Agriculture waste management for sustainable use

Agriculture is the backbone of many developing nations and is one of the largest contribute to the resource sector. With the increase of the population , there is a rise in demand for food and food production .Modern agriculture use the latest farming technique along with the artificial fertilizers. Such change in production method resulting in larger quantities of food production . The main objective of the method is to achieve a greater output from a given amount land, labour and capital resource. Mechanization of agriculture implies the application of modern technology to agriculture. Further, the knowledge of agricultural new method is more patinent in the context in view of India’s population has remarkably expanded from 369.88 million (in 1947) to 1173.10 million by 2010 and expanded to be more than 1460.74 million by 2030 and 1656.6 million by 2050 with the population growth rate of 1.2% in India. In general agricultural method is of two types-firstly, technologies which can change the use of given bundle of resource which means the proportion of input remain remain while the output increases.secondly technologies bringing about changes in the composition of resource used, it means that the proportion of resource used. Input may be substituted in varying amounts and recombind in varying amount and recombined in such a way that output increases relative to the amount of input used.

In agriculture , knowledge and decision making capacity determine how production factor are utilized. Expanding of agricultural production has naturally resulted in the increase quantities of livestock waste , agriculture crop residue and agro- industrial by -products. There is likely to be significant increase in agricultural waste globally if developing countries to intensify farming system .It is estimated that about 998 million tones of agricultural waste is produce yearly. After china , India is the second largest producer of agricultural waste , and produce over 130 million tones of paddy straw out of which half is used in fodder and the half is discarded and burned which creates sustainable air pollution and raise health concern. These waste contain material that can benefit man but whose economic value are less than the cost of collection, transportation, and processing for beneficial used. It has enormous potential when appropriately managed.

Man has ever been continuously looking forward for a new improved way of producing good and service. As since the agriculture is one of the largest biological sector producing highest biomass, which can be input for the bioeconomy. The agricultural waste management based bioeconomic strategies can prevent and utilization of livestock excrement and reckless or random burning of crop residue to ensure food and health security, waste valorization to generate value added products , farmer’s livelihood , job opportunities for youth, and sustainability in agriculture and the environment. In other words , agricultural waste management is a planned system in which all necessary component are install and manage to control and use by product of agricultural production in a manner that sustain or enhances the quality of air, water, soil, plant, animal and energy resources. All the management practice the principal of 3Rs- Reduce, Reuse, and Recycle. The concept of minimizing waste reduce the quantity and ill effect of waste generation by reducing quantity of waste ,reusing the waste product with simple treatment n recycling the waste by using it as resource to produce same or modified product. For production of different goods or the same product, meaning recycling the same source . when waste are reused time and again, its offsets harvesting of new similar or same product. This save fresh resource exploitation and reduce waste generation. All in all, the 3Rs individually or collectively save fresh resource exploited resource and very importantly minimize the waste quantity and its ill effect. The 3Rs aim at achieving efficient minimization of waste management s choosing to use items ith care to reduce the amount ofwaste itself as resources .

Types of Agricultural waste

1. Crop residue : Stalk, leaves, husks and straw that remain after harvesting wheat , rice, corn, sugarcane and others.
2. Animal manure : Feces, urine, and bedding materials.
3. Agrochemical containers of pesticides, herbicide and fertilizers.
4. Harvest and processing waste : Fruit peel, vegetable trimming, damage , by products from food processing.
5. Left over feed : Grains, forages and other feed materials
6. Packing materials :Plastic bags ,cardboard boxes and containers.
7. Green waste : Trimming, pruning, plants debris ,leaves , branches and grass clipping.

Agricultural waste and its effect in the environment

 The rapid increase in the world population couple by urban migration has resulted into and increase demand for food which in turn led to the production of large amount of waste , both the farmer , municipality and the city level. Although it is recognize that the accumulation of waste has enormous ill effect on human and the environment. The burning of waste as fuel is one of the oldest biomass conversion process known to mankind. Complete combustion of agrowaste consist of the rapid chemical reaction of biomass and oxygen, the release of energy and the simultaneous formation of the ultimate oxidation products of organic matter – CO2 and water .According to agricultural waste burning , release the pollutants such as carbon mono-oxide, nitrous oxide, nitrogen dioxide and smoke carbon. These pollutant to acid deposition t are accompanied by the formation of ozone and nitric acid, hence contributing acid deposition thereby posing risks to human and ecological health. Environmental pollution from animal waste is a global concern and is much more acute and serving in countries with high concentration of animal on a limited base for manure disposal. Animal waste are excreted in solid , liquid, and gaseous form. After excretion, solid and liquid animal conversion which convert organic substrates into microbial biomass and soluble and gaseous product. Some of these products have impact on the environment , as well as water quality, soil deterioration and air pollution. Respiration and fermentation are lost to the environment after being produce by the animal. Additionally, the application of excessive animal wastes on land as fertilizer and soil condition is subject to runoff and leaching that may contaminate ground or surface water.

Agricultural waste Management method

Agricultural waste management must be either use the residue under condition that do not cause spoilage or render the residue unsuitable for processing to the desire end products. This method includes the following :

1)Composting : Composting is an effective solution for managing plant residue , trimming, manure and other agricultural products which decomposed into nutrient rich compost .The compost and the organic fertilizer made with agricultural waste improve soil fertility, increase crop production ,and reduce the need for synthetic chemical fertilizer.

2)Biogas : Production of biogas not only help and manage agricultural waste effectively but also improve living condition by providing access to cleaner and more efficient energy production, reducing air and waste pollution and uplifting the overall quality of life.

3)Mulching : Agricultural solid waste use as mulch help conserve soil moisture, suppress weed growth and enhance nutrient retentation.It is much effective for straw ,hay , crop residue , leaves and also help in soil moisture.

4) Fermentation : Fermented crops produce biofuel like ethanol or biodiesel.

5) Gasification : waste can be converted into a gas mixture , the syngas.

6) Recycling : Proper recycling involves collecting , sorting and processing plastic material to transform them into new products or raw material for manufacturing which can be contribute to the circular economy , reducing the demand for new raw materialsand conserving natural resource.

Agricultural waste and food security

 Agricultural waste can be used to enhance food security mainly through their use as biofertilizer and energy production that is utilized to varying degrees in different parts of the world.

In future biotechnology method will be utilize to extract high value bio- products from agricultural waste because of their low energy requirement and low cost integrated nano and biotechnological technique are preferred for industrial waste valorization. Furthermore, biotechnological method are viable solution for developing unique bio-products for a variety of industries . Therefore, it is necessary to make eco friendly and cost effective conversion technique to economic and environmental issue.

Conclusion :

Agricultural waste can be a valuable resource for improving food security however if not treated or disposed off properly , likely to cause pollution to the environment .systematic utilization of waste help to improve environment condition by reducing pollution and can be transformed into beneficial material for human and agricultural usages . Proper utilization will assist in developing agricultural sector .The problem of processing can only be solve in n integrated way in linking the legislature , economic and technological component. Valorization through biotechnological and green approaches are helpful in bioproduct development in a cost effective and comprehensive way. In order established a safe and green environment, it is beneficial to recycle waste from the agricultural and agro- based sectors and use them as feedstock for development

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