

Agricultural Waste or Wonder

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Abstract

India is an agricultural country and its economy is dependent on agriculture. Advances in agricultural sciences, the green, golden and white revolution resulted in increase in the food production. India became self-sufficient and also started export of food and fruit. As a result of technological advancement along with the use of chemical fertilizers, herbicides and pesticides, India at present is capable of food production in huge quantities, so much so, we fall short of go downs now infrastructure for the same is being provided by the government. We have become self-sufficient at the cost of environmental pollution. One of the reasons being agricultural wastes which are generated as a result of agricultural operations. It is estimated that annually 600 million tons of agricultural waste is being produced which at places is being burnt, resulting in poor quality of air, agricultural wash off getting dumped into water bodies resulting in water pollution. Due to monoculture most of the soil is getting depleted of some of the essential nutrients. Besides the indiscriminate use of chemical fertilizers, pesticides and insecticides the soil is getting polluted. Is this way in real sense a waste or wonder? As it can be reconverted into various useful products without harming the environment. In the present paper various ways to convert this waste into useful products without harming the environment will be discussed.

Agricultural waste or agro-waste which is generated as a result of agricultural crop production and operations is produced every year in bulk. With green, golden and white revolution there has been an increase in the agricultural produce thus it is but natural that increase in produce will definitely result in agrowaste²⁶.

Agrowaste is comprises of crop residues, vegetable and fruit waste from agriculture-

based industries, organic waste produced in poultry, animal husbandry, animal caring and rearing, animal shelters, veterinary and horticultural produce which includes fruit and vegetable packaging and processing industries. In short lots and lots of waste rather biomass is produced²⁶.

This biomass produced in earlier days was burnt and still in some adjacent areas of

Delhi it is being burnt and of late was the cause of worry as it pollutes the air in and around the national capital.

This waste which is produced is approximately 600 million tons and can be put to use in multiple ways. This in turn can help reduce burden on economy, help in generation of clean energy, help in reducing malnutrition, toxic heavy metal pollution along with pesticides, chemical fertilizers (agricultural), wash off pollution can be reduced.

Not only will it help in above mentioned things but also help in generation of employment for both skilled and unskilled people. It is very useful economically as with lot many benefits can be harnessed from the so-called waste.

India being populous country 1.3 billion at present need food and one has to think of scenarios after 4 or 5 years i.e. Forever growing population more and more technology and methods are being researched for increasing food production. In other words, agricultural sector should be strong. Food production has to be more in future and it needs to be increased. The more the production more will be the agricultural waste generation. There are estimates that 600 million tons of agricultural waste instead of being utilized is either lost naturally or is incinerated without use.⁶

This sector not only caters to hunger but also provides employment to people. The industries dependent on it also are a source of employment. The agricultural waste which seems to be a cause of many problems, such as pollution, releasing foul smell on its

decomposition in open can be tackled by tapping the waste and converting it into resource for the production of various other useful products in an ecofriendly manner.

Modes of waste generation :

Wastes generally are generated as a result of various agricultural operations. These include harvesting, milling besides various types of food processing. Agriculture related or dependent industries are quite numerous like fruit and vegetable, meat, poultry and dairy product processing, dressing etc result in generation of waste.

This waste either gets dumped at various places or gets scattered unhygienically and decomposes and rots generating a mileu of health concerns besides being a cause of environmental pollution.

Composition of wastes :

Agricultural waste mostly comprises of lignocellulosic organic wastes mostly. It has been estimated that 80% of total solid wastes generated in any farm comprises of organic wastes¹⁵ It includes wheat straws, wood chips, wheat, barley and rice straws, maize, stem residue, wheat and rice bran etc¹³.

India being a populous country produces 600 million tons per annum, which is a cause of various health problems. There is a solution to this problem. This very waste can be utilized in ecofriendly manner to generate revenue, employment and useful commodities. First and foremost, this waste can be utilized for the production of energy. This biomass is

being utilized by many countries for the production of energy as in Bulgaria.²²

They not only utilize the solid waste but also the animal manure for the production of biogas. Solid wastes like saw dust can be utilized for the removal of dyes as has been reported earlier.^{4,9,14} Similarly coffee waste can be utilized in the production of bricks¹ besides this, it can be utilized as soil stabilizer as reported in an earlier study.²⁰

Wheat bran, coconut shells, rice husk can be utilized in the production of bio-alcohol, in constructing roads,^{12,25,27} it can also be utilized in stabilization of soil.¹⁰ These wastes can also be utilized for the production of various enzymes at lower costs which otherwise because of costly substrates used are quite costly. Agro-waste can also be converted into fuel cakes, charcoal- for power generation in a sustainable manner²². It can be converted into briquettes, biogas production, composted or used as soil conditioner, animal fodder etc. as reported earlier.²⁶

Agro-waste can also be utilized as a cheap source of substrate for the production of mushrooms, a great source of protein which can take care of malnutrition.^{8,18,21,24,28} Agro – waste utilized for mushroom cultivation has been considered most efficient and low cost means for production of high quality protein^{5,17,22}

Agro-wastes are nutrient rich and are taken up by mushrooms and determine the quality of the produce. It becomes imperative that these should be chemical free, otherwise instead of being a super food these can be

harmful for the consumption by the humans and affect their health.^{19,24} This waste can also be utilized as an organic fertilizer and vermin composting⁷.

People world over have become health conscious and more and more people want healthy food, mushroom being one of the super foods are also in great demand world over.^{3,16,28} Simple conversion of agricultural waste into organic manure can help in reducing the use of chemical fertilizers thus leading to reduction in cost of chemical fertilizers and at the same time benefit by being eco-friendly.¹¹ Mushroom cultivation is a revenue generating industry and can generate employment for all, skilled and unskilled alike.¹⁸

Agro-waste which is produced in bulk approximately 600 million tons per annum in India, is lost naturally and part of it is incinerated or burnt⁶. There is a great need of utilization than disposal. This waste can be utilized as safe animal or poultry feed. Besides this, it can also be used in composting, vermin-composting, generation of energy, bio-remediation and removal of dyes etc. Instead of disposing it as landfill, we can utilize it for the production of super foods such as the mushrooms and many other uses as mentioned above. If not heeded or paid attention to, can become toxic, health hazard and lead to environmental pollution and other related problems.

Thus, by utilizing the agricultural waste as mentioned above we can generate food, revenue and employment without causing harm to our environment.

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