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Theme:
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COMPILATION OF ABSTRACTS

City Campus - Karunya, P.N.Palayam, Coimbatore, Tamil Nadu

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GENERATION OF BIOELECTRICITY FROM WASTE WATER AND COW’S URINE

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Microbial fuel cells (MFCs) are devices that can use bacterial metabolism to produce an electrical current from a wide range of organic substrates. Microbial fuel cells (MFCs) represent a completely new long term, affordable, accessible and eco-friendly approach to waste water treatment with production of sustainable energy. The open circuit potential was determined and the maximum voltage was estimated. We got a highest value of 1.4mA, 0.24V and 1.20mA, 0.24V by using Waste water with Mediator and without mediator respectively and 0.53mA, 0.878V and 20mA, 1.35V by using Cow’s urine with salt bridge and without salt bridge respectively, using this technology primary treatment of wastewater was also done and the tests revealed the reduction of BOD (Biological Oxygen Demand) and COD (Chemical Oxygen Demand). We are also successful in isolating in the electrogenic Pseudomonas aeruginosa.
ELECTROCOAGULATION PROCESS FOR TREATING
WASTE WATER
FROM TEXTILE INDUSTRIES

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Textile industry is found to be one of the most water polluting industries in India as various types of dyes and chemicals are used for the processing. There are various techniques such as physical, chemical, biological, advanced oxidation and electrochemical used for the treatment of textile industry effluents. These commonly used conventional treatment processes are time consuming, need large operational area requires more chemicals inquires more cost and are not effective for effluent containing toxic elements and dyestuffs. Moreover some processes are slow and generates large amount of sludge. The disposal of sludge becomes a problem again and needs separate care to avoid secondary pollution. Electrocoagulation in recent times attracted attention as a potential technique for treating textile effluents due to its efficient cost and environmental friendly process. The main aim of this study is to find the efficiency of electrocoagulation process in the treatment of textile dye waste water using iron electrode. The major operating parameters considered for the study includes the applied current, operational time, pH maintained during the reaction, concentration of the dye solution and the electrolyte concentration. At 120mA applied current, 30 minutes reaction time, NaCl as electrolyte with 3% and at pH of 7 the colour removal efficiency was found to be 100 %. The COD removal also showed good result. The treated effluent was analysed using FTIR and the total organic carbon was observed using TOC analyser. Electrocoagulation process showed good results and proved to be an efficient process for the treatment of textile dye waste water.

INTELLIGENT POLLUTION MONITORING USING GSM

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Pollution affects the health of the living beings, in order to reduce it we must detect the pollutant in particular areas. The aim of our project is to detect the pollutants by using sensors, which will detect the pollutants of air, water and human interference in the restricted areas and to give an alert message to the controller. If the controller doesn’t take any proper action to reduce the pollutants level within the given duration then the alert message will be send to the CPCB (Central Pollution Control Board) through the GSM. The values are captured by the sensors and it will be given to the Arduino Board and the data are transmitted wireless by using Zigbee module. If the value exceeds the threshold value a message will be automatically sent to the controller by GSM.
GROUNDWATER QUALITY ASSESSMENT OF PERUNDURAI REGION

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This paper deals with the ground water assessment of Perundurai region, which is polluted by various dyeing industries present in that region and the possible remedy for rehabilitating it. The way in which the samples for assessment are collected and how the results of those samples are compiled using GIS is also discussed here.

The way in finding the critical areas where the ground water is not feasible to be consumed is explained in detail. It also deals with the way GIS is effectively used to identify the points where artificial recharge has to be done to increase the quality of water. Finally, the construction and maintenance of the recharge pit is also discussed in detail.

TREATMENT OF DOMESTIC WASTEWATER IN AN UPFLOW ANAEROBIC PACKED BED REACTOR (UAPBR)

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The study was related to the possibility of using Upflow Anaerobic Packed Bed Reactor (UAPBR) applied to the treatment of domestic wastewater. The effect of Hydraulic Retention Time (HRT) ranging from 12 to 48 hrs and different organic loading rate (OLR) on the performance of the reactors were made.

