THINK INDIA JOURNAL

ISSN:0971-1260

Vol-22-Issue-10-November-2019

Effluent To Elixir -Innovative Waste Management With Special Reference To Kasargod Latex Factory

*Subbulakshmi S.[1], Research Scholar, Annamalai University, Tamilnadu.
Mobile: + 91 9845082172, E mail: subasushan@gmail.com
Dr. J. Jayavel[2], Assistant Professor, Annamalai University, Tamilnadu.

ABSTRACT

Water is essential for all living beings and hence called the elixir of life.Being one of the scarce resources it is the duty of us all to use the resource conservatively and find out the innovative ways of recycling and reusing the resources to ensure that our next generation is also getting the taste of elixir. Though water is scarce, we can't deny the fact that many processing industries need a large quantity of water to carry on their day to day activities and Rubber industries is one of its kind. Kasargod Latex Factory is one such factory located in Kasargod district of Kerala which utilizes a large quantity of water for their rubber processing units but successfully implemented the innovative recycling methods to convert the wastewater into a usable resource.

The study is to analyze the waste management technique followed in the factory where the effluent water from the factory is converted into potable water for agriculture and also intended to find out the corporate social responsibility of the rubber factories which will benefit the society as a whole. Secondary data from the factory is used to analyze the data of the quantity of water used for processing and quantity recycled.

Keywords: Corporate Social Responsibility, Effluent, Innovative method, Potable water, Recycling, Rubber industry

ISSN:0971-1260
Vol-22-Issue-10-November-2019

INTRODUCTION

The Hosdurg Co-operative Farmers Society was registered on 21st March 1967 and it was renamed as Hosdurg Co-operative Rubber Marketing Society in 1970. On the formation of Kasaragod Revenue District, the name was changed to the Kasaragod District Rubber Marketing Society (KDCRMS) and later as Kasargod latex Factory and it is one of the successfully operating rubber co-operative society in Kerala. KLF has entered the various sectors for production, processing, and marketing to serve the farmers and rural entrepreneurs.

The study is to analyze the waste management technique followed in the factory where the effluent water from the factory is converted into potable water for agriculture. Waste management is the processing or disposing of waste. It is the collection of all thrown away materials to recycle them, as a result, decreases their effects on our health, surroundings and the environment and enhances the quality of life. In the process of rubber milk processing and purification, water is segregated as the waste which is again purified by the factory by various stages of purification. The purified water is used for various purposes inside the factory and the remaining water is sent out for the agricultural purpose. The study is intended to find out the corporate social responsibility of the rubber factories which will benefit society as a whole.

According to Dyann Rose[1], an Australian case study is presented of an ongoing conflict between Alcoa World Alumina, a multi-national mining company and the impacted stakeholders of Yarloop, a small rural community in Western Australia. The model is premised on an ethic of love approach which utilizes the ideas of social justice, social sustainability, and the social pre-cautionary principle. Dibyendu Das[2], Ankuran Saha, Homagni Bhattacharjee argued that the whole operation of rubber processing including the waste disposal system is studied and subsequently the wastewater sample from the discharge point is collected and analyzed to find the effects of it on the environment.

K Syahputri[3], R M Sari, I Rizkya and I Siregar argued that the process activity mapping in the rubber industry used to identify the activities that take place on the floor of production to reduce waste and propose improvements that can be done to improve efficiency.

ISSN:0971-1260

Vol-22-Issue-10-November-2019

STATEMENT OF THE PROBLEM

The key determination is to study the effectiveness of waste segregation policy followed in the Kasargod latex factory. The water which is segregated in the process of purification of latex is purified by the innovative ways followed in the company by sending it into various stages of purification and it is used again inside the factory for various purposes. The problem undertaken is to analyze the efficiency of the process of water treatment so it is transformed from waste to usable water.

SCOPE OF THE STUDY

The study is conducted within the operational scope of the premises of the factory by understanding the various processes followed and chemical used. The study is conducted within the geographical scope of the Kasargod Latex factory in Kasargod district in Kerala.

OBJECTIVES

- To study the innovative waste management with a social cause in rubber industries with special reference to Kasaragod latex factory, Kerala
- To study how waste water management is beneficial to society
- To analyze the corporate social responsibility of rubber industries

IMPORTANCE OF THE STUDY

Kerala is the largest producer of natural rubber in the country and accounts for about 90% for the total production. About 10.15% of total natural rubber produced in the country is processed in the centrifuged latex in Kasaragod District. The centrifugal method needs lots of water for rubber purification and hence this study is important to know how wastewater disposed of these factories can be used back by society for various purposes.

