



REVIEW AND STUDY OF WASTE MANAGEMENT SYSTEM OF RURAL AREA

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Abstract— Rural areas are lifelines of India. Focusing cities & towns have neglected the rural development. It can be seen that conventional & outdated systems are still present in remote areas that were appropriate earlier but they are unable to cope up with increasing population & various needs nowadays. Thus rural areas are in concerned areas not at great but smaller extent.

Keywords— . Rural, Conventional, Population.

and is non-toxic. Because of its environment - friendliness, composting is a highly suitable method of waste management in rural areas.

B. Liquid Waste

When water is used once and is no longer fit for human consumption or any other use, it is considered to be liquid waste. Wastewater can be sub categorized as industrial and domestic.

II. LITERATURE REVIEW

Introduction

Expanding urban areas, urbanization of rural areas will radically transform world in coming years. City or urban areas are expanding its limit up to rural areas. This rate of urbanization will definitely increase in near future. It will result in population inflation nearby cities, because the workers of industries are becoming inhabitants in or near rural areas. Sudden increase in population are resulting in unhygienic sanitary practices as the conventional methods are important for this new change. It is resulting in many health hazards. So, proper sanitation practices, water treatment, solid waste management, waste water management, etc. should be kept in check.

I. DEFINITION

A. Solid Waste

In rural areas, examples of solid waste include wastes from kitchens, gardens, cattle sheds, agriculture, and materials such as metal, paper, plastic, cloth, and so on. They are organic and inorganic materials with no remaining economic value to the owner produced by homes, commercial and industrial establishments. Most household waste in rural areas is organic, with little inorganic material,

1. CASE STUDY OF ISSUES IN SOLID WASTE MANAGEMENT RURAL AREA

Solid waste has become one of the biggest problem in both urban and rural areas of India. In rural area of **kadinamkulam panchayat in Thiruvananthapuram district, Kerala**, survey was conducted. To determining the types of wastes prevailing and the current practices carried out. The biodegradable wastes contributes to major portion of about 79.81% of the total waste generated per day. For the upcoming revealed that there should be proper management of both biodegradable and non-biodegradable wastes in rural areas. In rural areas there are two composting techniques like yard composting and bucket composting are best. The study shows that the waste generated per capita is 0.207 kg per day and 0.758 kg per day respectively, which is minimal when compared to urban areas.

2. STUDY OF BLACK WATER AND GREY WATER IN RURAL INDIA (MANAGEMENT OF GREY WATER – HARYANA VILLEGE)

Pond- Grey water treatment system in **kurak jagir village in karnal district, Haryana, absorbs grey water**. Studies show that more than 70% of fresh water across rural households in India gets converted to grey water. The gram panchayat (GP) of the village has been constructing pits- at the community and household level- that absorbs grey water. The gram panchayat houses 1600 inhabitants. The grey water is discharged into a pond-based waste water treatment system through a network of Storm water drains. Pond - based system treats waste water in a combination of three different biological processes using eco energy & Anaerobic, anoxic and aerobic. Up to 60 kilo-liters per day (KLD) grey water is generated in the Gram panchayat equal to the water supplied to a population of 400 in a class 1 City. The Gram Panchayat manages the solid waste, which prevent the clogging of drains and ensures a smooth and constant area. In kurak Jagin the treatment system comprises a series of pond systems, also called waste stabilization pond System.



[Fig.01 Worker Clean an Anaerobic Pond in Kurak Jagir Village in Haryana's Karanal District]



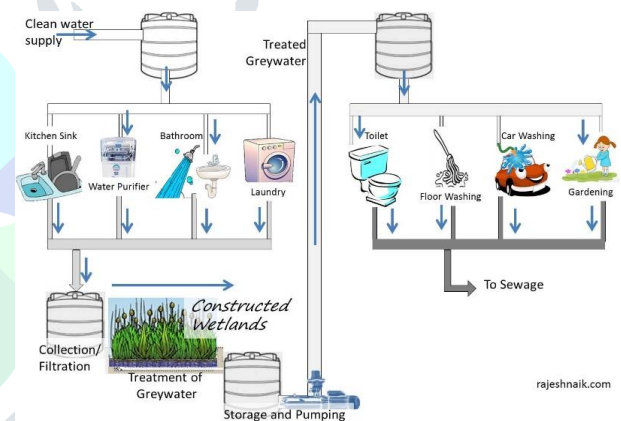
[Fig.02 A Maturation Pond is Used As A Pisciculture Tank in Kurak Jagir District]

3. ORGANIC WASTE MANAGEMENT STUDY

Organic waste management composting is a process which uses microorganisms present in organic matter and soil to decompose organic material. Vermicomposting is considered as a high nutrient bio fertilizer with diverse microbial Communities it plays a major role in improving growth and yield of different field crops, vegetables, flower and fruits crops. Vermicomposting is the process of conversion of organic wastes into finely degraded peat like substances using earthworms. It is an alternative method for waste management thorough which vermicomposting is produced with relatively high Nutrient content than compost and manures.

