

EARTHY-WORTHY

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*DEPARTMENT OF ENVIRONMENTAL
SCIENCE & TECHNOLOGY*

WE SHARE BECAUSE WE CARE

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MESSAGE FROM HOD'S DESK

Dr. Snehal Lokhandwala



“Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has”

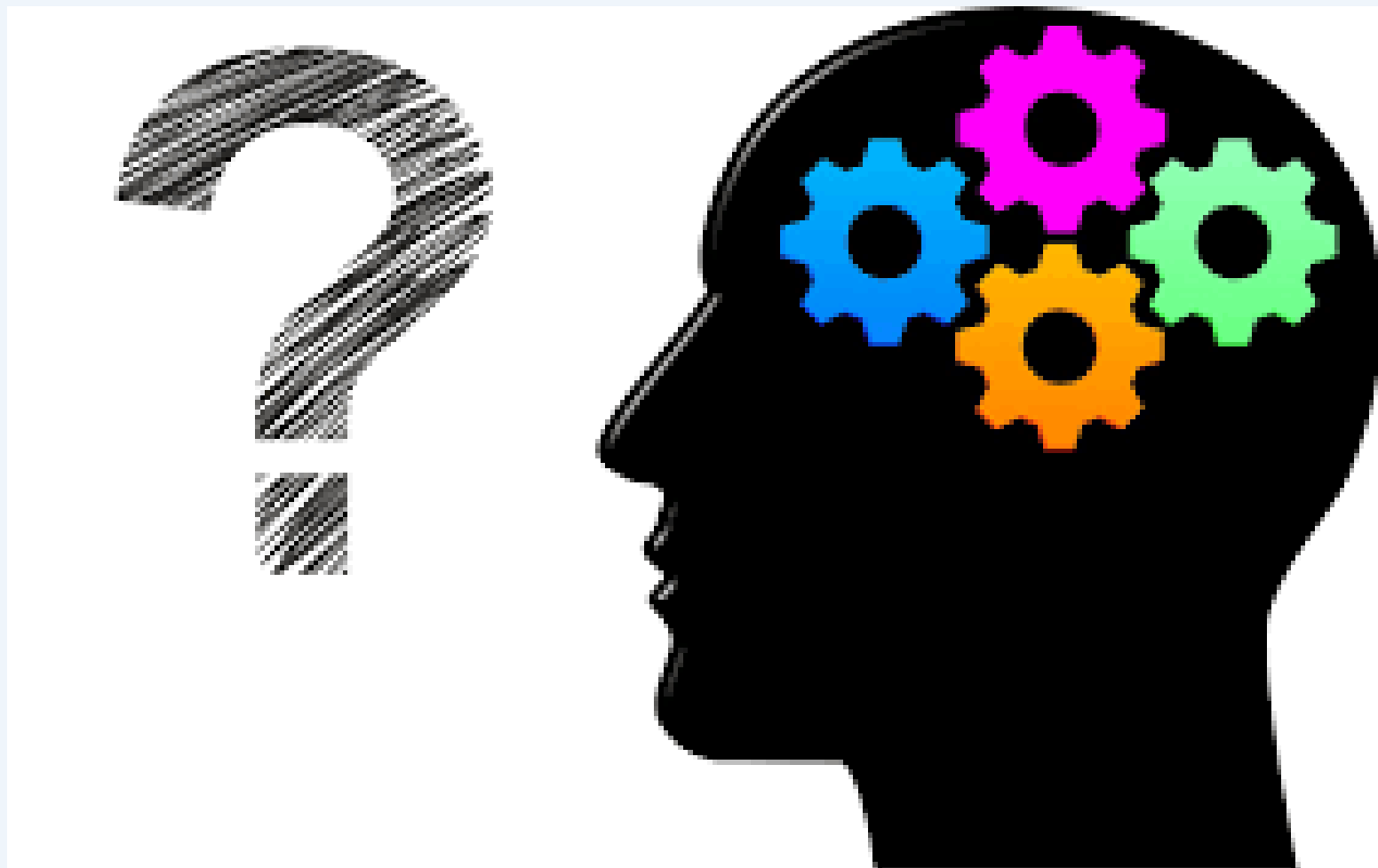
Margaret Mead has rightly quoted the above lines and we are that small committed group of environmentalists who believes that our globe is under new dramatic environmental pressure: our globe is warming, our ice caps melting, our glaciers receding, our coral is dying, our soils are eroding, our water tables falling, our fisheries are being depleted and our remaining rainforests shrinking .