Laboratory scale continuous UAPBR reactor made of Acrylic fibre was used in the present study. The reactor had an internal diameter of 120mm and height of 600mm resulting in total volume of 6.780 liters and bed volume of 5.99 liters. Gas collecting tank was separately designed with 250mm height & 80mm diameter.

The purpose of packing media is to retain solids inside the reactor, by the biofilm formed on the surface of the medium. The packing media used in the study were coarse aggregate media of rough surface which can retain more biomass on surface. The size of the aggregate is 8mm.

Domestic wastewater generated from PSG IMS, Coimbatore, Tamil Nadu was used as the substrate.

The inoculum was prepared using horse dung. To begin with, the reactor was seeded with the inoculum a mixture of horse dung slurry at 24hrs HRT and left standby for 21 days. After the start-up period the bioreactor was fed with various OLR for different HRT.

The experiments were performed at hydraulic retention times of 48, 36, 24 16 and 12 hrs based on empty reactor volume and the performance of the reactor was evaluated based on the removal of organic matter. The average COD removal efficiencies for domestic wastewater were 65.6 to 95.9 %, pH changes from 8.35 to 6.41. The relationship between the organic removal rate and HRT was linear at flow rates of 1.57 ml/min to 8.32 ml/min.
THE DETERMINATION OF LIMITING CURRENT DENSITY AS A FUNCTION OF CONCENTRATION AND FLOWRATE

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Limiting current density is considered as one of major factors in the design of an electrodialysis unit. The effect of limiting current density as a function of concentrations, flow rate, temperature and spacer geometry were studied. Varying concentrations of 1g/l, 8g/l, 15g/l were studied to a different flow rate of 20 l/hr, 40 l/hr, 60l/hr and 100l/hr. The experiments were also done with elevated temperature of 32° and 40°. The studies were done in two different spacer geometry, woven and non-woven. The studies show that the concentration is linearly varying and limiting current vary with the flow rate and temperature. Woven showed a higher rate of limiting current density. From these studies the major factors which affect the limiting current density was found out.

FATE OF MODEL ORGANIC CONTAMINANTS IN THE REVERSE OSMOSIS FILTRATION PROCESS

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Reverse osmosis (RO) membrane is an excellent barrier for most dissolved inorganic and organic species in water solution and therefore it has been extensively used for various water treatment and purification. RO process possesses many advantages over the conventional water treatment and purification processes, such as high product water quality, multi-pollutants removal, and small footprint.

The GE Osmonics Cell and RO AG1600 membrane were used in all experiments conducted in this study. In all the experiments, the inflow rate is kept constant at 2.0 l/min. Salt rejection and TOC rejection of the membrane and the effect of addition of different contaminants were investigated in a wide range of transmembrane pressure. Because of time constraint, the rejection experiments were conducted only for the salt of sodium chloride and contaminants such as Glucose and Humic acid in water solution. The results showed that the rejection of these salts by the RO membrane increased with transmembrane pressure, which is generally agreeable with previous experiments.
WATER AUDIT: AN EFFECTIVE TOOL FOR WATER MANAGEMENT (CASE STUDIES)

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Water Audit study is a qualitative and quantitative analysis of water consumption which helps efficient water utilization & conservation of water. In this present scenario, due to high water consumption, non-availability of fresh water, high water bills etc., there is an urgent need for the effective management of water resources. There comes the role of water audit which is an effective tool for water conservation and management. Water Audit determines the amount of water lost from a distribution system and the cost of this loss to the utility. Water audit helps to track the point of water wastage, leakages etc. and thereby measures can be taken to reduce water wastage and unnecessary usage and can save money. Water audit consists of different steps which includes surveys, power measurement of Pumps/Motors, preparation of Water Balance Diagram, establishing Water Consumption Pattern, evolving value added “cost of water” at various locations, detection of potential leaks & water losses in the system, determining key opportunities for water consumption reduction, reuse & recycle with paybacks etc. Water audit can be conducted for office buildings, apartments, hospitals, hotels, schools etc. Here we are presenting the entire process or methodology of a water audit through two case studies which have done in two different residential apartments in Kerala. It gives a clear idea about the water audit, its importance and various steps involved in conducting a water audit.

