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A Bio-Waste Fuel: An Alternate Source of Fossil Fuel

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ABSTRACT: The invention describes the procedure of making dump into compressed coal which can be used as the burning substance in industries as well as it can be also used as burning lubricant in thermal power plants while burning the coal, we can get a greater amount of fumes which can further generate energy. This energy generation is more compared to bio-coal and briquettes as we get more combustible materials from legacy. It consists of plastic, rubber, wood, glass, metals, paper and other biological compound. this coal is also fragrance coal thus does not affect nearby area with some pollutants.

KEY WORDS: Recycling, waste controlling, energy generation, compressed coal & Renewable energy source.

I. INTRODUCTION

Present process relates to method of preparing coal-like fuel from waste; which is economically and eco-friendly specifically it is method of development of compressed coal-like fuel for energy source and flaming objects. It's basic background is rapid use of fossil fuels; especially coal for energy generation, has raised concerns for future .it has already resulted in crisis. It is really important that alternative energy generation sources are developed. with the huge demand of such energy generation source, it is also important that they are formed form the resources that are available in the bulk and reasonable costs.

There are many incidences where people have tried to used waste to produce fuel. that would also solve the requirements of waste recycle. but even in presence of these methods, there are still lot of waste dumps everywhere causing environmental pollution even if they are burnt.

According to India today article [India trash bomb: 80% of 1.5 lakh metric ton daily garbage remains exposed untreated. worse - approximately 90 percent (1, 35,000 MT per day) of the total amount is collected waste. At times the "highly polluting" unprocessed solid waste in the dump sites reaches 3cr MT. The solid waste in landfills sites and the uncollected trash-of the total 5.4cr MT of solid waste generated annually -4.5 crore MT are unprocessed"]. At times only particular type of waste is being recycled as the recycling various dump elements are based on requirements of certain small-scale industries. further ,in plastic recycling process there is adverse effects on land as they are being used for road making it reduce the fertility of the land .it also causes many health issues for example ,while making the shoes from the fresh wastage of plastic .one more major limitation of recycling various elements is the dump should be fresh and is if it's being stable for month and the elements which is needed to be separated then the particular things made from recycling process is not effective as compared to fresh dump. On the bases of current recycling being recycled rest, all stable at wasteland (dumping sites).

On the current legacy cleaning all the waste is being crushed and strained such mud structure is being spread over the land or being transferred to another area where required, remaining all the waste is being fired or sometimes it catches the fire automatically in presence of the wind as there some gaseous form in stabled dump with this some of the dump is digged into the land as there is huge hip of waste. Therefore, the current crises of fuel and troubles in waste management demands a method that can efficiently use waste to produce co-like fuel that can generate energy ;economically and eco-friendly.



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II. SIGNIFICANCE OF THE DUMP RECYCLING SYSTEM

Waste management reduces the effect of waste on the environment, health, and so on. It can also help reuse or recycle resources, such as; paper, cans, glass, and so on. There is various type of waste management that include the disposal of solid, liquid, gaseous, or hazardous substances. There are many things that need to be taken into consideration when discussing waste management, such as disposal methods, recycling methods, avoidance and reduction methods, and transportation of waste. The process of waste management involves treating solid and liquid waste. During the treatment, it also offers a variety of solutions for recycling items that aren't categorised as trash.

III. LITERATURE SURVEY

In 2007 Sharholy and Ahmad gives a review report over Municipal solid waste management in Indian cities. In his report they discuss about the Qualitative and quantitative analysis, characteristics and composition, Storage and collection, Transfer and transport, disposals and treatment of Municipal Solid Waste. The study is concluded with a few fruitful suggestions, which may be beneficial to encourage the competent authorities/ researchers to work towards further improvement of the present system.

Vikash and Shreekrishnan 2008 evaluate the present state of municipal solid waste management in Delhi. Since Delhi is the most populated and urbanized city in India about 3.85% 3.85%, almost double the national average. Delhi is also a commercial hub, providing employment opportunities and accelerating the pace of urbanization, resulting in a corresponding increase in municipal solid waste (MSW) generation. Presently the inhabitants of Delhi generate about 7000 tonnes/day of MSW, which is projected to rise to 17,000–25,000 tonnes/day by the year 2021. MSW management has remained one of the most neglected areas of the municipal system in Delhi. About 70–80% of generated MSW is collected and the rest remains unattended on streets or in small open dumps. Only 9% of the collected MSW is treated through composting, the only treatment option, and rest is disposed in uncontrolled open landfills at the outskirts of the city .they also summarizes the proposed policies and initiatives of the Government of Delhi and the Municipal Corporation of Delhi to improve the existing MSW management system.

Hazra and goel 2009 gives an overview of current solid waste management (SWM) practices in Kolkata, India and suggests solutions to some of the major problems. More than around 2920ton/day of solid waste are generated in Kolkata Municipal Corporation, 6070% are collected with the deficient in terms of manpower and vehicle availability. And conclude Lack of suitable facilities (equipment and infrastructure) and underestimates of waste generation rates, inadequate management and technical skills, improper bin collection, and route planning are responsible for poor collection and transportation of municipal solid wastes.

