a noteworthy job in water reuse sooner rather than later. Wastewater is and will dependably be with us since we can't make do without water. At the point when water provided is utilized for the various human exercises, it winds up contaminated or its attributes is changed and in

this way progressed toward becoming wastewater. Wastewater can and should be treated to guarantee a sheltered environment and encourage public health. There are regular and non-traditional methods of wastewater treatment and the decision of a specific method ought to be founded on variables, for example, qualities of wastewater whether it from a region or industry (chemical, textile, pharmaceutical and so forth.), specialized ability for task and support, cost suggestions, control prerequisites among others. Broad research action in this field has prompted critical improvement and broadening in the procedures and methods utilized for waste-water treatment and sludge management. It is commonly perceived that the principle economic weight related with water contamination is the impact of contamination on health elective methods can be utilized to additionally treat or circulate the treated effluent. Because of persistent increment in its demands, fast increment in populace and expanding economy of the nation we need some propelled all around prepared and minimal effort and effectively generable strategies.

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