TOOLS FOR DATA ANALYSIS

The researcher used the exploratory study to approach the above-stated problem. Secondary data is collected from the company's database to do the data analysis.

LIMITATIONS OF THE STUDY

ISSN:0971-1260

Vol-22-Issue-10-November-2019

- Dependence on secondary data
- Confidential data could not be obtained
- The personal bias of the researcher
- The study is limited to only Kasargod latex Factory

DATA ANALYSIS AND INTERPRETATION

Steps involved in the latex processing

1. **Sieving reception and bulking**

At the factory, the preserved field latex is first poured into the small reception tank after sieving. From the reception tank, the latex again flows into the bulking tank, and the field latex collected from different places are mixed here for getting uniformity. After this process, it goes into the desludging tanks.

2. Addition of DAHP

Di-ammonium hydrogen phosphate solution is added to latex to precipitate magnesium as magnesium ammonium phosphate.

3. Desludging

Magnesium ammonium phosphate being heavier than latex settles down to the bottom of the tank along with sand dirt and other heavier particles. This process is known as desludging.

4. Concentration

Centrifuging is the technique used in Kasargod district co-operative rubber marketing society. Centrifuging is the process of concentrating latex under the influence of centrifugal force in the centrifuging machine. About 90% of the concentrated latex is produced by the method of centrifuging.

Concentrated latex is collected in the bulking tanks. Then ammonia water is added to the concentration to make it 60% dry content. In this process, a lot of water is discharged as effluent which should be treated.

ISSN:0971-1260

Vol-22-Issue-10-November-2019

EFFLUENT

Effluent in a simple manner is called as the waste, which means the waste sent out from the large factories or the places where sewage is dealt with. These are usually sent to the rivers, lakes, or the sea. Effluents in the large factories are mainly finding their way into the sea and those in the small or local factories are sending to the rivers. Different factories follow different methods to send these wastes. Effluent is a solid waste which is highly harmful to the environment.

In Kasaragod Latex Factory, they are innovatively treating the waste. Here the main effluent is the water that is separated from the rubber milk. They purify this wastewater and use it for the development of agricultural activities. The water will be highly acidic since it is added with acids. This wastewater is collected in the collection tank and pH (Potent of Hydrogen) is checked to find out whether it is acidic or alkali. This water comes to the primary settling tank and overflow taken place and then comes to the aeration tank. At this aeration tank, the water is treated with Bacteria which eats the sludge and purifies the water. Then the water is pumped into a chlorine dosing tank where it is treated with chlorine for complete purification. The water is sent to the purification tank for final filtration and purification before it is discharged for the domestic use inside the factory and agricultural purposes.