Assessment of Fluoride content in groundwater in Coimbatore Corporation East Zone

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Water is the precious gift of nature, the most vital factor for sustaining life although it does not contain considerable amount of nutrients. As the rainfall is mostly confined to monsoon season and it is unevenly distributed, our country is affected by frequent droughts. In order to overcome drought, people have found to use groundwater for drinking and other purposes. In Coimbatore the major source of water for drinking purpose is suryanadi and pillur. As the population and pollution has been increased tremendously, people have started to depend on groundwater for domestic purposes. Groundwater contains various parameters. When these parameters exceed their desirable limit they tend to cause serious health problems. One such parameter is fluoride content. Increase in fluoride content causes fluorosis. Fluorosis is the condition that affects the teeth by causing permanent marks in the teeth and skeletal fluorosis makes the bone ductile thus making the bones prone to fractures. Therefore it is very essential to assess the water quality in groundwater. Coimbatore Corporation consists of five zones- north, south, east, west and central. Nearly 20 water samples have been collected from various borewells in Coimbatore Corporation East Zone using random sampling technique. These sample samples has been analysed for fluoride content by SPADNS method using Spectrophotometer. The result was found to be in the range of 0.69 to 1.57mg/l. According to BIS, 1.00mg/l is the desirable limit and 1.5mg/l is the maximum permissible limit. From the results, almost all the places have fluoride concentration beyond the desirable limit. GIS mapping of these samples is in progress.
**HEAVY METAL ADSORPTION USING TOBACCO ASH**

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Adsorption is the adhesion of atoms, ions or molecules from a gas, liquid, or dissolved solids to a surface. This process is most commonly used in removing heavy metals like chromium, cobalt, lead, nickel, mercury, etc as these metals are toxic in nature. If they get accumulated in organisms they are very hard to metabolize. Earlier bagasse ash, fly ash has been studied as an adsorbent and has been proved efficient. A study is conducted using Tobacco Ash as an adsorbent. Its efficiency is determined based on contact time, amount of substrate (adsorbent) needed, optimum pH. The comparative study of the results is done between Langmuir model and Freundlich model.

**IMPACT OF LIVELIHOOD OF FARMERS AND DEPLETION OF NATURAL RESOURCES**

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Periya Sooriyur, 20kms from Trichy district of Tamil Nadu, where inhabitants of this hamlet depend solely on farming. They find their ground water getting depleted owing to excessive water being sucked out by a ‘Soft Drink’ manufacturing company leaving the people high and dry and this would only get worse in the coming years. The plant has been in operation amidst lot of irregularities violating basic approvals required from Tamil Nadu Pollution Control Board, Town and Country Planning Department and Panchayat Union Council. The soft drink plants are generally chosen on the outskirts where the ground-water availability is plenty though they need to adhere to strict norms are being in place to regulate them. However, these norms are violated blatantly in connivance with the corrupt and inefficient government machinery causing untold misery to the hapless villagers who depend on the farming counting on the ground water. This paper addresses this core issue in detail.
WATER TREATMENT USING PHYTOREMEDIATION IN RURAL AREAS

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Safe drinking water is essential for leading a healthy life. Water borne diseases affect rural people and most of the seasonal diseases are due to impure water. Providing drinking water is a Himalayan task but providing “safe and hygienic water” is much more difficult, task. Urban people in our state get purified water which is merely chemical and does not carry germs, but unfortunately they are devoid of natural properties of water; the elixir of life. It’s not the lack of availability of water, but the lack of efficient water management system creates water scarcity.

It has been proved that the traditional techniques are capable of removing minerals and acidic components from water there by bringing about pH balance. Phytoremediation is an emerging technique, which was introduced in 1983, but hadn’t got any importance till now. So our aim is to find out different water purification techniques using locally available plants and its derivatives, which have medicinal values. Thus we are using different types of medicinal plants, seeds, tubers, and trees.

DESIGN OF RURAL SANITATION SYSTEM AND WASTEWATER TREATMENT PLANT

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Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and feces. Inadequate sanitation is a major cause of disease worldwide and improving sanitation is known to have a significant beneficial impact on health both in households and across communities. The word ‘sanitation’ also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal.

