# WASTE TO WEALTH: CONVERTING BURDEN INTO BLESSING

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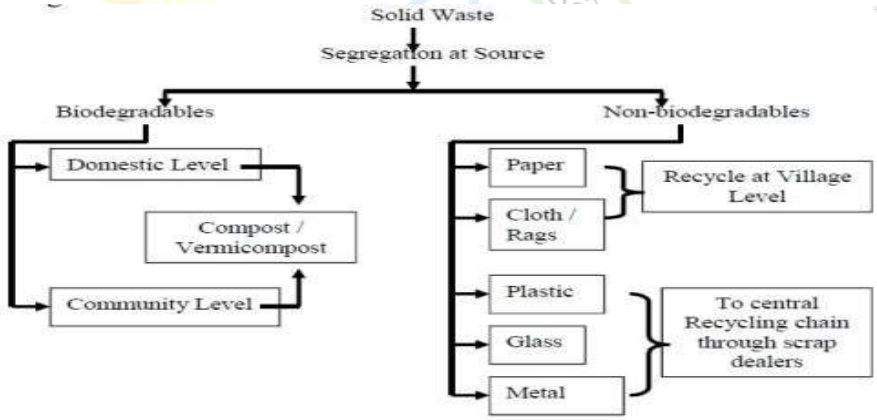
"There are only a few things in life that are certain: death, change, and waste." These events cannot be stopped from occurring in our life. But we may arm ourselves with better management. "Anything that does not create value" is how most organisations describe waste (BSR, 2010). Anything that is unpleasant or unusable in the eyes of the average person is waste or garbage. However, according to science, there is no such thing as waste. If converted or processed scientifically, almost every component of solid waste has some promise. Therefore, solid waste can be described as "Organic or inorganic waste materials produced out of domestic or commercial activities, that have lost their value in the eyes of the first owner but which may be of great value to someone else." Garbage can come in a variety of forms, including domestic garbage, industrial waste, waste from oil refineries, e-waste, construction waste, agricultural waste, waste from food processing, biomedical waste, nuclear waste, and waste from slaughterhouses, among others. Waste can be categorised as follows:

• Solid waste, such as food scraps, garbage from the kitchen, and other materials.

• E-waste is the term for discarded electronic equipment such computers, TVs, music players, etc. • Liquid waste-water from tanneries, distilleries, and thermal power plants, among other sectors.• Plastic trash, such as bottles, buckets, bags, etc. • Metal scraps, such as unwanted metal sheet. • Nuclear waste, which consists of leftover nuclear power plant materials Additionally, we can divide all of these waste kinds into dry waste (non-Biodegradable) and moist trash (Biodegradable).




**Source: waste management initiatives in India for human wellbeing, 2015.**

An estimate from 2016 states that India generates 277 million tonnes of municipal solid trash annually. That amounts to more than 80% of the 334 million tonnes of rubbish produced in South Asia and almost 13% of the waste produced worldwide each year.

Producing enough food to sustain the expanding population in emerging countries is one of the largest issues because it is a basic human necessity. As a result, there should be more environmental technologies used in the production of food. One such intervention is the management of agro-waste, especially when it comes to wastes from agriculture and food production. Food

and green waste account for more than 50% of waste in low- and middle-income countries. Food waste makes for about 57% of all municipal solid trash in South Asia especially. Although the amount of organic waste in high-income countries is comparable in absolute terms due to higher levels of packaging waste and other non-organic waste, about 32% of the food produced is wasted. CO2 emissions rise when food waste is disposed of improperly.