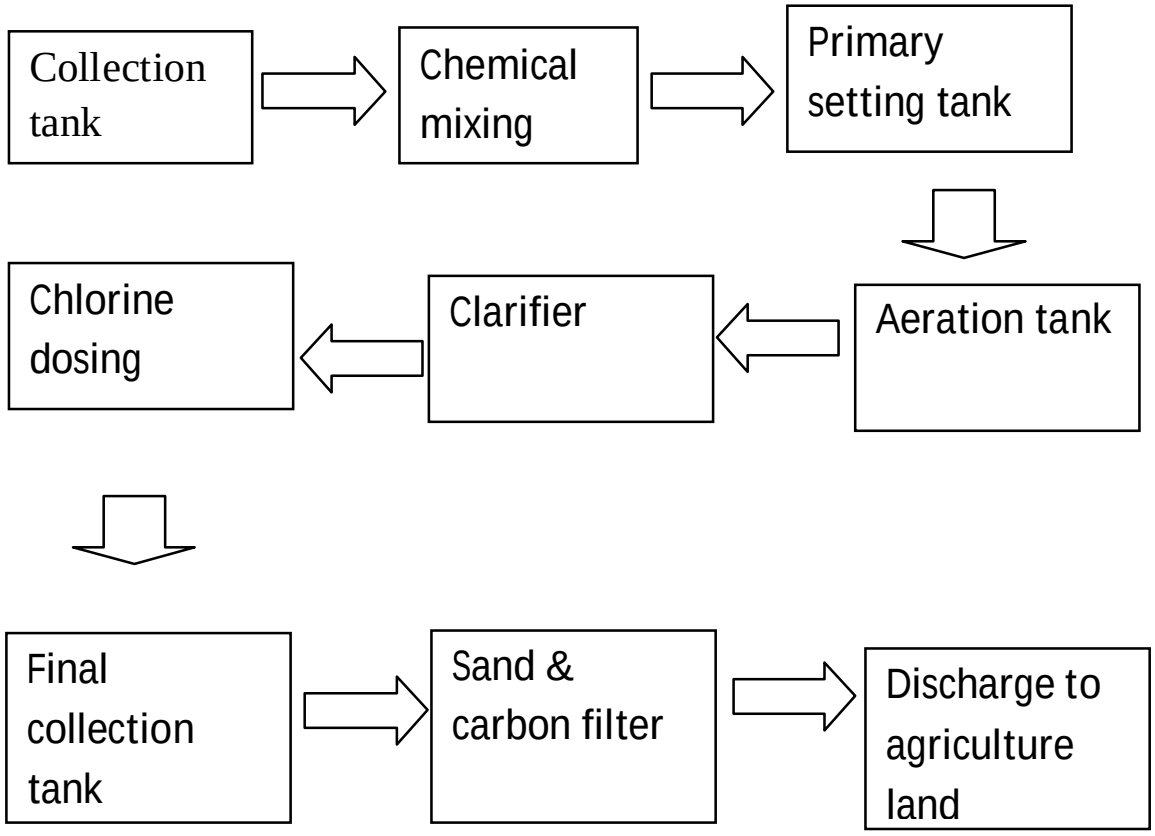
COLLECTION TANK

A collection tank is a large vessel.It is used to store oil, gas, and other products.In another manner, it is called as the unloading and re-handling tank. With the help of this tank, they are keeping the water that is separated from the rubber milk. Finally, these waters stored in the collection tank is going through the various process for the purification process. Water is collected in this tank and tested for acidic or alkali content.

ISSN:0971-1260

Vol-22-Issue-10-November-2019

Fig:1 EFFLUENT TREATMENT FLOW CHART



CHEMICAL MIXING

Chemical mixing is the process of adding or mixing chemicals to the collection tank in which a large amount of water is kept. By the way of adding the chemicals the water should easily get purified.

PRIMARY SETTING TANK

The Primary Setting tank is otherwise called as the sedimentation tank.They are designed to reduce the velocity of the wastewater flow. It helps in allowing heavier organic solids to settle down and the overflow of water takes place.

AERATION TANK

It is the tank in which the air or oxygen with bacteria content which can eat the sludge are injected. These bacteria eat the sludge and water gets purified

ISSN:0971-1260

Vol-22-Issue-10-November-2019

CLARIFIER

It helps in the removal of solids being deposited by sedimentation and helps in suspending solids from the liquids. Clarifier helps in the clarification for identifying whether the water is purified or not.

CHLORINE DOSING

Chlorine reacts with compounds in the water and it keeps the water disinfected.

FINAL COLLECTION TANK

This is where the water is collected after chlorination for the further filtration process.

SAND AND CARBON FILTER

Carbon filtering is a method that is used to filter the water. It uses a group of activated carbon to remove the impurities with the help of chemical absorption.

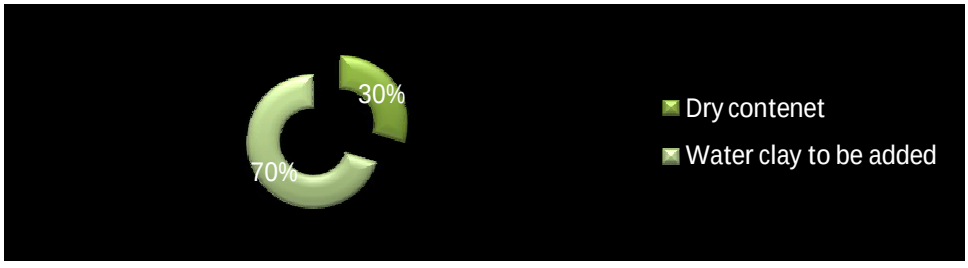
DISCHARGE TO AGRICULTURE

Finally, the purified water is used for agricultural purposes.About 2000 liters of purified water is used for agricultural purpose.The main concentration is given to the farmers,the process helps in the development of farming activities.