Rural water supply and sanitation facilities are vital elements in the overall programmes for rural development. Other related elements include infrastructural issues like land and watershed management, soil conservation, afforestation etc. and social issues like primary health care, eradication of illiteracy, women’s welfare, child nutrition, immunisation etc. It is desirable that the thrust and implementation of as many of these programmes as possible are converged in order to provide for integrated rural development.

Mobhippati Panchayat (South) is one of the Village Panchayats which falls under Harur Taluk in Dharapuram District of Tamil Nadu State. It lies at a latitude of 12°14'N and Longitude of 78°28'E. It is located at 35 km from Dharapuram and 5 km from Harur Town. It covers an area of nearly 113 acres. The Village has a tropical climate and receives low rainfall in winter than in summer. About 867 mm of precipitation falls annually and the temperature here averages 27.4 °C. The population as per 2011 census is 1280 people. The main occupation of the people in this locality is agriculture.

Currently, the village lacks proper sanitation facilities, which causes severe health problems. 7 people had lost their life due to dengue fever last year (Source: Govt. Hospital, Harur). To overcome this problem, an attempt has been made to provide proper sanitation facility for the village. This project deals with the design of sanitation system and wastewater treatment plant for a part of Mobhippati panchayat (Alagiri nagar, Ettipatti colony and Ettipatti). The treated wastewater will be discharged into the canal in that area which is connected to the nearby lake. This will increase the ground water level of the surrounding area and lead to economic development of the village. This will also improve the hygienic conditions of the area and prevent the spread of diseases.
BIOGAS PRODUCTION FROM WATER HYACINTH

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Energy has been exploited since the prehistoric times. With the advent of industrial revolution, use of fossil fuels began growing and increasing till date (Patil J.H. et al 2011). Biogas, a clean and renewable form of energy could very well substitute for conventional sources of energy such as fossil fuel, oil etc. which are causing ecological-environmental problems. Renewable energy plays an important role in reducing the green house gases, particularly energy from biomass could contribute significantly as it is a "carbon neutral" fuel (Jagadish H. Patil et al 2012). Biogas is a gas produced via breakdown of organic matter in the absence of oxygen. It is produced by the anaerobic digestion or fermentation of biodegradable materials like biomass, sewage, municipal waste, plant materials and crops (Ipeghan J. Otukaru & Evelyn V. Ogedengbe 2013). Eichhornia crassipes commonly known as water hyacinth, is a monocotyledonous fresh water aquatic plant belonging to the family Pontederiaceae, related to the lily family, Liliaceae, and is a native of Brazil and Equador region. It is an aggressive weed that extensively invades the beaches blocking access to clean water for domestic, livestock, and recreational uses (Ochieng E. & Kaseje M 2014). The potential impacts include reduction of biodiversity, blockage of rivers and drainage system, depletion of dissolved oxygen and involvement in environmental pollution. Water hyacinth has been used for a variety of applications such as production of paper, crafts, ropes and furniture (Chartchaleerim Isarankura-Na-Ayudhya 2007). Wolerton, Shiramulu & Bhargava, Klas & Ghosh have reported that water hyacinth could be utilized as a source of methane-rich fuel (Vaidyanathan S et al 1984). Water hyacinth is very efficient both in fully exploiting aquatic nutrients and in utilising solar energy for photosynthesis production. Attempts have been made to study the production of biogas from water hyacinth. Water hyacinth was collected from Kurichi lake. Studies were carried out using laboratory scale models for biogas production by liquid displacement method.

IDENTIFICATION OF THE UNWANTED POLLUTANTS FROM THE SEWAGE NETWORK
- AN ENVIRONMENTAL FORENSIC APPROACH

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The presence of unwanted contaminant in sewage network can cause severe problems in sewage treatment. The remediation of a contaminant site requires an optimal decision making system to identify the pollutant source characteristics accurately and efficiently. To recover the release history, source and initial concentration an inverse model is developed by integrating the transport model.