Agricultural wastes are the leftovers from producing and processing agricultural products, including grains, fruits, vegetables, meat, poultry, dairy, and other raw agricultural items. They are the byproducts of the production and processing of agricultural products that might contain components that are useful to people but whose economic worth is less than the expense of gathering, transporting, and processing them for such purposes. Finding a creative solution for effective waste management is challenging since the breakdown of garbage necessitates specialised processes that take time, effort, and money. The issue must be recognised at the very beginning of trash generation. It is critical to consider "waste" as a priceless "resource" that can be utilised to create a range of beneficial goods. This process of turning garbage into a product that can be used for everyday purposes might be seen as a way to create riches. Thus, the expression **"Waste to Wealth."** The idea of "waste-to-wealth" has been utilised to address the environmental issue by challenging the conventional perception of garbage as a finished good that has to be disposed of. The globe has seen the need to increase environmental awareness and turn it into potential value as a major issue. Innovative waste conversion techniques can generate a tremendous amount of micro-entrepreneurship luck given the volume of waste produced. The potential for waste to wealth businesses in India is very significant. Increasing this company's chances can offer a variety of benefits.

Natural consequences of increased agricultural production include more livestock waste, crop wastes, and agro-industrial byproducts. If developing countries continue to expand their agricultural systems, there will likely be a considerable rise in agricultural wastes globally. India alone produces over 350 MT of the approximately 998 million tonnes (MT) of agricultural waste that is thought to be produced annually worldwide. In any farm, organic wastes can make up up to 80% of the total solid wastes produced, with manure production reaching up to 5.27 kg per day per 1000 kg of live weight on a wet weight basis. Agricultural waste can be transformed into a variety of products that benefit the environment and generate profit.

## SOME OF THE AGRICULTURAL WASTE WHICH CAN BE CONVERTED INTO WEALTH:

### 1. Division of Agricultural Engineering developed BIOCHAR from Agricultural Waste Material.

The incomplete burning of biological materials in the absence of oxygen or with little oxygen results in the production of biochar, a substance rich in carbon. Biochar can also be made from weed biomass and agricultural waste. According to the researcher, biochar can drastically lower the amount of greenhouse gases like CO2 and CH4 in the atmosphere by storing carbon in the soil for hundreds to thousands of years. Biochar was produced using a continuous biochar production machine or a modified portable metallic kiln using biomass (Ageratum conyzoides, Lantana camera, Gynurasp., Setaria sp., Avenafatua, Maize stalk, and Pine needle) as the raw material.

**Features:**

- Biochar is created using the pyrolysis method from agricultural waste (maize stalk, pine needle, and weed).
- Biochar can be produced from agricultural biomass in two hours.
- Improve crop yield and soil fertility.
- Better utilisation of fertiliser.

- Enhance soil tilth, water retention, and aeration. Decrease nutrient runoff and increase cation exchange capacity.
- Biochar application within two months raised soil pH by 0.26 to 0.30 units.

**2. Making Handmade Paper from Waste Jute**

**Developer :S N Chattopadhyay, ICAR-NINFET, Kolkata**

The creation of a technique for producing handmade paper from jute fibre, particularly jute residue, would create a new market where a sizable amount of discarded jute waste may be used to produce handmade paper with a high level of commercial value. Jute wastes, which would usually be burned by farmers or thrown away and cause disposal issues, can now be used in novel ways.

**Features:**

- Handmade paper produced from jute fibre manufactured from discarded jute waste.
- The majority of the qualities are similar to those of regular handmade paper, but it has a variety of uses, including writing grade paper, paper boards, file covers, greeting cards, shopping bags, and posters.
- Products created with handmade paper use less resources and produce less pollution.
- Making handmade paper consumes a lot less energy overall than making virgin paper.

**3. Sugar Industry Residue Used as Soil Less Planting Media**

**Developed by F. Pushparaj Anjelo and Shinoj Subramannian, KVK, Ernakulam**

The press mud, a byproduct of the sugar industry that is widely accessible at a rate of 2% of the crushed cane, has physical characteristics similar to soil and offers strong root anchoring. Once composted, the press mud gives plants vital nutrients. Thus, a soil-free planting medium is created utilising press mud that has been composted and powdered. This soil-free planting medium is made up of 50% composted press mud, 25% coir pith, and 25% dry cow dung powder. Dolomite is used to balance the mixture's acidity, while Neem cake and biocontrol chemicals are added for additional enrichment. The ICAR-Krishi Vigyan Kendra (Ernakulam) periodically produces the soil-free planting medium, which is then packaged, labelled, and sold in 10 kg bags at the ICAR-CMFRI sales counter.

