

## **A Study on the Management of the Agricultural Waste**

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### **Abstract**

Farming is oldest occupation for both India and the world. One of the main occupations, agriculture supports both secondary and territorial sectors. Farm which promotes growth of industries, for raw materials such as textile cotton, cigarette tobacco, etc., are considered agribusinesses. Agricultural waste is a byproduct of agriculture that may produce material that is beneficial to humans but has a lower economic value than the cost of collection, transportation, and handling for beneficial use. Farm waste projections are scarce, but it is widely assumed that it accounts for a significant percentage of the total waste throughout the developed world. Agricultural sector is often accompanied by the irrational use of intensive agricultural practices and chemical abuse in cultivation, which has a negative impact on rural communities and the climate system. Rural waste generates mainly through cultivation, livestock and aquaculture from a number of sources. The '3R' Waste Management Strategy currently utilizes these wastes for a number of applications. Agricultural Waste Management System (AWMS) has been discussed in this paper. Agricultural waste has a toxicity potential in many direct and indirect channels for plants, animals and human beings. The environmental impacts and management of this toxic agricultural waste have also been discussed which will be helpful for the researchers and the students of agriculture to know about the management of the waste in detail.

**Keywords:** Agricultural, Animal, Cultivation, Environment, Management, Material, System, Waste.

### **Introduction**

The meaning of agrarian waste is that of the buildups of crude horticultural items like natural product, vegetables, meat, poultry, milk items and harvests developed are handled. They are the non-result of rural creation and preparing that may contain materials that can be useful to man yet whose financial qualities are not exactly the expense of assortment, transport and handling. It very well may be as fluids, slurries or solids and the arrangement will rely upon the framework and kind of homestead exercises. Food squander (just 20% of maize is cinnamon and 80% of it is squander), crop squander (corn stalks, sugar stick bagasse, products of the soil drops, pruned food) just as risky and poisonous horticultural waste are remembered for farming waste (pesticides, bug sprays and herbicides, and so on)[1]. Farming waste assessments are uncommon, however are for the most part considered to contribute an impressive portion of the whole waste material in the created world. Normally, expanding farming creation has prompted an increment in domesticated animals squander, crop deposits and agro modern side-effects. Horticultural waste is required to increment essentially worldwide if non-industrial nations keep on fortifying farming frameworks. Yearly farming waste is assessed at around 998 million tons [1]. Natural waste can address up to 80 percent [2] of the general strong waste created by any homestead of which, on a wet weight premise, compost creation can reach up to 5.27 kg each day/1000 kg live weight [3].

As recently referenced, agriculture advancement is typically joined by squander from the silly utilization of escalated cultivating techniques and the maltreatment of synthetic items utilized in development that fundamentally influences country conditions and the worldwide climate. The waste created relies upon the sort of rural action.

#### *1.1. Wastes from Cultivation Activities*

While hot weather is favorable for crops, it also encourages the production and growth of insects and weeds. This scenario creates a great deal of supply for pesticides in trying to harm insects and safeguard them from the spread of infectious disease; it often gives rise to farm owners abuse of pesticides. After pesticides are used, most bottles and packages containing these pesticides are thrown into fields or ponds. The Plant Protection Department (PPD) provided an estimated 1.8% of the chemicals in their packaging [4]. These side-effects could prompt flighty ecological results like food poisonousness, dangerous food cleanliness and sullied farming area in view of their conceivably practical and harmful substances. Moreover, existing buildup bundle and pesticide bunches of unique substance with stale or unused pesticides have genuine ramifications for the climate since they might be mistakenly put away or covered that can spill in or enter the climate as a natural by-product and subsequently influencing the climate. For instance, composts assume a significant part in the protection of plant profitability and quality in horticultural creation. Inorganic manure is ease and exceptionally beneficial. Numerous ranchers, nonetheless, utilize a higher measure of manures than plants for their yields [5]. The grave result of such an unreasonable use of fertilizer is the mistreatment of the yearly farm production. The absorption rate of those fertilizer compounds (nitrogen, phosphorus, and potassium) varies based on the types of the land, plant type and fertilizer method [6].