Kumar and goel analyzed Municipal solidwaste (MSW) management practices in Kharagpur, a small city inWest Bengal and propose integrated solid waste management plan. 45mt/d solid waste is collect by Municipal Corporation out of 95mt/d Most of this waste is dumped on open land and in natural and engineered drains, thus blocking the flow of storm water and contaminating groundwater. Other major problems include inappropriate bin locations and poorly designed community bins, collection vehicles that are in poor condition, inadequate labor for collection and transport of waste, and lack of waste treatment and disposal facilities. 12 samples are collect and tested and various parameters such as moisture content, total solids, fixed solids, organic carbon, volatile solids and calorific value are analyzed and revealed that Kharagpur has high moisture content and low calorific value, making aerobic composting the best treatment strategy. Composting can help to divert more than 80% of the total waste and will lead to enormous savings in costs of waste collection, transport and disposal. The remaining waste can be disposed off in an engineered landfill. Augmentation in labor and vehicle inventory has been proposed along with better treatment and disposal facilities.

Narayan gives a comparative report on Landfills, Incineration, and Composting practices in india from Municipal solid waste management - From waste disposal to recovery of resources. Keeping in mind the costs that would be incurred by the respective governments, and identify the most economical and best option possible to combat the waste disposal problem. Seema 2010 focus into the clean development mechanism (CDM) projects involving energy recovery from



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municipal solid waste (MSW).in her work comparing of Municipal problems, regulatory framework in place and the CDM opportunities in India, also explain RDF, composting and landfill gas recovery methods. Comparative Case study is also taken in consideration between brazil and India and revealed that the India does not have well designed sanitary landfills where methane can be captured. India needs to make conscious effort towards developing more scientific landfills, capture methane and take carbon credits. Dimpal 2012 presents a report on Urbanization and solid waste management in India. In his report she describe how the urbanization High rate of population growth, declining opportunities in rural areas and shift from stagnant and low paying agriculture sector to more paying urban occupations, largely contribute to urbanization The unexpected immigration has also caused the burgeoning of slums and the growth of squatters and informal housing all around the rapidly expanding cities of the developing world. Urbanization directly contributes to waste generation, and unscientific waste handling causes health hazards and urban environment degradation. Solid Waste Management which is already a mammoth task in India is going to be more complicated with the increase in urbanization, changing lifestyles and increase in consumerism. Financial constraints, institutional weaknesses, improper choice of technology and public apathy towards Municipal Solid Waste (MSW) have made this situation worse. At her report evaluates the current practices prevalent in India to deal with this solid waste and problems associated with it. It also provides the measures to deal this waste in healthy and environment friendly manner so that it may prove a resource instead of waste.

IV. METHODOLOGY

According to the deposition and type of waste, different techniques are used for waste management. They may vary from person to person, place to place, time to time and nation to nation. They are:

Recycling:

Collecting the wastes from different places and segregating them according to the nature of products and used for recycling process. Robots are used in America for collecting the wastes in Baltimore River. In Malaysia and Hong Kong, recycling process is practiced for controlling the construction wastes (Wahi, et.al., 2016). Recycled the municipal and construction solid waste and used it for manufacturing highly environmentally friendly geopolymer composite (Tang, Tam & Xue, 2020).

Composting: -

Organic wastes are separated from the wastes and allow decomposing by microbes for a long period of time in a pit. Then this becomes nutrient rich compost and used as manure for the plants. Soil fertility is enriched by these manures. Composting through biological technique progresses the fertility of the soil. Vermicomposting method reduces environmental impact and enhances the nutrient content of the soil (Bhat, et. al., 2020). Vermicomposting is the effective process for sustainable organic agriculture and for also to maintain a balanced ecosystem (Kaur, 2020). For high level of organic waste reduction and rapid composting time, Black Soldier Fly (Larvae) was used. Then the residues were further treated with *E. Eugeniae* which results in the production of best quality of vermicompost (Bagastyo & Soesanto, 2020). Vermicomposting of onion waste with cow dump produces a valuable agricultural enriched nutrient circle (Pallejero, et.al., 2020).

Landfilling: -

Dumping the wastes in the soil is called as Landfilling. Proper procedure should be adopted for landfilling such as lining the base with protective layer, selecting low groundwater level area, etc. Skilled manpower is needed for this process. In China, construction of horizontal wells reduces leachate level in landfills containing municipal solid waste (Hu, et. al., 2020). Physical, chemical and biological processes-based model controls the Hg emission from landfills (Tao, Deng, Li & Chai, 2020). The results of co-incineration of sewage sludge and municipal solid waste showed more gaseous Hg⁰ to be oxidized to Hg²⁺ during the cooling process. It leads to cause less environmental risk to the atmosphere (Sun, et. al., 2020).

