

## Utilization of Agricultural Waste

**Hamza Munawar\* and  
Muhammad Yaseen**

Department of Agricultural  
Extension, College of  
Agriculture, University of  
Sargodha, Pakistan



\*Corresponding Author

**Hamza Munawar\***

E-mail: hamzasandhu847@gmail.com

### Article History

Received: 14. 04.2021

Revised: 19. 04.2021

Accepted: 24. 04.2021

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### INTRODUCTION

Agricultural wastes are the surplus of the different agricultural raw products, which are obtained from the different growing, and the processing agricultural products like vegetables, poultry, fruits, meat, crops, and different dairy products. These wastes are not just the wastage of products but also the wastage of our critical resources like land, labor, fertilizers, and energy. But these products can benefit humans if they are used in the right way. Their benefits are more than the amount of revenue spend on their transportation, collection, and processing. These may be present in solid or liquid forms. Agro-waste is the term used for these kinds of products. The number of tons of agricultural waste is increasing day by day but there is no pattern for their right usage. Pakistan produces a high amount of waste with which they can overcome their electricity shortfall problem. There are different techniques and methods which are used by developed countries to generate electricity from these waste products. Pakistan produces very less amount of its total energy generation by renewable sources which are far less than the developed countries.



Pakistan can overcome the deficiencies in its natural gas and power sector by these practices which are far cheaper than the other ones. As our country is an agricultural country and the recent share of agriculture in Pakistan's GDP is 18.9%. Our agricultural economic sector produces a lot of agricultural waste so, we can utilize this waste in generating electricity. The agricultural waste which our country produces can overcome our electricity demand to a great extent. We need to utilize these resources with the right approach and through effective methods which will help the country's economy.

Pakistan has almost every kind of climate which is favorable for every type of crop production. The tropical climate is the best production climate for most of the weeds, insects, and crops. As the number of insects increases the ratio of attack will increase and most of the crop will destroy and cannot be used for any purpose. But these waste materials can solve one of the biggest issues of Pakistan, the electricity issue through biogas energy plants. Most illiterate farmers waste these crops which can help them in terms of revenue. Biogas is one of the emerging renewable resources for electricity production.

Some of the farmers uses solar energy tube wells but most of the farmers in Pakistan use electricity tube wells. By using biomass energy resources developing countries like Pakistan can boost up their economies and ultimately this would help the farmer to reduce his expenses. Farmers can both produce and sell the excessive amount of energy produced by this plant. It is one of the emerging trends in the energy sector which attracts many giants of this sector. Different crop residues and manure are used for cooking and heating in rural areas. There are many biogas plants in our country but these are not enough to overcome this problem. The need of the hour is to focus on this cheap source of energy. We need to educate our farmer that how can he take benefit from this and how can he get revenue by selling this waste. The average expenses on building a bioenergy plant are 52,000-65,000 rupees. The manure of only two cows is enough for a normal household. energy. Also, with this plant excess amount of manure that comes at the second outing of the plant can be used as a fertilizer. Further, it can solve the natural gas issue of Pakistan. The gas produced by the energy biogas plant is far cheaper than this.



Farmers used different crop wastes to feed their animals, like paddy crops byproducts such as rice bran and paddy straw are produced. Farmers usually used paddy straw for making shelter, beds, and for feeding animals. However, they can produce energy from paddy straw and wastes like mustard and cotton sticks. In the same way, wheat straw can be used for making particleboard and different products like hats, briquettes, mats, and different other handicrafts but farmers utilized these for feeding their animals. Sugarcane wastes are bagasse and sugarcane trash. Bagasse can be used as fuel for the production of jaggery. This waste can also be used in the paper, cardboard industry, for the growth of green fodder, and energy generation. Barbojo (sugarcane waste) is also used for energy production. Cotton sticks are one of the best sources for biogas production. However, these can be used in the particleboard, plywood industries, and in power plants which would help the farmer in the form of raising income. By-products of mustard are husk and sticks of mustard. Most of the farmers sell these byproducts to brick industries. It can be used for feeding the animals after ammonia treatment. Briquettes can be made from these sticks. Horticultural crops waste like dead branches, damaged fruits, leaves, and unsold vegetables and fruits are not used in the right way. Farmers used this waste for feeding their animals. But, the methods like drying can preserve these fruits and vegetables for a longer period. Chemicals like lactic acid, citric acid are produced by these waste products. The orange peel which farmers usually did not use in Pakistan, it can serve as an insect repellent, such as aphids and mosquitoes. It helps in increasing the soil acidity and serves as fertilizer too. Similarly, in floriculture, the plants are useless after picking the flowers. Farmers sell these damaged flowers at minimum prices. Some of the farmers used these damaged plants in manuring the field. These flowers can be dried and powdered for the making of dry flowers which is an emerging industry soon. In the same way, the

mushroom waste after the harvesting of mushrooms can be used for composting as well as vermicomposting. It can also be used for gardening, nurseries, and growing vegetables for better growth and to enrich the soil. Forestry waste like dead trees and other plant waste like stalk and leaf of banana, leaf of pineapple and stalk and peel of maize from cob are also used for paper formation. In the same way, some of the farmers did not like to use manure as the organic fertilizer which includes many nutrients like nitrogen which helps in the leaf growth and plant color. Most of the farmers used it for dung cakes formation which they used for cooking and other purposes.



Many hazardous gases emit from these dung cakes which affects humans and their smoke affects the atmosphere also. Farmers can use this waste for the production of biogas. Pyrolysis is another method in which the waste is heated at 400-600°C. This reaction takes place in the absence of oxygen and it provides a char that is used for chemical formation and as an energy source.

Pakistan is among the developing countries of the world which have many crises like energy crisis. It affects the agricultural sector as well as the country's economy. But these problems can be solved by using the right techniques and methods such as biogas energy plants which help the country to overcome the energy as well as natural gas crises. Govt. needs to provide awareness

through extension field staff which is directly in contact with the farmers. Different programs like farmer field staff should be launched to aware the farmers. Govt. should learn from the past programs which were ended in a deficit. There should be a proper and direct mechanism for evaluation. Govt. should need to provide small-scale loans on easy terms and conditions to support small scale farmers which they can use for their betterment. A proper supervision should be needed to confirm if these loans are used in a right way. Secondly, they should provide extension field staff with complete knowledge which they can provide through proper training. The need of the hour is to hire new workers in extension field staff. Obviously, the

new blood will work with more enthusiasm which would help to fight against old mindsets. Govt. should need to build more biogas plants on a commercial scale which would help them to get rid of the energy crisis and expensive energy sources like oil. Secondly the role of extension field staff is much more important for the dissemination of information and implementation of these technologies. They should need to persuade the farmers to use these technologies and the utilization of their waste in a better way and how can they earn more profit from it. With this profit, small-scale farmers can build their farms and spend this revenue on fertilizers, on their animals, and the most important of all to raise their living standards