**Features**

- The press mud, a byproduct of the sugar industry that is widely accessible and accounts for 2% of the crushed cane,
- Better root anchoring and less plant lodging; better moisture retention; less frequent irrigation requirements.
- It has a higher nutrient value, doesn't require a baseline manure dose, and can be planted in more than three times.
- Commercial press mud production for planting media is a viable business for young people and provides urban farmers with a planting solution that is nutrient-rich.

**4. Foliar Spray from Fish Waste**

**Developed by ICAR-CIFT, Kochi's A.A. Zynudheen and Binsi Pillai**

Foliar spray is a liquid substance made from fish excrement that includes peptides and amino acids. The product is made by using an acid or enzyme to hydrolyze the protein in fish faeces. Bacterial fermentation is an alternative technique.

**Features**:

- include being stable at room temperature,
- being able to be used directly on a variety of plants after dilution, and having the ability to be fortified with missing ingredients.
- There is a large demand for the product and it provides meaningful

work with a high return on margin. It also immediately increases the yield of the plants and has pest-repelling capabilities.

**5. Eco-friendly and sustainable wastewater treatment for safe reuse in agriculture**

**Developer: Ravinder Kaur, ICAR-IARI, New Delhi, Water Technology Centre**

It is a brand-new, eco-friendly, and financially rewarding sewage treatment technique that relies on interactions between selected hyper-accumulative emergent wetland plants and local microorganisms. The Swachhta Action Programme (SAP), the government of India's flagship initiative, is used to implement this technology. The National Skills Foundation of India and the United Nations have both chosen it as a good practise example for the "Safe Use of Wastewater in Agriculture" initiative and as an innovation in Indian agriculture, respectively. In 2017, the invention won the coveted civilian SKOCH (Platinum) Award in the category of transformational innovation.

**Feature :**

- The device takes care of multi-pollutant and pathogen loads, together with salt remediation, and requires no energy, chemicals, or expert labour.
- The method is at least 1500 times more sustainable and generates at least 33 times less environmental stress than traditional wastewater treatment technologies, which require capital expenditures that are between 80 and 85% lower.
- This technology has the potential to increase the value of reusing land in agriculture and aquaculture that is free of metals and pathogens.

**6. Decentralised Electricity Generation System Based on Biomass**

**Biomass Developer: AK Dubey, Sandip Gangil, CR Mehta and KC Pandey, ICAR-CIAE, Bhopal**

Before feeding to downdraft gasifiers, the biomaterial is pulverised and briquetted. The gasifier produces the producer gas, which is then transported to the gas generator for the purpose of producing electricity.

Features: Farmers who produce crop residues benefit economically; traders and labourers have opportunities as the market for agricultural residues develops. From 1.5 kilogramme of biomass, 1 unit of electricity may be produced, and the price of power is roughly 7-8 Rs per kWh.

## CONCLUSION

A valuable resource for creating money is agro-waste. Using agro-waste to create money helps to improve agricultural production, increase fiscal growth, decrease environmental pollution, and promote food security. The moment is here to spread knowledge about the 5 R principle. Additionally, there is a need to establish centre of excellence for waste management. It is advisable to produce less waste during the early stages of agro-product development in order to lower the carbon footprint. To create additional profit from agro-waste, secondary cultivation must also be prioritised in addition to primary agriculture cultivation. Small-scale companies should be established in rural and distant locations in order to generate greater wealth from agro-waste. The government should launch additional initiatives and give farmers subsidies to encourage them to embrace the "agro-waste to wealth" approach.

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