In recognition of the interdisciplinary nature of these challenges, the mission of Environmental Science & Technology Department is to equip the students with deep knowledge and enabling them to contribute to world-leading research and specialized professional practice that helps protect human health, welfare and the environment. The approach of the department is to make the learning process for the students interesting and participative with experiential learning and strong emphasis on practical education, and exposure to real time scenarios through strong industry interface.



DEPARTMENTAL

ACTIVITY





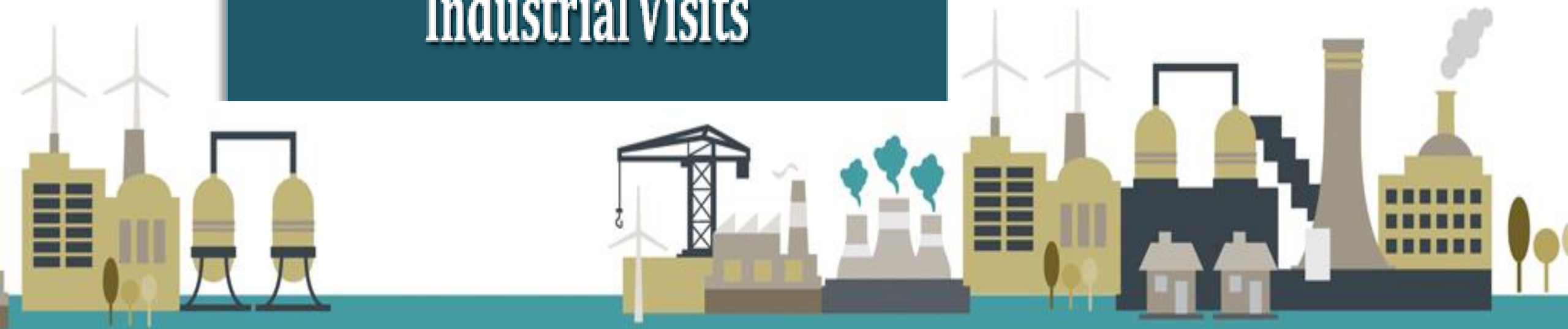
EXPERT LECTURES

Sr. No.	Semester	Name of Expert	Designation of Expert (With name of industry)	Correlated subject	Date
1.	3 rd	Dr. N V Sojitra	Colochem India Pvt.Ltd	General	5/10/2018



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Industrial Visits



Sr. No.	Semester	Name of Industry	Correlated subject	Date
1	3rd	Pandesara Infrastructure Limited	CETP	01/10/2018



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WOMEN SELF DEFENSE TRAINING PROGRAMME

Sanskrutik Seva Samaj Samiti and Shroff Rotary Institute of Chemical Technology SRICT conducted Women's Self defense training organized by Department of Environmental Science and Technology on 10th October 2018 for girls students of 3rd,5th and 7th semester of SRICT in order to provide them appropriate self defense which would enable to secure themselves in each and every situation of life.

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ACTIVITIES

TREE PLANTATION ACTIVITY



Department of Environmental Science and Technology had organized Tree Plantation Activity on 27/12/2018.

The entire event was coordinated by Ms. Bhasha Mehta along with all the faculties of the department and students under the guidance of Ms. Pratibha Gautam (Coordinator Nature Club) and Dr. Snehal Lokhandwala (HOD).

Students of EST department planted approximately 100 plants at different locations in our college. Adequate measures for plant survival were undertaken and students played a significant role in that. For maintaining cleanliness of surroundings, black liner bags were used to collect waste. The event ended with refreshment for students and faculties.







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PEEKING INTO DUSTBINS A SERIOUS BUSINESS

Food firm cuts waste at Mum airport lounges, saves ₹1.2cr

Manju.V@timesgroup.com

Mumbai: Garbage though it may be, crores can be saved simply by studying the contents of dustbins at airport lounges, cafes and food outlets, it seems.

Last year, a delayed flight had the chief operating officer (COO) of the food and beverages firm that runs GVK lounge at Mumbai airport don a pair of gloves and rummage through a bin on the premises to find out why it had spilled over.