Included in the excess of fertilizer is one part retained in soil, part is retained by means of the surface rushes, lakes and/or rivers, resulting in surface water pollution, part of the soil entering the soil water which is either evaporating or de-nitrating, causing air contamination.

### *1.2. Wastes from Livestock Production*

Cat waste includes waste products, such as butcher shop manure and organic matter, waste water, cage waste, bathing, hygienic waste, toxic gases, such as  $H_2S$  and  $CH_4$  and odors. The pollution caused by animal agriculture is really a significant issue, because most of it is built on residential grounds. Air pollution includes cages from digestive system of animal feces, organic manure rotting, animal urine and/or foods that are obsolete. The intensity of the smell is determined by animal density, airflow, humidity and temperature. Digestion depends on the proportion of  $NH_3$ ,  $H_2S$  and  $CH_4$ , and the organic substances, dietary components, microorganisms, and animals' health condition. This untreated and unusable waste origin can generate greenhouse gas emissions and potentially impact soil fertility and water pollution. The rest is made of biotechnology, inorganic materials, many micro-organisms and parasitic organism species. 75% to 95% of the volume of water is generated from waste products [5]. Such microbes as well as materials can cause human diseases and many harmful effects on the environment.

### *1.3. Waste from Aquaculture*

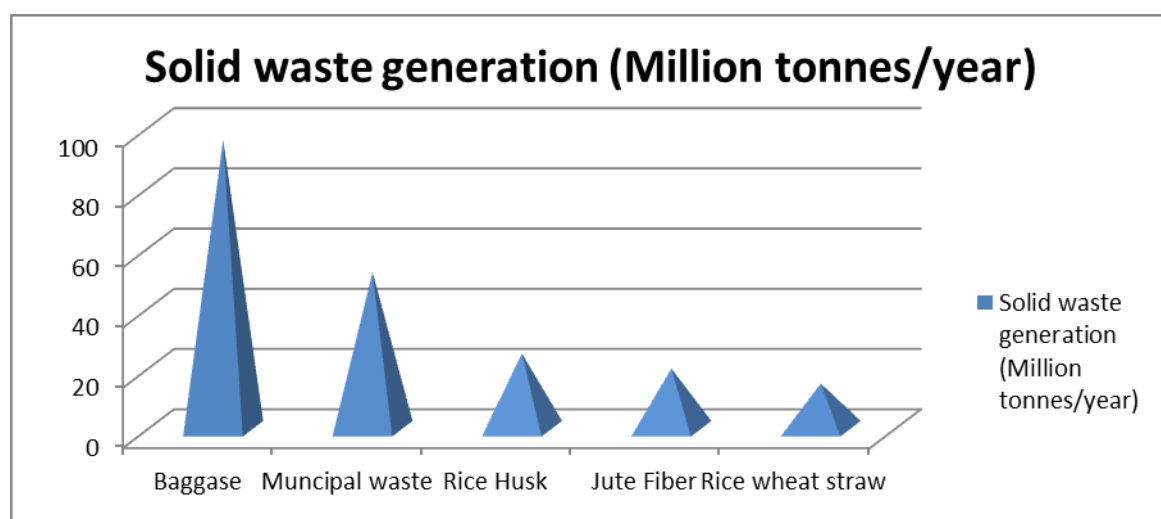
Increased use of feed for better output has resulted from aquaculture growth. In determining the quantity of waste produced, the amount of feed used in a system is the main factor. This section of the report discusses waste from the use of feed for aquaculture, and provides a summary of information [7]. Metabolic waste that could be broken down or suspended is one of the principle squanders created in hydroponics. Around 30% of the feed utilized is strong waste in an appropriately overseen ranch. Taking care of rates are dependent upon the temperature of the climate. Temperature increment prompts expanded feed, which prompts expanded waste age. The example of water stream in squander creation units is significant on the grounds that an appropriate stream will limit the fracture of the defecation of fish, and will empower the settling of solids to be immediately settled and thought. The way that a high level of un-fragmented excrement can rapidly be caught and the disintegrated natural waste decreases fundamentally can be significant [8].