Incineration: -

Burning the wastes at high temperature is called as Incineration. To avoid air pollution (caused during burning of wastes), proper filters are used. For handling sludge, direct incineration method without anaerobic digestion was found to be more



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preferred sustainable approach (Hao, et. al., 2020). For fossil fuel conservation and waste disposal, the technology of coal power plant along with waste incineration method was considered as a promising technology (Ye, et. al., 2020). Degradation technologies such as plasma, mechanochemistry, hydrothermal, photocatalytic and biodegradation had proved that they have good purification effect and are considered as the best resource of MSWI fly ash (Zhang, Zhang & Liu, 2020).

Bioremediation: -

Process of using microbes and bacteria for removing the impurities, pollutants and poisons from soil, water and other environments is called as bioremediation. Energy power generation plants emit radioactive wastes which is the major threat to the human population. To reduce these wastes, bioremediation strategy is used. Bioremediation technologies rectifies the heavy metal pollution problem and helps to regain the natural condition of soil (Saini & Dhaniala, 2020). Bioremediation is an eco-friendly, inexpensive, and effective technology which is encouraged for the safe discharge of water from industrial activities (Coelho, 2020).

Waste-to-energy: -

Waste-to-energy is the process of creating energy in the form of electricity or heat from the primary treatment of waste. In China, anaerobic digestion technology is used for energy recovery and also has been identified as an effective approach to minimize the degree of harm of GHG emissions which are related to FW treatment (Zhang, et. al., 2020). Waste-to-energy (WtE) technologies such as pyrolysis, gasification, incineration, and bio-methanation can convert MSW, as an appropriate source of renewable energy, into useful energy (electricity and heat) in safe and eco-friendly ways (Malav, et al., 2020).

Remote Sensing & GIS: -

Remote sensing is the art of obtaining information about objects or areas from a distance, typically from aircraft or satellites. In Coimbatore landfill sites, 75% of municipal solid waste were dumped without treatment and it was found out by using vector data and remote sensing (RS) (Gautam, Brema & Dhasarathan, 2020). Remote sensing is an avenue to quantify process-level emissions from waste management facilities (Cusworth, et al., 2020). Use of remote sensing and GIS for distinguishable proof of the sensible objectives of solid waste dumped depends on the overlaying of datasets and spots that fulfil the site suitability criteria. The datasets and spots join the spatial examination devices given by GIS to arrange and survey in order to choose possible waste areas (Vishnuvardhan & Elangovan, 2020).

V. EXISTING TECHNOLOGY

As there is much solution to clean dump by various recycling but yet it is presence of the dump and many humble effects of environment due to its stability. and only partial dump is being recycled as the recycling various dump elements are based on small scale industries. and in plastic recycling process there is adverse effects on the land as they are being used for road making it reduce the fertility of the land. It also causes many health issue while shoes making from the fresh wastage of plastic . one more major limitation of in recycling various elements is the dump should be fresh if its being stable for a month and the elements which is need to be recycled is not separated than the particular things made up from the recycling doesn't be effective as compared to preferred fresh dump. On the bases of current recycling of the waste products only 45% of it is being recycled rest all are stable at waste land(dumping sites). Till day recycling cost is much higher and much machinery to be manages than too we didn't reach out with satisfactory recycling.

According to the figure (fig1.1) we get the identification of the presence of the plastic in the dump thus bases on that we have many recycling process on dump .finally the remaining dump is being classified in legacy figured (fig.1.2) denotes the waste presence in after recycling procedure. It clearly shows the presence of plastic in dump quantity which is strictly needs to be extracted for the biofuel.

The present research opens the path for further research. Various case studies and empirical studies are available in the area of managing solid waste. However the underlying reasons are not very much clear why most of the waste to energy plants are non-operational or shut down. Authors propose mixed research methodology using ISM and confirmatory factor analysis to find out the major factors and interrelationships influencing waste to energy plants.



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VI. CONCLUSION AND FUTURE WORK

To live a healthier life proper waste management technique is essential. Through Reduce, Reuse and Recycle, we can conserve the natural resources and saves energy. Composting enriches nutrients to the soil, decreases the landfill wastes, keeps more microorganisms to be present in the soil and makes pollution free environment. In Landfills, a latest technology is used and helps in energy production such as methane in large amount. Incineration decreases the amount of solid waste, helps in the production of heat and energy, reduces pollution and makes the place environment friendly. Bioremediation is a natural process, minimum equipment and little energy is needed, without harmful side effects, quickly makes soil and water more useful, etc. Waste-to-energy minimizes greenhouse gases, produces clean energy and reuses metals. Remote sensing helps to collect information about the large spatial areas and to characterize the natural features of the objects. This information helps to make decision about physical objects. GIS provides detailed information about the location and helps to make decision about it. Waste management techniques keeps the environment free from pollution, increases the fertility of the soil and groundwater level and saves the earth and energy sources. These waste management techniques are considered as the best methods to safeguard our environment. Clean and green environment is the greatest assets for our forthcoming generation. To achieve this, environmental guiding principles, values, policies and legislations should be framed properly and followed strictly for eco-friendly sustainability.

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