The bin revealed the peculiar dietary habits of frequent flyers who hit the free lounge buffet before hopping on to their late-night international flights. In the months that followed, the firm brought about changes in the way food was presented at various lounges to reduce wastage. A year later, the firm realised that the decision to dive into the bin was an "open sesame" moment as it had saved Rs 1.2 crore through changes made to the desserts section alone.

This April, the firm turned "Dustbin Analysis" into a quarterly feature to be undertaken at its 280 food outlets across 19 cities, including lounges in airports at Mumbai, Delhi, Chennai and Kolkata. The annual target: Savings of Rs 4-5 crore through dustbin speak alone.

"The bin at the GVK lounge was full of barely eaten desserts," said Gaurav Dewan, COO and business head, Travel Food Services (TFS). The dinner buffet had 15 desserts on offer that

IMPACT OF QUARTERLY 'DUSTBIN ANALYSIS'

Pastries | 40% reduction in portion sizes, more options. ₹1.6cr savings at 5 lounges of Mumbai airport

Condiments | Considerable reduction in wastage of sugar sachets, ketchup, sugar-free and condiments

Cooked food | Kitchens
➤ After finding that cooked food was thrown in bins, staff began to record cases of spoilage, which brought it down significantly



➤ Noticed unused spoons, glasses, removed packaging from display items, worked on menus so that product doesn't get stale and brought down cost by over ₹16L at T1 alone

night. "Each passenger would pick two or three, maybe even four. They would eat a spoon or half and throw the rest," he said.

He ordered a three-day survey. Lounge passengers were asked about the food and found the problem was not with taste but quantity.

The kitchen team reworked the menu to introduce small-sized desserts such as tiny cup cakes, macaroons, donuts and meringues. "Earlier, we offered 15 desserts in the lounge. Now, we offer 18 but small portions. Our dustbin waste has reduced, spoilage has reduced, cost has reduced. We saved Rs 1.2 crore in a year's time from the five lounges at Mumbai airport in the desserts category alone," said Dewan. "Now, it's become a religion. We target to save Rs 4-5 crore through this alone."

Dustbins of outlets

where people pay for food speak a different language though. "Through bins used by customers we learn what food item is not doing well while kitchen bins reveal what has been overproduced," he said. Then again, dustbins revealed that 80% of sandwiches they sold were served grilled. "The staff would bin the packaging, grill the sandwich and serve it on a plate. So we eradicated the packaging," he said. At all 70 coffee shops TFS runs, sandwiches, rolls and quiches are displayed sans plastic wrapping in a temperature-controlled cabinet.

"Sandwiches come wrapped in butterpaper. These wraps are bio-degradable. Each of the earlier sandwich packaging cost around Rs 7. We sell close to a million sandwiches a year. That's Rs 70 lakh saving only on packaging. Butterpaper cost us 25 paise," he said.

snowfall in I&K h...

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From nose filters to charcoal bags, bad air means good business

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An air quality index between 0-50 is considered good. A day after Diwali the AQI in Delhi stood at 642, which means very polluted air. But Lavanshi Jain, an asthma patient residing in Rohini in north Delhi, was not too worried. Every day she steps out of her house wearing a pair of thin mesh-like nostril filters. "It has helped me breathe better, and my asthma attacks have reduced," believes Jain.

Jain is using a product called Nasofilters, developed by Nanoclean Global, a startup based in Delhi, in collaboration with researchers from IIT-Del-

Clean Air Catalogue

- Oxygen optimisers | ₹ 22,000-40,000
- Canned oxygen | ₹ 600-3,000
- Filters for nostrils | ₹ 10 a pair
- Activated charcoal air purifying bags for indoor use | ₹ 450-1,000
- Skincare products | ₹ 500-3,500
- Radio frequency wave device for indoors | ₹ 1.5 lakh



hi. These filters are made with a special cellulose-based fibre and claim to trap microscopic pollutants like PM 2.5 and 10. "It's use-and-throw. Each pair costs Rs 10 and can be worn for 10-12 hours daily," says Jatin

Kewlani, COO, Nanoclean Global.

Rising air pollution levels have spawned a mini industry of anti-pollution products that go beyond air purifiers and face masks. From small bags of

activated charcoal that clean up indoor air to bigger outdoor devices, the catalogue of anti-pollution merchandise is growing.