The flow system is assumed to be dimensional. The equation can be solved using MATLAB software. By using this solution history, source and initial concentration can be found.
ESTIMATION OF RUNOFF USING WATERSHED MODELING SYSTEM AND GIS

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Geographical Information System (GIS) is a computer system designed to capture, store, manipulate, analyse, manage, and present all types of spatial or geographical data. GIS helps to develop database of Land use/Land cover, Soil, Slope and drainage details of any geographical area. The prepared maps are can be analysed in watershed modelling software. Modelling is one among many assessment tools used in watershed planning and management. The watershed Modelling System is a comprehensive hydrologic modelling environment and provide tools for all phases of watershed modelling including automated watershed and sub basin delineation, geometric parameter, computation, hydrologic parameter computation (CN, time of concentration, rainfall depth etc.) and result visualisation. WMS is used with GIS in this paper to estimate the rainfall characteristics from Cheekuzhi watershed located in Palakkad district. The morphological parameter for the same was determined. The rainfall data for 13 years were used for the analysis and estimation of runoff for the study area.

CHECK DAM IN SUSTAINABLE WATER MANAGEMENT

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A check dam is a small dam, which can be built across a river or canal and allows the water to seep into the soil. Check Dam can be constructed inexpensive.

We can construct many check dams across our rivers. Thus, we can store huge amount of water in all rivers. Also at possible check dams, we can increase the depth of the river by fifteen feet in front of the embankment slope wall, it will help to increase the volume of storage water.

This paper discusses other beneficial effects of construction of porous check dam like reduction in canal scouring and erosion, promotion of sedimentation at the check dam site, reduction in sedimentation at dam hence improving effectiveness of storage volume of reservoir. Also, porous check dam trap pollutants and improve water quality.

Specifications of porous check dams are also explained.
PROCESS AND BENEFITS OF ZERO LIQUID DISCHARGE

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With an increasing usage of natural water resources, and unceasing pollution posed by industrial effluents into the environment, it has become necessary to implement zero discharge systems in industrial waste water treatment plants. The main goal of zero liquid discharge is to reduce water pollution and avoid effluents. The concept of zero discharge implies the following: 1) recovery of reusable water/other materials from waste water; 2) minimization of polluting substances into the environment. Like the conventional waste water treatment systems, zero discharge system also includes primary treatment, secondary treatment and tertiary treatment. However, the main objective in a zero discharge treatment system is to see that 1) the processes utilized for waste water treatment does not generate any additional pollutants; ii) production of waste is minimized by suitable selection of unit processes and adjusting operating parameters; iii) pollutants in the wastewater are transferred to solid phase (sludge); iv) sludge is stored in a secured landfill; v) recovery of reusable materials, especially water, salts, etc are achieved. A small number of pilot zero liquid units are being implemented in different places by the government to minimise the water pollution. Hence, it can be said that Zero Liquid Discharge (ZLD) represents the ultimate cutting-edge treatment system for the total elimination of wastewater effluent into neighboring waterways. In this paper we shall discuss the different methodologies adopted in the various Zero Liquid Discharge systems.

Keywords: ZLD, Water pollution, reusable water, effluent discharge

REMOVAL OF CHLORIDE FROM LAKE WATER USING ULTRA-HIGH LIME WITH ALUMINUM PROCESS (UHIA)

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Chlorides are the natural substances which are found in the water bodies in varying amounts. However, their concentrations are significantly low. However, the industrial, domestic and agricultural wastewaters that are generated from the human society may contain large amount of chlorides, which can cause significant disruption in the ecological balance. Many techniques have been adopted in order to reduce the amount of chlorides in wastewater like demineralization, reverse osmosis, coagulation, precipitation, electrodialysis and so on. However, these techniques are cost consuming capital cost wise as well as maintenance cost wise. The Ultra High Lime with Aluminium process is an innovative technology which is used for removal of chlorides as of precipitation Calcium chloroaluminate (Ca4 Al2 Cl2 (OH)12) by using sodium aluminate. Also, these conditions allow the precipitation of sulfate as Calcium Sulfoaluminate (Ca6 Al2 (SO4)3 (OH)12). Operating cost of the UHLA system is slightly higher due to the constant requirement to add aluminum. The sludge that is obtained contains almost 39% aluminum by weight.
IMPACT OF LINED/UNLINED CANAL ON GROUNDWATER RECHARGE BY USING VISUAL MODFLOW IN THE LOWER BHAVANI BASIN, TAMILNADU, INDIA