### *1.4. Waste Utilization Routes*

Innovation for the use of agricultural waste shall either use byproducts rapidly or store them under conditions that are not spoilable or make the particulates inappropriate for the intended final product. The waste could be used for a number of purposes.

The management of waste is now both a burning problem and a global one before the world. We face issues such as nuclear waste, e-waste and the conversion of agricultural waste into resource. We have the problem of waste disposal. It would be a resource in the agricultural sector if we managed the management of agricultural wastes properly. There is so much to do with agricultural waste, including farm waste, waste seeds and seedlings, including the cow waste, which is still regarded as agricultural waste, because it is the integral part of our farming systems. But if we manage agriculture in a wise manner, it will certainly support our economic system.

Global warming represents an alarming problem and reuse of resources is the best way to control it. After 1947, horticulture, agro-processing, feed, farm waste and aquaculture contained waste from agricultural products [9], [10]. Every year some 140 billion tons of agriculture's biomass is produced in the world and some 500 tons of farm waste is generated every year in India [10]–[13]. However, agro waste, such as biocompostage, mushroom production, power generation, animal feed and much more need to be reduced properly and disproportionately and reused [14]. In India, basic waste processes like septic garbage drainage, open land and combustion are still used. After harvesting time, agri-business remains of leaves, stalks, etc. These wastes are large and have a low protein and fat content. The following are examples: wheat, paddy, sugarcane, mustard, bagasse, vegetable residue, tea, yute fibre, food, wood-burning waste and so forth [15]–[17]. Around 20% of agribusinesses are damaged by poor post-harvesting facilities and 10% are consumed by rodents [18]. The current state of solid waste management in India is illustrated by Figure 1.



**Figure 1: Shows the different types of solid waste generated in a year in a graphical form.**

A less environmental impact as well as the greater accuracy must be the basis for the choice of garbage processes. The reduction of agri-residues and recycling of organic matter are also a main objectives of management [19]. The manure/compost garbage or disposal at waste disposal, with less impact on the environment, could be done using aerobic or anaerobic processes [20]. Numerous cycles, including assortment, transportation, preparing, reusing or removal and waste checking, are accessible under squander the executives. For the reusing and preparing of foods grown from the ground, squander microbial innovation is utilized. If there should be an occurrence of banana, a significant yield in Maharashtra is developed in around 46,900 hectares territory and produces a huge amount of waste after the gather. The readiness of natural manures utilizing a treating the soil strategy is another waste handling innovation. This innovation adds to improving soil fruitfulness and development. Kalpataru Power Transmission Ltd. in Rajasthan was utilizing mortar agrarian waste to produce power. The arrangement produces almost 8 MW of energy [21]. For bananas, Maharashtra is a significant yield in roughly 46,900 hectares and produces a lot of waste after the reap. The arrangement of

natural manures utilizing a treating the soil technique is another waste handling innovation. This innovation adds to improved soil richness and yield creation [22]. Kalpataru Power Transmission Ltd. in Rajasthan has utilized agrarian waste from mustard crops for creating energy. The arrangement creates almost 8 MW [21].

#### *1.5. Importance of the agricultural waste*

Farm waste is not like nuclear waste, because it is linked to soil fertility. To take the appropriate measures, agricultural waste can be converted into a valuable resource. After reaping, it turns some food grains, seeds and seedlings into organic matter which is mixed with the soil. When the organic matter and earthworm are mixed together, it results in soil fertility. It can be referred to as "humus" rich in fertility. Fertility in the soil is also increased by animal waste called "cow dung," that can be mixed with earthworm. The cake is still used in villages as a fuel. The dung of cows that is the best organic manure for plants, which includes nitrogen, prosperous and potassium. Cow urine is used both in the phenyl preparation and in herbal preparation.

