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Class:	II Ph. D (Agril. Extn)	Date:	09/04/2022

Doctoral Seminar-I
Management of agriculture waste in protecting environment

SYNOPSIS

Introduction:

The world's population has risen from 3.7 billion in 1970 to 7.9 billion in 2021 and predicted to reach 9 billion by 2050 (Koops and van Leeuwen, 2017). In order to fulfil the intense demands of teaming millions there has been a significant rise in the livestock as well as crop production, which has further contributed towards generation of agriculture wastes (AWs). It is estimated that India generates around 500 Million tons (Mt) of crop residue annually (National Policy for Management of Crop Residues **(NPMCR)** 2019**).** Highest in the state of Uttar Pradesh (60 Mt) followed by Punjab (51 Mt) and Maharashtra (46 Mt) with a grand total of 500 Mt per year out of which 92 Mt is burnt. Cereals, fibers, oilseeds, pulses and sugarcane contributed the highest crop residue with production estimations of 352 Mt, 66 Mt, 29 Mt, 13 Mt and 12 Mt, respectively. Among cereal crops- rice, wheat, maize and millets together contributed 70% of crop residue followed by fiber crops (13%). The AWs and their processing are a global issue since its vast, majority is currently burned or buried in soil, causing pollution of air, water and global warming. Thus it is need of the hour to manage agriculture waste to make good sense both environmentally and economically. Systematic utilization of agricultural waste also helps to improve environmental conditions by reducing pollution caused by disposal of huge agriculture waste.

Objectives:

1. To assess the quantity of agriculture waste generated and its classification
2. To understand the agriculture waste management strategies
3. To discuss the impact of unscientific management of AW on human health and environment
4. To enlist the AW management initiatives of government and non-government in the country

Wastes: Wastes is any substance which is discarded after primary use

Agricultural Wastes: Agricultural wastes are defined as the residues from the growing and processing of raw agricultural products such as fruits, vegetables, meat, poultry, dairy products, and crops.

Types of wastes:

- **According to their effects on human health-**: Hazardous type and Non-Hazardous type
- **According to their properties:** Organic waste or bio-biodegradable and non-biodegradable

Impact on environment: Nitrate pollution Accumulation of nitrates in water drunk by cattle or humans. Combines with the haemoglobin to form methaemoglobin, leads to a serious disease known as BLUE BABY SYNDROME.

Agricultural Waste Management System (AWMS): Planned system in which all necessary components are installed and managed to control and use by-products of agricultural production in a manner that sustains or enhances the quality of air, water, soil, plant, and animal resources

Strategies for waste management: Paddy, wheat, cotton and sugarcane Ethanol, Molasses.

Waste management initiations by

Government	Non-Govt./Private
Bio char	Bio-Lutions Pvt. Ltd.
Soil less Planting Media	Fermentech Lab Pvt. Ltd.
Foliar Spray	
PUSA Decomposer capsules	
CFTRI: Banana waste management	

Research studies

Sindhu (2015) conducted study on agriculture waste utilization at Haryana. Research result pertaining to awareness indicated that awareness about the utilization of biogas plant waste, mushroom waste, wheat waste, mustard and horticultural waste was more than 70 per cent. Awareness about utilization of paddy waste, sugarcane waste, cotton waste, floricultural wastes, poultry waste and livestock waste were between 50 to 60 percent. Thus, overall awareness about utilization of agricultural waste was very high.

Minooei (2017) in his study at Karnataka indicated that the state generates biomass of 66,979 tons yearly in which Belgam, Gulbarga, Tumkur, Raichur, Bijapur and Bellari districts with the maximum production are 8.8, 7.3, 6.2, 5.8, 5.8 and 5.4 per cent respectively. He reported that production of agro-residues biomass by important crops such as rice (30.2 %), Jowar (20.2 %), cotton (13.2 %), corn (11.7 %), peanut (9.5 %), ragi (7.4 %), sugarcane (4.8 %), bajra (4.1 %) and wheat (1 %).

Singh *et al*. (2020) conducted case studies in Ludhiana District of Punjab on three dairy farmers, each pursuing vermicomposting, biogas production and traditional composting. It is reported that the Net returns from the animal waste obtained from one cattle equivalent were highest from vermicomposting (Rs. 11,012) followed by biogas production (Rs. 2,656) and composting (Rs. 225).

Conclusion:

Indian population is increasing year by year with increasing food demand. Increasing food production, resulting significantly in generating agriculture waste residue. Several studies reported that Indian farmers are not utilising agriculture wastes properly which is impacting on environment as well as farmer's income and also Indian economy. There was a huge difference between the awareness and utilization of agricultural waste. This difference existed due to lack of interest among the farmers. Thus, there is need to motivate farmers which can be made possible by organizing trainings, lectures, educative films to farmers or demonstrating waste management techniques on field.

Reference:

Minooei, O. and Mokshapathy, S.,2017, Agricultural Waste Management in order to sustainable agriculture in Karnataka. *International Journal of Environmental & Agriculture Research*. 3(3):2454-1850.

Sindhu, N.,2015, Agricultural Waste Utilization in Diversified Agriculture. *M.Sc. (Agri). Thesis,* Choudhary Charan Singh Haryana Agricultural University, Hisar, Haryana (India).

Singh, A., Tiwari, R. and Dult, T.,2020, Augmentation of farmers' income in India through sustainable waste management techniques, *Journal for a Sustainable Circular Economy., 35(2):1-11.*