Bengaluru-based startup Devic Earth has developed a device, Pure Skies, which uses radio waves to scatter pollutants like PM 2.5 and 10, nitrogen oxide and sulphur dioxide. "Just like a billiards player clears up the table by hitting the cue ball that further hits other balls, this device emits waves that scatter these pollutants and clean up the air over a given area," explains Dr Srikanth Sola, CEO and founder, Devic Earth.

► Continued on P 7



Winged visitors give barren Nalsarovar a miss

Gujarat's Only Ramsar Site Dries Up Completely

Himanshu.Kaushik@timesgroup.com

Ahmedabad: Every December, Nalsarovar lake reverberates with the chirping of lakhs of birds and the awestruck hum of people marveling at nature's spectacle. This year, the picturesque site spreads out like a field of devastation: dry land has sucked life into its cracks. Overturned boats

complete the scene of blight. There are no birds and there is no water this December at Nalsarovar. Visitors wade through disappointment. For boatmen, circumstances are worse: a year's livelihood has flown away.

Nalsarovar lake is Gujarat's only Ramsar site. UNESCO's Ramsar convention, named after the Iranian city where the convention was inked in 1971, seeks to protect wetlands of international importance.

Forest officials concede that Nalsarovar, spread over 120 sq km, has completely dried up. The last time it sported such a desolate look was 16 years ago,



The last time the lake sported such a desolate look was in 2002

in 2002. "There is just a 300sq metre patch of inch deep water at Nalsarovar now," said S J Pandit, deputy conservator of forests of Nalsarovar. "That too is expected to disappear in the next 10 days. Poor rain this


monsoon is the main reason behind the lake drying up."

Officials said that migratory birds have made temporary home 22km away in Badla village in Surendranagar while many have flown to Jamnagar and

Porbandar on the Saurashtra coast. The officer said the non-release of Narmada waters for winter crops for the past two years has been a major contributor to the lake's dry state.

Forest officials say winter at Nalsarovar draws, on an average, 1.25 lakh birds including the famed Greater Flamingos. During 2016 census, 3.13 lakh birds were recorded in Nalsarovar and nearby areas. Currently, officials say, just over 50 birds can be spotted. Needless to say, tourists are turning away disappointed.

► Continued on P 4

THE BEST
teachers teach
from **THE** 
not from the
BOOK.



A teacher takes
a *Hand*, opens
a *Mind* and
touches a *Heart*



**A good
teacher is like
a candle - it
consumes
itself to light
the way for
others**

The heart of a university and any department is the

FACULTY

This should be the most important consideration for a student choosing a college. Our department is endorsed with highly qualified faculty having scientific vigor and committed to excellence.



- **Name:** Mr Rahul Sharma
- Assistant Professor
- **Qualifications:** B.E Chemical Engg
- M.Tech Chemical Engg
- **Experience:**
 - Teaching :1.8Yr
 - Industry : 5 yr
- **Areas of Interest:** Reaction Engineering, Process Control, Instrumentation Process, Control Designing

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HAPPY
BIRTHDAY



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**FACULTY
BIRTHDATES**

*Ms. Janki Tailor
Mr. Manoj Kumar
Mr. Urvij Dave
Dr. Snehal Lokhandwala*

STUDENT BIRTHDATES

MODI FENALBEN DIPAKKUMAR
BHANUSHALI MEET DIPAKBHAI
DALAL HARSHRAJ FALGUN
KHATRI FALGUNI NANDKISHOR
KUMAWAT MANAN DILIP
SABHADIYA TEJASVI KANTIBHAI
TAKOLIYA DEVRAJSINH
HARENDRASINH
UPPALURI DIDYMUS DEVANANDA

BHATT JINAL NILESHBHAI
CHAUHAN VIRAJ SINH CHETANKUMAR
DASHANDI KASHYAP NIKHILBHAI
HIMANSHU TRIPATHI
ICHHAPURIA KRISHNA JAYESHKUMAR
KARDANI HITARTHI VIJAYKUMAR
MEHTA MANSI UMESH
PALLIPAD ADRIJA JAYAPRASAD P
PANDYA ZALAK SATYEN
PAREKH PRANAVKUMAR KAMLESHBHAI
PATEL JAYKUMAR PRAKASHBHAI
PATHAK KRUNAL SURESH
PRAJAPATI UNNATI RAJUBHAI
RANA VANSHIKABEN SHAILESHBHAI
SINGH AMAN KUMAR SANJAY
TRIVEDI SHIVANI ANILKUMAR