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Bhavani basin is the fourth largest Sub Basin in the Cauvery basin. The entire command area of all three major canals that takes off from the Bhavani river falls within the Erode District i.e. Lower Bhavani Project (LBP), Kodiveri and Kalingarayan canals. The LBP canal is a major source of irrigation in Erode District. Many of these canals are unlined and leakage takes place from them. Thus the seepage from the canal helps in recharging the wells in the area, enabling to get adequate water supply for the crops when water was not released from Bhavanisagar Dam. In this study, the Groundwater recharge is determined by groundwater flow modeling using Visual MODFLOW model. For this purpose, three major natural sources of groundwater recharge are taken into consideration such as rainfall infiltration, canal seepage and return flow of irrigation. The model was run and ZONEBUDGET gives an idea about the amount of recharge from lined/unlined canal to the field. Unlined canal helps to recharge the groundwater about 20% more than the lined canal. The analysis reveals that the annual rainfall also has rapidly changed in this region. In the LBP canal Head reach meets their requirement with available quantity of water from the canal system. Tail end reach does not receive the required quantity of water because of seepage loss and conveyance loss. Hence the lined canal can be provided for full length of the main canal. Branch canals and minor distributaries are suggested to maintain the canals with unlined canal system.

Keywords: Lower Bhavani basin, Erode, Groundwater flow modeling, Irrigation practice, Lined canal system

REMOVAL OF HEAVY METAL CHROMIUM BY USING BIOADSORBENT (ARACHAE SHELL) IN ADSORPTION TECHNIQUE

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Adsorption processes are being widely used by various researchers for the removal of heavy metals from wastewater. Despite its extensive use in water and wastewater treatment industries, in recent years, the need for safe and economical methods for the elimination of heavy metals from contaminated waters has necessitated research interest toward the production of low cost alternatives to commercially. The objective of this research is to study the utilization possibilities of less expensive adsorbents for the elimination of heavy metals from wastewater. Activated carbon produced from raw arachae shell powder was used as adsorbent to remove chromium metal from industrial wastewater. Adsorption experiment was conducted to examine the effects of adsorbent dosage, contact time, pH, rpm and concentrations. The obtained results showed that, the adsorption of the metal ions was adsorbent dosage, contact time, pH and concentration dependent. The optimum adsorbent dosage, stirring rate and pH were found to be at 1.5 g, 250 rpm and pH 6, time 230 mins respectively. The study also showed that activated carbon prepared from arachae shell can be efficiently used as low cost alternative for removal of metal ions.

Keywords: heavy metals, adsorption, wastewater.
NANOTECHNOLOGY FOR WATER PURIFICATION

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Nanotechnology encompasses a broad range of tools, techniques, and applications and is widely perceived as one of the most significant technologies of the 21st century. Engineered nanomaterials are manufactured materials with a structure between approximately 1 nanometer (nm) and 100 nm. Their unique physicochemical (e.g., size, shape) and surface (e.g., reactivity, conductivity) properties contribute to the development of materials with novel properties and technical solutions to problems that have been challenging to solve with conventional technologies.

Nanotechnology for water purification has been identified as a high priority area because water treatment devices that incorporate nanoscale materials are already available and human development needs for clean water are pressing. This paper describes:

- How lack of access to clean water and sanitation is affecting millions of people;
- The broad range of issues people confront when implementing projects for improving access to clean water;
- Specific water treatment devices that incorporate nanotechnology; and,
- Potential opportunities, risks, and other issues associated with these technologies.

The nanotechnology applications include:

- Nanofiltration membranes, including desalination technologies;
- Attapulgite clay, zeolite, and polymer filters;
- Nanocatalysts;
- Magnetic nanoparticles; and
- Nanosensors for the detection of contaminants.

