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Utilization of Agro-Wastes for Sustainability of Environment- A Short Review

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ABSTRACT

Agricultural waste burning releases air pollutants like carbon monoxide, carbon dioxide, oxides of nitrogen and sulfur and also smoke. These pollutants are the cause of acid rain. To overcome this problem it is essential to use the agricultural wastes as functional substitute in different useful activities. So farmers do not burn or bury their waste materials or put agricultural wastes into the household dustbin. In view of the conservation of resources and energy, efficient recycling of agro-wastes is the important work of researchers and requiring extensive R & D work towards exploring newer utilization and maximizing the use of technology for a sustainable and environmentally friendly management. This reviewed approach on agricultural wastes is useful to provide potential and sustainable solution to give a green, clean and healthy environment to modern civilization.

Keywords--- Agricultural waste, pollutants, sustainable, environment, civilization

I. INTRODUCTION

Today's world is facing a great problem for conserving our environment from non-degradable substances which can send us to a darken realm where none can save our wonderful earth. The rapid growth of World's population and rapid increase of urbanization has increased the demand for food which produces large amount of agricultural wastes. Agricultural wastes are by-products produced at agricultural premises as a result of agricultural activities it can be husk, straw, fibres, hulls, bagasse, leaves etc. It is calculated, we get 998 million tonnes of agricultural wastes globally per year. Different factors create a problem in developing countries for utilizing agricultural wastes or recycling the agricultural wastes into other forms of utilization. Agricultural wastes are biodegradable and eco-friendly, but it creates pollution in water bodies and atmosphere by spreading foul smells. These adverse effects of agricultural wastes are due to lack of proper planning of waste management, poor public awareness, government policy and insufficient laws. There are different types of agricultural wastes but in this review we discuss only a few types of agricultural wastes in different fields and their novel utility (figure 1). This review may give other researchers as a good piece of information and enhance the ability of researchers to utilize agricultural wastes into something new by which we can conserve our environment and poor people can get an additional value for their unused materials.

II. GRAPHICAL REPRESENTATION OF REVIEW WORK

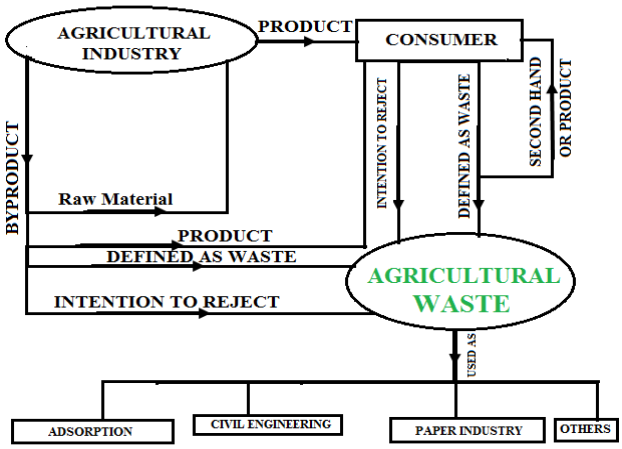

Figure 1 Scheme of formation of agricultural wastes and its utility

III. ADSORPTION

Metals belong to d-block of periodic table are called heavy metals, because their specific gravity is five times more than that of water. Heavy metals are toxic and non-degradable. So these are harmful for both human and aquatic life. It is necessary to remove these heavy metals economically. In this context researchers used different agro-wastes successfully and efficiently through adsorption. Adsorption is the phenomenon using in gaseous phases, but it is effective for water and waste water treatment. Water melon shell (WS) [1] Chitosan/Sisal/Banana fibre hybrid [2] used for removal of Cu (II) from aqueous solution. Modified Oil Shale ash [3] and ceratonia salique bark [4] are good adsorbent for removing heavy metals with high correlation values which obey pseudo second order kinetic model. Durian peels [5] are used for adsorption of cadmium, Neem leaf powder [6], hazelnut husk [7], palm shell [8], saw dust [9], yeast biomass [10], orange peel [11], bamboo [12], guava seed [13], sugarcane bagasse [14], and rice husk [15], etc are used for removal of heavy metal ions successfully.

IV. CIVIL ENGINEERING

Bricks plays an important role in construction industry, but none is able to know what will happen when construction become unused. For solving this problem some researchers prepare bricks using agricultural waste materials like sugarcane bagasse ash [16] in clay bricks. It showed highly positive result in terms of environmental protection and waste management. Similarly many research works have been done successfully using coconut shell [17] in the construction industry which reduced the cost of construction material and also disposal problems. Coconut shell exhibits greater resistance against crushing, impact and abrasion, compared to crushing granite aggregate. The combination of coconut shell and grained palm kernel shell [18] has potential as lightweight aggregate in concrete which is cost effective and eco-friendly.