DOLIA PRAKRUTI MANISHKUMAR
GOHIL ABHIRAJ SINH
JOSHI NIDHI SUNILKUMAR
MAHIMA MAHESHWARI
PANCHANI CHARMIBEN
PATEL NIRALIKUMARI
PATEL PRIYANSI
RAMOLIYA KEVAL DAYABHAI
SANGHANI JENISH
TRIPATHI SARVESH ANIL

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Faculty wise research papers done & projected

Sr. No.	Name of Faculty	No. of Research papers published before joining SRICT	No. of Research Papers published after joining SRICT	No. of Research papers projected in 2019	No. of Research papers published in 2018	Book chapter published after joining SRICT
1	Dr.Snehal Lokhandwala	2	16	08	04	01
2	Mr. Urvij Dave	6	6	02	04	
3	Mrs. Pratibha Gautam	2	8	03	03	3
4	Mr. Manoj Kumar	0	8	04	02	
5	Mrs. Janki Tailor	0	1	02	01	nil
6	Mr. Kunal Majmudar	1	11	03	02	
7	Ms Anjali Nair	1	03	03	03	
8	Mr. Rahul Sharma	01	00	02	00	
8	Miss Bhasha Mehta	03	00	02	01	
	TOTAL	14	53	29	20	

Process Optimization Of Dairy Wastewater Cycle

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ABSTRACT

Dairy industry is one of the water consuming industry in India due to which there is more exploitation of natural resources. We have chosen Dairy Industry situated near our town for study purpose. The inlet raw milk is 1,82,000 l/day to process. For the processing of 1,82,000 l/day milk, water consumption is 3,00,000 l/day to 3,50,000 l/day. The ratio of water consumption rate is 1.64. The influent contains COD, BOD & pH etc.. The influent COD ranges from 3200 mg/l - 3500 mg/l, which lead to waste generation in terms of SF and SNF. SF in the effluent is 367.33 kg SF and SNF in the effluent is 975.22 kg SNF. The ETP comprises of screen chamber, oil & grease tank & UASBR etc., which reduce COD load from 3800 mg/l to 25 mg/l. Stage wise efficiency has been identified and further UASBR efficiency is optimize. Process material balance & mass balance has been done for onsite treatment & waste reduction.

Keywords: - Optimization, COD, BOD, pH, SF, SNF

1. INTRODUCTION

India is one of the largest milk producers in the world. Indian milk industry more depends upon cooperative sectors where annual milk production is 155.5 million tones in year 2015-2016. In India 75,000 gallons per day dairy processing plant can use up to 110 million gallons of water a year. But if we are looking at world production then per cattle milk production is lowest in India. Indian milk's lifespan is very less in all over the world. Lots of milk is wasted due to lack of quality enhancement. The consumption of water per litre of milk production is also quite high in comparison to the other progressive countries. In New Zealand milk remains good in quality for six months of time due to addition of preservatives while in India it will be not more than 2 to 3 days. This is an attempt to highlight different techniques of milk processing with the perspective of Indian dairy industry and other dairies from all over the world. It also provides data of modifications required in Indian dairies. How to reduce wastewater cycle in milk processing and distribution. The scope of reuse and recycling of wastewater. Waste to energy possibility is also outlined with examples.

1.1 BACKGROUND

Wastewater treatment technology is designed for elimination of contaminants to satisfy discharge standards. There are many methods for treating the dairy wastewater. Physico-chemical and biological treatment methods are usually used to treat the dairy effluent.

However, several studies had found that the process of removal of COD is very poor in Physico-chemical treatment the cost of the chemical reagents used is very high. Rather than Physico-chemical process, biological treatment has good organics removal and effluent quality. As a biological treatment, there is generally the activated sludge process and other anaerobic process is used.

“Comparative Study of Dairy Wastewater Treatment & Its Optimization”- A Review

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Abstract— Environmental degradation and Pollution control are the most growing concerns of today. Milk plays a very important role in our daily life. As the demand for the milk and its product increases, the number of milk manufacturing units comes up in the market. In India, there is the number of industries relating the milk and its product. As the more dairies established, the quantum of pollution get increases. The dairy industry is most polluting food industries in regard to its high water consumption rate. The quantity of the fresh water required in the dairy plant is expressed in terms of the maximum weight of the product handled and the processes involved in the production. When the wastewater of the dairy plant containing high COD, BOD, pH, high amount of the nutrients, microbes, suspended solids, etc. discharged into the water bodies, it disturbs the ecological balance of water bodies causes taste and odor, also impart the color and turbidity and promote the eutrophication.