THE GANGES RELIFE SYSTEM

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Water is just a one of the object on the earth, it is vital to the earth especially for living being. In India water system management sector is very important. The water is not only used for domestic, industrial and irrigation. In some places people believe that water body's is holy properties, "THE GANGES" is the best example for such a holy river, and it is stared from Himalayas then empties in to Bay of Bengal. It is 3rd largest river by discharge. It occupies the north-south side of India. It is life source of being. It flows across 2532km in India and Bangladesh. The 40% of hydroelectricity taken from Ganges distributaries and irrigation purpose also every day up to 200 cremations is thrown in the Ganges Due to holy acts. Ganges getting contamination day by day rapidly; in future it is very serious issue. The Ganges river basin is one of the most fertile and densely populated in the world, it is covers 10,80,000 km2. The river flows through 29 cities and 48 towns, so there are many reason to have a ministry for dealing this issue. So the cleaning process must be speed up. So in this paper deals the varies parameters which will speed up the cleaning process with more sustainable.
WATER CONSERVATION TECHNIQUES

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Water conservation encompasses the policies, strategies and activities to manage fresh water as a sustainable resource, to protect the water environment, and to meet current and future human demand. Population, household size and growth and affluence all affect how much water is used. Rainwater harvesting systems redirect and store water for both potable and non-potable uses including drinking, irrigation, laundry, hygiene and toilets. Most rainwater collection systems are designed to capture rainwater from roofs and store it in tanks. This paper outlines introduction, strategies, water demand in landscape, rain water harvesting, social solution, conclusion.
FLOOD INUNDATION MAPPING

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The flood inundation mapping is an essential component of flood risk management. The flood inundation maps provide accurate geospatial information about the extent of floods. When coupled with geographical information system, it can help decision makers extract other useful information to assess the risk related to floods such as human loss, financial damages, and environmental degradation. We have analyzed hydraulic modeling of cooum river in Chennai. The study area specifically from the mouth of the Cooum at the Bay of Bengal (Latitude 13.0677° N – Longitude 80.28748° E) to the Chetpet railway bridge (Latitude 13.0683° N – Longitude 80.2311° E) covering a length of about 9 km along the river. Rainfall data of Chennai and cross section detail are collected for study area to do hydro meteorological analysis. We have used HEC-RAS software for modelling. To give suggestion for modification required to existing canal to carry the flood safely.

WATER QUALITY ASSESSMENT NEAR UKKADAM LAKE
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The present investigation is carried out for determining the various physico-chemical characteristics of water from Ukkadam pond & near by open wells in Coimbatore district at two different seasons (summer and winter). Among the several methods of water quality determination, the widely used index of Weighted Arithmetic Index method has been followed in this present study. The following physico-chemical include Hardness, Calcium, Magnesium, pH, Nitrates, Fluorides, Total dissolved solids (TDS), Electro-conductivity (EC), Chloride, Sodium, Potassium and Sulphate were analysed. With the observed results, the water quality index value ranges from 100-200 (i.e., poor water) and the concentration of ions are beyond the acceptable limit. Therefore, it is concluded that the water is not potable for drinking.
GIS APPLICATIONS IN WATER RESOURCE MANAGEMENT-A CASE

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This paper mainly emphasizes on the various applications of GIS (Geographical Information System) in water resources. The main applications of GIS includes boundary delineation, finding flow accumulation, flow direction, stream ordering, different analysis such as slope analysis, aspect analysis etc. Different parameters affecting runoff can also be calculated using these findings. This paper deals with various analysis done for Aliyar sub basin using GIS. Various parameters affecting runoff is also discussed. Geographic information system can be regarded as a special form of information system that provides the required information by processing and analyzing geographical data. Data are said as geographically referenced when they are registered to an accepted geographical coordinate system.
GENESIS OF WATER INSTITUTE

The Water Institute—a Centre of Excellence of Karunya University came into existence in August 2008. The founders of the University had a vision to make use of science and technology to address basic social issues, especially those pertaining to livelihood. The institute is perhaps the first of its kind to be started in a university in India to address the multifarious functions associated with the water sector, namely academic programmes, R&D, extension, consultancy and collaborative research. The institute offers a unique postgraduate course in Integrated Water Resources Management (IWRM) for graduates in engineering and postgraduates in physical sciences. Most of the past students of IWRM have been well placed.