V. PAPER INDUSTRY

To fulfill the demand of paper and paper board of modern civilization, developing countries use non wood fibres as the source for preparing pulp in paper industry. Generally sugarcane bagasse [19], whole cotton stalk [20], whole kenaf stalk [21], rice straw and wheat straw [22], etc are used for preparing pulp in paper industry which are low cost materials and green in nature. Nonwoven textiles kenaf fibres are used for letterhead quality paper and whole kenaf stalks are used to prepare newsprint grade paper.

VI. CONCLUSION

The above study revealed that it is necessary to take interest, training and developing technologies to utilize the agro-wastes in the realm of commerce world by which non-degradable substances are replaced by green substances and sustainability of environment will increase. World becomes free from mouth of fear of destructive pollution and becomes clean, green forever.

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REFERENCES

[1] K Banarjee, ST Ramesh, R Gandhimathi. PV Nidhesh and KS Bharathi, Iranica J of Energy & Environment, 2012, 3 (2): 143-156.
[2] KB lakshmi and PN Sudha, International J of Environmental Science, 2012, 3 (1): 453
[3] I Ali, M Asim and TA Khan, J of Environmental Management, 2012, 113: 170-183.
[4] VO Arief, K Trilestari, J Sunarso, N Indraswati and S Ismadji, CLEAN-Soil, Air, Water, 2008, 12: 937-962.
[5] W Saikaew, P Kaewsarn and U Ratchathani, Durian peel as biosorbent for removal of cadmium ions. Under the class of agricultural wastes including, 2010, 32: 17-30.
[6] KG Bhattacharya and A Sharma, J of hazardous materials, 2004, 113: 97-109.
[7] M imamoglu and O Tekir, Removal of Copper (II) and Lead (II) ions from aqueous solutions by adsorption on activated carbon from a new precursor hazelnut husks, 2008, 228: 108-113.
[8] G Issabayeva, M Kheireddine and N Meriam, DES, 2010, 262: 94-98.
[9] GK Sreejalekshmi, KA Krishnan and TS Anirudhan, Adsorption of Pb (II) and Pb (II)-citric acid on saw dust activated carbon: Kinetics and equilibrium isotherm studies, 2009, 149: 1506-1513.
[10] AH Sulaymon, SE Ebrahim, TJ Musawi and SM Abdullah, Removal of Lead, Cadmium and Murcury ions using biosorption, 2010, 11: 1-13.
[11] N Feng and X Guo, Transactions of Nonferrous Metals society of China, 2012, 22:1224
[12] BH Hameed, ATM Din and AL Ahmad, Adsorption of methylene blue onto bamboo-based activated carbon: Kinetics and equilibrium studies, 2007, 141: 819-825.
[13] P Taylor, O Abdelwahab, A El Sikaily, A Khaled and A El Nemr, Mass-transfer processes of chromium (VI) adsorption onto guava seeds, 2008, 37-41.
[14] V Vinodhini and N Das, ARPN J of Agriculture and Biological Science, 2009, 4 (6)

[15] KS Raju and SV Naidu, J of Chemical, Biological and Physical Sciences, 2013,3:602-606
[16] KCP Faria, RF Gurgel and JNF Holanda, " Recycling of sugarcane bagasse ash waste in the production of clay bricks" J of Environmental Management, 2012, 101: 7-12.
[17] VP Kukarni and SK Gaikwad, Inernational J of Engineering and Innovative Technology, 2013, 2 (12)
[18] SAB Tukiman and SB Mohd, " Investigate the combination of coconut shell and grained palm kernel to replace aggregate in concrete: A technical review" National Conference on Postgraduate research, 2009
[19] F Peng and R Simonson, "High-yield chemimechanical pulping of bagasse. Part 4 Bagasse CMP with sodium hydroxide/hydrogen peroxide pretreatment, Appita J, 1992, 45 (2): 104-108
[20] F Mubarak and AM Nada, J of Applied Chemistry and biotechnology,1975, 25(9):659-65
[21] PJ Lamahieu, ES Oplinger and DH Putman, AJ. Ternative Field Crops Manual:Kenef, University of Wisconsin-Madison Ext. Publ. Aplil-1991
[22] GC lindgren and M Lindstrom, " Kinetics of wheat straw delignification in soda and kraft pulping", J of Wood Chem. Technology, 1998, 18 (1): 69-82.