Key words: Dairy effluent, COD, BOD, pH, Odour, Optimization

I. INTRODUCTION

Generally food industries are having highest consumption rate of water and they are the biggest producer of the effluent (Containing high BOD) per unit of the production. Additionally, they generate the large volume of the sludge during the secondary treatment of the wastewater. The milk is one of the most important products required in everyday life as a food product. Therefore, to maintain the desired standards of its quality and quantity, various operations have been performed in the production of the consumer milk. Operations such as transportation, handling of the milk, processing, packaging, etc.

The growth of the dairy industry has not only increased the production of the milk and its co-product but also increased the consumption of the fresh water into the production unit. Due to this, wastewater generation is increased and its discharge resulted in the release of the toxic substances into the environment. Dairy wastewater significantly affects the natural processes of the ecosystem.

The dairy industry is one of those units which consume water in high rate in the heat exchanger, boiler, chilling process, cleaning silos, homogenizer, etc. which generate a large amount of the effluents with the high organic load. This organic load is generally constituted of the effluent with high COD, BOD, pH, oils & grease, nitrogen and phosphorous, fats, suspended and soluble solids which cause several effects on the environment such as eutrophication, color, taste, odor, turbidity. After the discharge of the dairy wastewater, receiving waters can be affected by it with an increased rate of DO depletion, a decrease in the pH level due to the conversion of lactose to Acetic acid in the fermentation process. An increase of casein bed deposit at acidic pH

values, an increase in fungal growth due to a pH drop, destruction of marine life due to the entry of detergents and cleansers from the cleaning process. To prevent this, new technologies and new methods to treat the dairy wastewater with good efficiency, are needed.

II. RECENT SCENARIO OF DAIRY INDUSTRY IN INDIA

As the growth of the industries increases, the production and release of the noxious substances and the consumption of water also get increased. This affects the normal operations, flora, and fauna and creates the health hazard. Milk production in India increased from 17 million tons in 1950-51 to over 109 million tons by 2008-09. As the production of the milk and its products increases, water consumption in dairy sector is also increased. The dairy industry is most polluting industry regarding the volume of the effluent generated. It generates about 0.2-10 liters of effluent per liter of the processed milk^[1].

Dairy effluent is mainly characterized by high BOD, COD and also contain fats, nutrients, lactose, detergents, etc^[1]. Due to the high pollution load of dairy effluent, the dairy industry discharging the partially treated wastewater cause environmental problems such as the increase in microbial biomass, depletion of DO, mushroom, eutrophication of the receiving surface water.

In India, the issue of the water scarcity is getting serious day by day. The dairy scenario in the current year is different compared to past many years. To maintain the quality and the quantity of the consumer milk various new techniques are utilized which consumed the huge quantity of the fresh water in their process, cleaning purpose. In present, it is necessary to reduce the huge water consumption by improving the plant treatment efficiency, reducing its pollution parameter and by recycling/ reusing the treated water in the plant.

A. Objective of the Present Work

- 1) *Examining the Process of the Industry*
 - To identify the sources of the wastewater in dairy
 - To identify the wastewater minimization by process alteration.
- 2) *Characterization of the Wastewater*
 - To estimate the concentration of the pollution parameter in wastewater.
 - To decide the type of treatment required by the wastewater
 - To compare the parameters with the standards.

B. Sources of the Wastewater in Dairy

Operation	Processes	Sources Of Waste
Preparation stages	Milk receiving/storage	□ Poor drainage of tankers

Removal of High TDS from Effluent

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Abstract— Human society always tries to elaborate itself towards the progress. During this journey, human needs to mitigate the Industrialization problems as well as the Environmental issues. The handling and management of wastewater generated in industries is the major problem. The wastewater contains different types of pollutants and it is important to remove the same from the wastewater before disposing it. We are focusing on the removal of Total Dissolve Solids from wastewater through Electrocoagulation Process. Electrocoagulation is a surface reaction. It is the process of passing electric current through a waste water, using anode and cathode. In this experiment iron and aluminium electrodes are used and the sample is made up to run at different intervals of time i.e., 5, 10, 15 and 20 minutes and different range of amperes of current is passed in the sample i.e., 0.12 A, 0.25A, 0.36A. The combination effects of current, pH and treatment time to the efficiency of the electrocoagulation process for the removal of Total Dissolved Solids, pH, Color, chlorides etc. from the industrial effluent showed that only current (C) and treatment time (t) have correlation with each other. It concluded that the batch which is operated at 0.25A for 20 minutes has maximum removal efficiency of Total Dissolved Solids, pH, Color, chlorides, COD etc.