4. INTEGRATED SYSTEM FOR THE TREATMENT OF BLACK WATER AND GREY WATER VIA UASB AND CONSTRUCTED WETLAND IN CGYPT

In urban areas grey water is reuse as toilet flushing, which reduces water demand by 40-60 LPCD. Organic matter is further used as biogas as a Source of energy. Kordana (2015). It is suggested that the grey water recycling and economical use of rainwater can be a valuable alternative source of water. Especially for non-potable uses.



[Fig.03 Constructed Wetland]

5. LITERATURE STUDY OF GREY WATER MANAGEMENT AND TECHNIQUES.

When the grey water and toilet waste water kept separate then the pathogen load reduced. Therefore grey water being easier to treat and reuse. In 2025 India is going to crisis of water.

6. GREY WATER MANGEMENT BY USING STABILIZATION PONDS

In rural areas stabilization ponds are used as fish farming, which gives villagers an additional income source. Water scarcity, poor water quality and water related disasters are the three main concerns related to current and future water resources. It was seen that supply of water to the rural population has been a challenging task to overcome these issue Govt. is implementing the model for treating grey water.



[Fig.04 Stabilization Ponds]



[Fig.05 Stabilization Pond]

7. REDUCE, REUSE AND RECYCLE OF GREY WATER

Grey water can be utilized by using 3R i.e. Reduce, Reuse and Recycle. Toilets and clothes washers are two of the biggest users of water so the appropriate treated grey water further re-used as toilet flushing and clothes washing. When we use wastewater outdoor for gardens, it reduces household portable water use by 30 to 50%.

8. CASE STUDIES ON SEWAGE TREATMENT PLANT (STP) [DELAHAS, JAIPUR]

The STP collects water from 25km surrounding with gravity flow there is no pumping is used for sewage upliftment. In this plant the sludge is dewatered by using centrifugal pump and the thickened sludge is sent to dome, for anaerobic digestion. By this process gives biogas & digested sludge which use as manure by local farmers. The gas produce is using for revenue collection. In this case study check the use of treated water without any harmful cause to environment.



[Fig.06 Showing Automated Screening (Captured From the Site)]



[Fig.07 Inlet Section of STP]

9. EXPANSION OF S.T.P. FOR DHULIA CITY

This city is at developing stage having population up to 4 to 5 lakhs. Waste water is carried from main drainage line to old dhulia & the sushi nallah in deopur region & further meets at river Panzara. Due to this pollution is increasing day by day. So design & need to construct plan of STP at place where sewage water meets to the river Panzara.

10. STUDY ON SEWAGE QUALITY FROM SEWAGE TREATMENT PLANT. (SALIM ALI LACK, AURANGABAD)

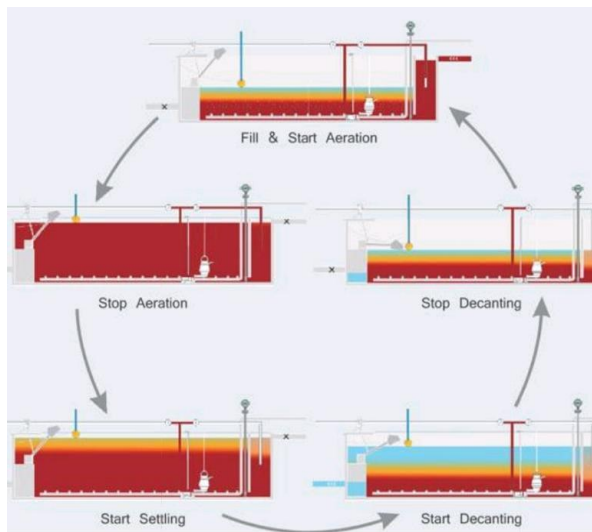
This plant is small 5MLD sewage treatment plant discharges treated water Salim Ali lake on daily basis. In this treatment plant cyclic activated sludge process is done. The process takes place in a single reactors. STP helps the water losses of the lack due to evaporation, evapotranspiration.



[Fig.08 Reactor at STP of Salim Ali Lake,Aurangabad]



[Fig.10 Panigram Resort Banquet Pavilion from Start to Finish]



[Fig.09 Working of Cycling Activated Sludge Proce]

11. ECO VILLAGE – THE PANIGRAM RESORT (BANGLADESH)

Eco village concept aim to generate less damaging impacts for nature and the environment. This eco village used ecofriendly building materials And organic farming for healthy crop production. These eco village also promote the use of shared vehicles for transportation, as well as common stores, cooking, utensils and central heating system to minimize. Environmental Impact and reduce cost.

12. GOVERDHAN ECO VILLAGE

Doors and window should be made from recycle wood. Fly ash cement should be used during construction, because less water is used in this cement. The innovative feature of CSEB block is that dust.