Bio-gas produced by cow dung is a fuel of alternative wood for avoiding cutting trees. The cow dung cakes are used to spread positive vibration in yagana performance. The cakes of cow dung are also used to prepare the "vibhuthi" used by some religious communities. Our indigenous companies export organic manure produced by cow dung to other countries with international demand. The decomposed poultry waste, which also increases soil fertility. If fruit is produced at the highest level, then it can be used for the preparation of health drinks, jams, jams, juices, etc.

#### *1.6. Effects of the agricultural wastage as a resource*

To prevent deforestation, increase exports, control pollution and increase soil conservation by turning agriculture's waste into a resource. When we use the agricultural waste, which includes the dung of cows, we are also the best organic fertilizer. Instead of chemical fertilizers such as urea, the organic fertilizer included in farm waste can be used to prevent depending on the chemical fertilizer and the import of chemical fertilizer from foreign nations from being reduced. The constitution itself prohibits the slaughter of cows in India. And we can make a good exchange with this organic manure.

#### *1.7. Agricultural Waste Management System (AWMS)*

Agricultural waste management (AWM) has recently become a matter for policymakers in ecological agriculture and sustainable development [5]. The common approach to waste management in agriculture was environmental discharge with or without treatment. Wastes should be considered rather than undesirable and unwanted as potential resources in order not to contaminate air, water and land resources and prevent dangerous material being transmitted. This will include better utilization of innovation and motivators, change in way of thinking and conduct and improved ways to deal with the administration of farming waste. Natural waste, specifically creature fertilizer, which is inappropriately overseen or left untreated may prompt critical air, soil as well as water quality corruption. Stale waste is a mode for the rearing of flies and transmission of infections. Uncontrolled natural waste deterioration produces both musty gas, and volatilization of alkali, which causes acidic downpour [23]. With animal production intensifying in a small area, there are growing concerns:

- Higher nitrogen and phosphorus water quality;
- manure pathogens and antimicrobial agents;
- Ammonia, methane and nitrous oxide emission foul odors and air quality;
- Potassium, phosphate loads quality soil.
- Water quality.

AWMS is a "Schematic system for all the required components to be set up and controlled and used in a way that supports or improves air, water, soil, plants, and animal resources") [24]. An arrangement of this sort is created over time by utilizing the whole framework approach, i.e., to provide food for every one of the buildups

identified with horticultural creation. The fundamental attribute of the treatment of the material is the Total Solids (TS) convergence of agrarian waste. The accompanying components, for instance, influence the degree of TS in discharged compost: environment, creature type, creature water admission, and feed type. For instance, discharged manure. The consistency of the waste can be anticipated or decided in many frameworks. The TS convergence of the waste can be expanded, by adding water and balancing out it from extra water. The TS fixation is significant on the grounds that it influences the absolute waste volume to be dealt with. The robotization and treatment of fluid waste frameworks are frequently simpler than for strong waste; however the underlying expense of fluid handle gadgets might be higher than that of strong waste frameworks [24]. AWMS is composed of six basic functions as shown in Figure 2 [24]. These include production, collection, stockpiling, processing, transfer and use. The quantity and nature of agricultural waste produced is a function of production. The waste must be processed if sufficient amounts are produced to become a resource concern. During the whole production analysis the type, coherence, volume, time and location of the waste manufactured is also included. The collection shall contain the initial trash pickup and gathering from its source or deposition.