Table 4.1: Showing the contents of rubber after purification and water to be added

SI.NO	DESCRIPTION	PERCENTAGE
1	Rubber in purest form after the process of purification called dry content	30%
2	Percentage of water to be added	70%

Figure 4.1: Chart showing contents of rubber after purification and water to be added



ISSN:0971-1260

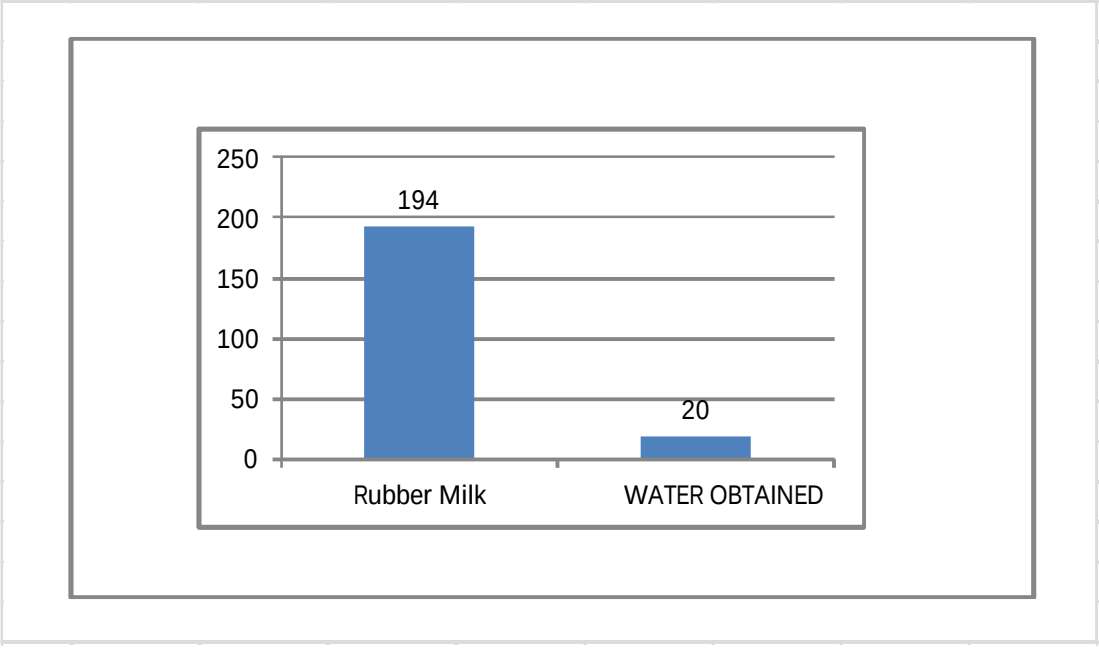
Vol-22-Issue-10-November-2019

From the above table and graph, it is clear that 30% is DRC[dry content] of the latex is obtained after the processing of latex in its purification process to which 70% of water to be added to make it ISO standard.

Table 4.2: showing the water and rubber milk composition in the tank

SI.NO	DESCRIPTION	QUANTITY USED IN LTS	QUANTITY USED IN KL
1	Rubber milk in the tank	194000 LITRES	194 KL
2	Water obtained after centrifuging	20000 LITRES	20 KL

Figure 4.2: Chart showing the water and rubber milk composition in the tank



The rubber milk is collected in the barrel. The water is collected in the collection tank. By analyzing the above chart it is clear that in the process of converting the latex to ISO standard 20000 liters of water is discharged as effluent for 194000 liters of rubber milk in the tank.

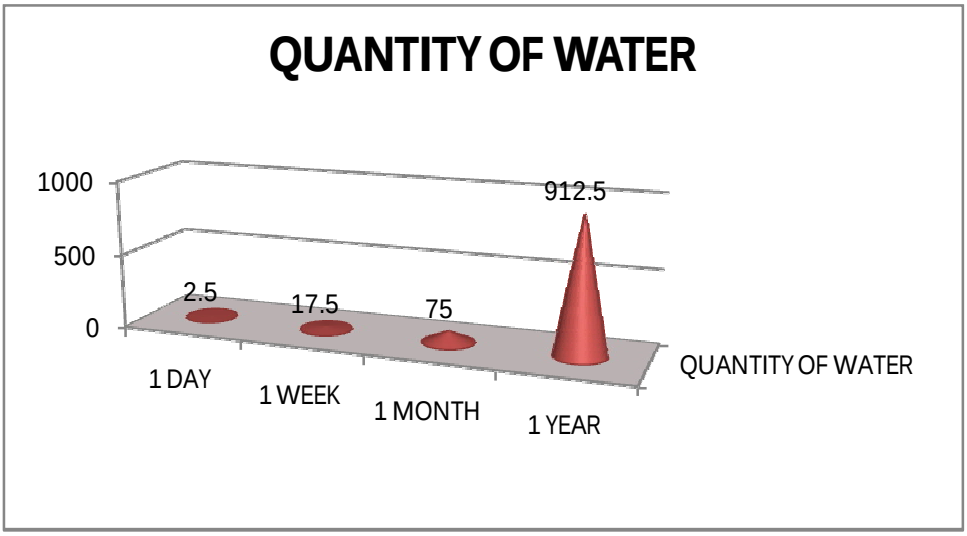
Table 4.3: showing the total quantity of water purified