Key words: Domestic Waste Water, Electro Coagulation, Iron Electrodes, Time Intervals, Total Dissolve Solids

I. INTRODUCTION

Electrocoagulation is becoming a rapidly growing area of wastewater treatment due to its ability to remove contaminants that are generally more difficult to remove by filtration or chemical treatment systems. There are many brands of electrocoagulation devices available and they can range in complexity from a simple anode and cathode to much more complex devices with control over electrode potentials, anode consumption, etc.

In the simplest form, an electrocoagulation reactor is made up of an electrolytic cell with one anode and one cathode. When connected to an external power source, the anode material will electrochemically corrode because of oxidation, while the cathode will be subjected to passivation.

An EC system consists of pairs of conductive metal plates in parallel, in which they act as monopolar electrodes. It furtherly requires a direct current power source and a resistance box to regulate the current density and a multimeter to read the current values.

During electrolysis process, the positive side undergoes anodic reactions, while negative side undergoes cathodic reactions. Consumable metal plates, such as iron or aluminum, are usually used to continuously produce ions in the water. The released ions neutralize the charges of the particles and thereby initiate coagulation. The released ions remove undesirable contaminants by chemical reaction and

precipitation. But electrocoagulation technology cannot remove infinitely soluble matter. Therefore ions with molecular weights smaller than Ca^{+2} or Mg^{+2} cannot be dissociated from the aqueous medium.

The electrocoagulation-flotation method for wastewater treatment has a greater ability for the removal of Total Dissolve Solids (TDS), chemical oxygen demand (COD) and suspended solids (SS) from effluents in comparison with treatment by conventional coagulation and so the present laboratory scale studies have been carried out to treat industrial effluent using electrocoagulation.

II. LITERATURE SURVEY

Mamdouh Y. Saleh, Gaber El Enany, Medhat H. Elzahar and Mohamed Z. Elshikhipy has studied about the Use of Alum for Removal of Total dissolved Solids and Total Iron in High Rate Activated Sludge System. The principal target of this research work is to develop the highly loaded activated sludge stage of the multiple-stage plant which is characterized by the high treatment efficiency, optimal and low prices and small areas compared to the conventional activated sludge treatment plants. The results clearly indicate that the highly-loaded activated sludge has a high elimination efficiency of inorganic matters in comparison with the mechanical stage of the conventional treatment plants. Without adding alum salt, the removal efficiency of the TDS was approximately 28.91% and the total Iron (Fe) was 45.07%. Adding alum salt improved the elimination efficiency of TDS and the total Fe in the first treatment stage. The iron elimination efficiency was increased by using more dosage of Alum Salts until the efficiency reaches to 200mg/L.

Geena G. Pradeep, Krishna Priya Sukumaran, Georgette George, Febin Muhammad, Nisha Mathew has aimed at the study of Removal of Dissolved Solids in Waste Water using Activated Carbon from Coconut Shell. Activated carbon prepared from coconut shell has high efficiency in the reduction of TDS in waste water. The high surface area of activated carbon is directly responsible for the effective reduction in TDS. In the generation of activated carbon with high surface area, Method of activation plays an important role. An effective reduction in TDS can be achieved by treating waste water with activated carbon prepared from coconut shell for a time period between 20 to 30 minutes. From the result it is also determined that a complete removal of TDS can be achieved by stirring with activated carbon for about 70 minutes. Treatment with activated carbon at higher temperature would be promising but a room temperature process is always preferred over high temperature process because of energy considerations.

O I Nkwonta, G M Ochieng has studied about the Total dissolved solid removal in wastewater using roughing filter and It was indicated that roughing filter can perform



THE WORLD



WITHOUT US

CREDITS

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DR. SNEHAL LOKHANDWALA

MS. PRATIBHA GAUTAM

MS. BHASHA MEHTA

STUDENT

MR. TASVIR PATEL



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