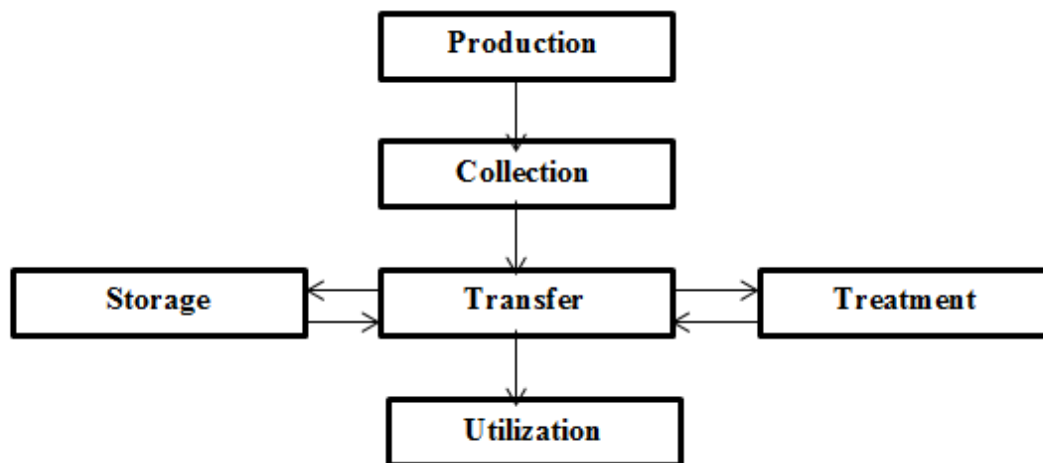
The AWMS plan should identify the method of collection, location of collection points, the collection scheduling, work requirements, the equipment or facilities necessary, the cost of managing and installing the components as well as the impact of collections on waste consistency. The storage function is related to containing or holding waste temporarily. The waste administration framework's storage space controls the booking and timing of the framework capacities, like the treatment, application or utilization of the waste that can be influenced by climate conditions or meddled with different tasks. The waste administration framework ought to decide the capacity time frame, stockpiling volume, type, assessed size, and position and plant costs for the capacity plant, stockpiling measure the executives' costs and the effect of the capacity on the waste rationality.

Treatment would be any feature intended to reduce pollution or waste toxicity, including physical and chemical and biological treatment, and to increase its potential side use. This directly indicates activities such as analysis before discharge of waste features; identification of desired wastes following treatment features; selection of type of treatment, estimated size, site and construction costs of a treatment facility; and process budgeting process. The transmission of the waste is defined as a solid, fluid or sludge from the compilation to the utilization stage, based on the amount solid concentration. Garbage use has been useful and covers the recycling of reusable wastes and the incorporation of non-reusable garbage particles into the atmosphere.

#### *1.8. The '3R' Approach to AWM*

Reduce waste quantities and negative effects by reducing the amount of waste generated, reuse waste products with simple treatments and recycling the waste using it as a resource for the production of the same or modified products. It is commonly known as 3R as shown in figure 3. Some waste products may be used as resources for the manufacture and recycling of different goods or the same product. It offsets the harvest of new similar or same products when waste is repeatedly re-used. This reduces the use of fresh resources and the production of waste. To sum up, 3Rs collectively and individually end up saving fresh resources, contribute positively to resources which already are used and reduce waste and its harmful impacts very importantly. The waste reduction, resource and product recycling principle (3R) is built to reduce waste efficiency by:

- The choice of using items to reduce waste generated in a meticulous manner.
- Repeated use of articles or portions of articles still useful in nature.



**Figure 2: Shows the Six functions of the Agriculture Waste Management and their relation With Each Other**



**Figure 3: Shows the 3Rs Hierarchy with the least favoured option to the most favoured option.**

Agriculture is the production of foodstuffs and related goods. Maybe it is man's oldest contribution to the survival and welfare of mankind. Man has created agribusiness from an unassuming start of assortment of food into a gigantic, innovation driven industry. The extension and utilization of information acquired from fields like science, innovation and even math or law to farming is developing with the developing worldwide human populace. Industry and horticulture have in ongoing many years prompted both created and agricultural nations being kicked back by the climate and the climate. Researchers and chairmen depend on administration sciences to counter these rebellions. In view of a supported interest in agro-science, enormous writing is accessible on various parts of agribusiness' current circumstance. The Food and Farming Organization of the United Nations regularly creates best in class reports to help organizers and chiefs comprehend and manage horticultural issues. Present day cultivating techniques have without a doubt assumed a significant part in expanding food creation around the world.