ISSN:0971-1260

Vol-22-Issue-10-November-2019

SI.NO	PERIOD	QUANTITY OF WATER
1	1 DAY	2500 LITRES
2	1 WEEK	17500 LITRES
3	1 MONTH	75000 LITRES
4	1 YEAR	912500 LITRES

Figure 4.3: Chart showing the total quantity of water purified



One day they are purifying 2500 liters of water and for one week it is 17500 liters. Thus it should be 75000 liters for one month and yearly it should be 912500 liters of purified water.The above chart mentioned about the total quantity of water gets purified.

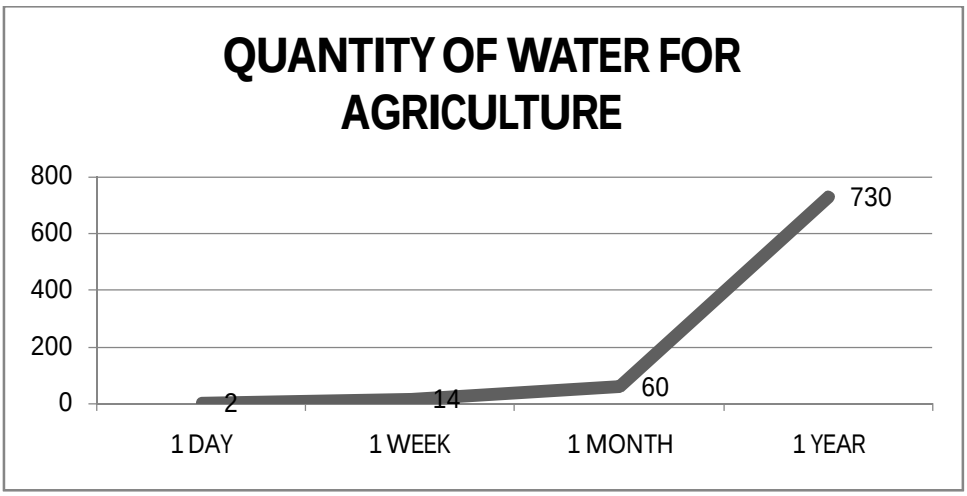
Table 4.4: showing the quantity of purified water sent to agriculture

SI.NO	PERIOD	QUANTITY OF WATER
1	1 DAY	2000 LITRES
2	1 WEEK	14000 LITRES
3	1 MONTH	60000 LITRES
4	1 YEAR	730000 LITRES

Figure 4.4: Chart showing the quantity of purified water sent to agriculture

ISSN:0971-1260

Vol-22-Issue-10-November-2019



The above table showing the quantity of purified water sent to agricultural purposes. After the completion of all the production, one day around 2000 liters of water gets purified. Similarly in a week, 14000 liters of water are purified. Thus the water is sent for various purposes mainly which is more helpful for the farmers. Around 60000 liters of water gets purified in a month and thus 73000 in a month. Thus through this process, no water is wasted. It is sent for useful purposes especially for the development of agriculture.

FINDINGS

The processed rubber will have 30% dry content where acidic water is added to make it into ISO standard product. For 194,000 liters of rubber milk, 20,000 liters of water are added. 2500 liters of water are purified every day out of which after domestic use 2000 liters of water are discharged for agriculture.

CONCLUSION

The water which is ejected from the latex processing process as an effluent can be transferred to potable water which could be used by the same factories for their domestic use purposes such as cleaning and toiletry use. The Kasargod latex factory is giving an example to all other rubber factories on how these wastes water can be converted to usable water and the water is sent for agriculture where it doesn't miss a chance of doing corporate social responsibility also. The other factories also must follow these models for the well-being of society.

ISSN:0971-1260

Vol-22-Issue-10-November-2019

REFERENCES

JOURNALS

- Dyann Rose(2017), "A research-informed model for corporate social responsibility: towards accountability to impacted stakeholders", International Journal of corporate social responsibility, 2017.
- Dibyendu Das, Ankuran Saha, Homagni Bhattacharjee(2016), "Rubber Processing is detrimental to the environment", International Journal of Scientific & Engineering Research, Volume 7, Issue 7, July-2016 369 ISSN 2229-5518
- K Syahputri, R M Sari, I Rizkya and I Siregar, "Identification and Waste Reduction on Rubber Industry", IOP for R&D.

WEB LINKS

- WWW.kasaragodrubbermarket.com

OTHER SOURCES

Organizations database of water purification chart