[Fig.11 The Govardhan Eco Village]



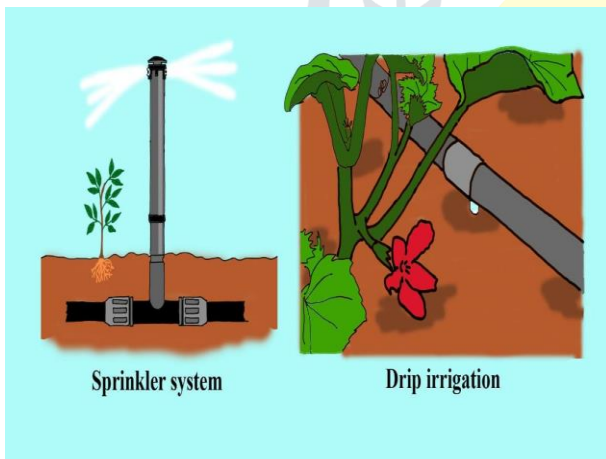
[Fig.12 Goverdhan Retreat Centre Goverdhan Eco Village, Galtare]

13. RAIN WATER HARVESTING

Rainwater can be harvested or by storage of rainwater on earth surface for future use or recharged to ground water rainwater harvesting help to overcome water scarcity and is the most reliable solution for augmenting ground water level to attain self-sufficiency in both rural and urban setting. Solar heater would be preferred for heating to avoid the use of fossil fuels. Farmers should be given to adopt such irrigation practices like drip and sprinkler irrigation which reduce the waste water.



[Fig.13 Rain Water Harvested in a Pond]



[Fig.14 Sprinkler System and Drip Irrigation]

14. LOW COST WASTEWATER TREATMENT TECHNOLOGY

In this research paper the investigation was held for using of cement kiln dust and wastewater treatment. The results showed that by increasing the dose of cement kiln dust, wastewater treatment affected greatly. The reduction of COD & BOD was 90.6% and 92.41% respectively with using 2.75.g/l cement kiln dust dose. Combination of cement kiln rice straw is considered as efficient & low dust & low cost technology for wastewater treatment & reuse. It was seen that use of rice straw in the filtration of waste water remove E-coli,

FC and listeria. This type of treatment enhances the quality of Wastewater for reuse.



[Fig.15 Cement Kiln Dust]



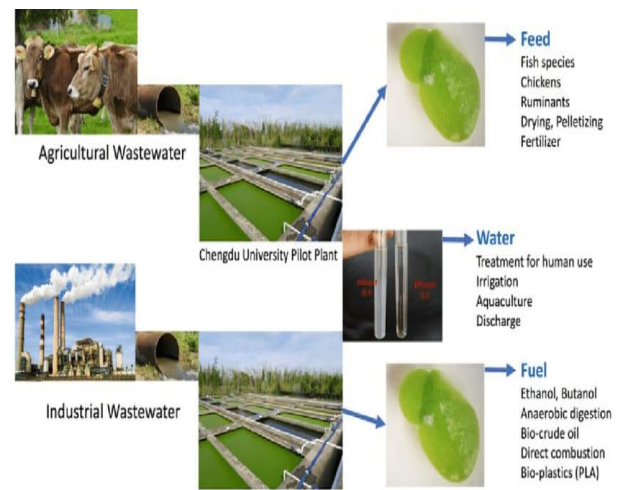
[Fig.16 Rice Straw]

15. A STUDY ON SIGNIFICANT USAGE OF TECHNOLOGY IN RURAL DEVELOPMENT WITH SPECIFIC REFERENCE TO INDIAN CONTEXT

Science & technology are key components for rural development because records show them of improving people's lifestyles. Technologies should be economically viable, useful & contribute to rural population's healthy lifestyle. Technologies that are low cost, low usage & making the most of these should all be incorporated. Proper use of available materials, energy will resources lead to successful low cost technology inventions. Technological development have contributed to creation of employment opportunities for rural people not only in agriculture but other fields too.



[Fig.17 Rural Development]



[Fig.19 Various Benefits from Duckweed Treatment]

16. LOW COST WASTEWATER TREATMENT AND POTENTIALS FOR RE-USE

Duckweed technology can be used for wastewater treatment outside the city, i.e. in rural areas land cost will be substantially lower & duckweed ponds may become feasible. Anaerobic treatment facilities, requiring only limited pace may planned at convenient locations in or near the city. The duckweed harvested at regular intervals can be used to cultivate fish in adjacent ponds, while the effluent can be made available for irrigation. The possible production of malicious odors from the wastewater is effectively reduced by the presence of a duckweed cover on the pond surface. The Income from products generated the duckweed system has potential to become a commercial enterprise generating substantial revenues.



[Fig.18 Duckweed]

III. CONCLUSION

The provision of hygienic practices are accepted all over India. Various steps are taken by India's state, central and local government to address various issues regarding sanitation, waste water treatment, safe drinking water to tackle them not only on urban but also in rural areas. Many civil societies and communities are working to create awareness for new and low cost technologies for rural areas. Development doesn't need to be high investment be every time but can be low cost with providing with various benefits to population while being environment safe.

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