Simultaneously agribusiness is likewise a significant wellspring of ecological contamination and waste creation, similarly as different features being developed. Both interconnected agrarian results are the after-effect of a large number of exercises and materials utilized for expanding proficiency and worldwide agribusiness creation.

Commonly unsalvageable changes in the climate have been caused, for instance: transformation of huge stretches of waste land into arable land, the turn of events, and thusly, of groundwater assets, abuse of inorganic manures, informal utilization of pesticides, and the reception of conflicting agro techniques.

## **2. DISCUSSION**

Farm waste is dumped and not properly re-used, leading to a variety of environmental problems. Most prominent use of agriculture and biofuel will help many people develop their supplies of farming and biofuel. There is an enormous scope for industries to recycle and produce waste products for the recycling of agro-waste. To make another time on legitimate waste administration with the assistance of certain research center cycles and science and innovation. Numerous ranchers don't have the foggiest idea how to utilize horticultural waste. Some of them think about the reuse and the board of the waste; they utilize the waste appropriately. A few procedures to decrease squander, to create cash and to create occupations are created to control squander. For soil richness, and furthermore for bioenergy and mechanical biotechnology, timberland and rural waste are significant. These waste materials are utilized for development materials, warm creation, designing and numerous different applications. Some new advances are being utilized for valuable purposes to reuse agrarian and ranger service squander. Agribusiness ranchers and public everywhere should know about different practices for squander the executives to build up a brilliant and powerful administration of farming waste. Private companies, with the support of NGOs, are launching careful campaigns to raise awareness of the use of agro-waste as well as to promote recycling. There are few examples:

- Keep people informed, including pollutes river, air and land, about the environment around them.
- Careful attention to new environmental policy.
- Stop burning waste in particular.
- Informal activities and connections on agro-waste management.
- Product recycling, commercialization and distribution information.
- Separate waste collection and transport system, as well as waste recycling.
- Tell plastic bags 'no'.
- Motivating the population to set up a biological waste vermiculture bin.

The reduction of agro-waste can create a healthy and fresh environment. Saucer and bright India advancement can be supported through influential agro-waste strategies, scheduled strategic planning and strict planning.

## **3. CONCLUSION**

Rural waste is the buildup of crude farming creation and fabricating and can contain material that can profit people. Non-item creation and preparing yields. The buildups are delivered from a scope of cultivating exercises, including yields, cultivating, and hydroponics. On the off chance that appropriately oversaw, waste can be changed into helpful materials for human and farming use by applying the information on agrarian waste administration frameworks like the "3Rs." It is significant not to infer that legitimate recuperation, stockpiling, handling, moves and utilization of waste is an indication of wellbeing. Legitimate utilization of waste will assist with developing our cultivating area and give numerous feasible biofuel assets. The conversion of agricultural waste into a resource is the best concept before the world today, which is used to increase foreign currency, increase soil fertility and to avoid deforestation.

It is sufficient to say that to manage squander issues; we need a more tough coordinated and vital waste avoidance structure. Existing frameworks are critically required as opposed to attempting to aimlessly supplant them with created country models. There is a critical requirement for an all-around characterized vital waste administration plan and for a solid execution in India to forestall any incident and to make each city a sound city

monetarily and naturally. The qualities and shortcomings of the local area and of the metropolitan organization, which empower a productive waste administration framework to create with the association of various partners in India, should be deliberately dissected to accomplish monetary manageability, financial and natural focuses in squander the executives. Mindfulness raising efforts and instructive measures can change public disregard. Local area affectability is additionally crucial for the objectives set above, and we need to act and act rapidly, on the grounds that each city in India is now a hotbed of numerous infectious illnesses caused generally by wasteful waste administration.

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