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POLICY ARTICLE

Waste management: A step towards sustainable development

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Today waste disposal is a big challenge in front of us. Especially for India, having second highest population of the world, this problem of waste disposal become more challenging. The seriousness of this fact can be imagining by the example of Ghazipur landfill in New Delhi, India's mountain Everest of garbage. It is assumed to grow taller than Taj Mahal by 2020. As we know India is a developing country, right now we don't have enough cost effective technology to tackle waste disposal problem. But nature gives us gift of decomposers; they turn garbage into gold without investing a penny. Thus we can use this old and natural technique for the management of garbage. 'Micro organisms such as fungi, bacteria etc, that mainly depend on dead organic matter of plants and animals. These decomposers convert dead matter into fertile one and thus garbage which generally include organic matter are very useful resource for them as this garbage offers food to them. This bio conversion of organic matter into a valuable resource not only economical but also eco-friendly. It protects our ecosystem and creates balance between nature and human.

But for proper growth of good bacteria we need to keep in mind some management and like temperature, moisture, ph and other nutrient. Good supply of oxygen is essential for their food consumption and for their speedy growth. If a bacteria not get enough oxygen then they adopt oxygen less or anaerobic environment and release only five percent of the energy of food. They also produce methane, greenhouse gas and other harmful compounds for environment.

Although these anaerobic conditions may be useful for biogas plant to produce fuel in the form of methane and oxidized slurry can be used to grow aerobic bacteria. However these anaerobic reactions lead losses of waste resource. So for aerobic reaction, it may be recommended the waste should be spread into thin layer on soil. Bioreactors play a crucial role in maintaining good environment conditions for speedy growth of bacteria. All animals are bioreactors; they regulate temperature, moisture and pH levels for their body.

An earthworm is very suitable for this job because it provides ideal breeding climate for bacterial growth. It converts garbage into nutritious food for bacteria. As man cultivates wheat for his own consumption the earthworms cultivate bacteria. Ecology itself is very mysterious and strange, though predator and prey harmful for each other but beneficial for the community at large. This is the beauty of nature. Earthworms only feed unwanted and lazy bacteria while sparing the useful ones. Culling is the term used for this process and is also called nature's method of family planning. If culling do not happen, bacteria will multiply in bad manner. So for the improved variety of bacteria culling is very important.

Vermiculture is the cultivation of earthworms, in order to use them to convert organic waste into fertile resource. In short a combination of soil processing and waste processing is called vermiculture. Earthworms are good managers for growth of aerobic bacteria for waste management. Thus we should give them proper living conditions for their survival.

The working nature of soil processing takes place in many types. Simple waste like sugar directly consumed by bacteria but complex waste such as cellulose is first broken by earthworm into simpler ones than consume by bacteria. So it is clear that earthworm have more capacity to degrade waste per unit area than would be normally possible.

Lignin, complex molecule form humus by the help of soil bacteria and earthworm. Humus is very essential for soil fertility as it holds nutrient and water. It also gives a fertile structure to the soil as a result the productivity of plant also improves. Nature takes two hundred years to build up ten mili meter layer of humus rich soil while an earthworm takes only one year to make this.

One of the best by- product produced by earthworm during waste decomposition is water and this water helps in reducing irrigation requirement for plant thus saves lots of water and human efforts.

Besides humus and water other element which needed by plants is supply of nutrient. Plant's requirement of nutrients include nitrogen, potassium, phosphorus etc in a balanced ratio. These nutrients are abandoned in nature but the only problem with these nutrients are found in bound form. At this point once again the help of soil manger comes forward, earthworms nurture such type of bacteria which acts as nitrogen fixers, phosphorus solubilisers, vitamin, antibiotic and hormones producers. But the use of excessive urea and manures inhibits the work of bacteria and may cause nutrient imbalances.

Earthworms are the most experienced farmers. Along with waste processing and soil enrichment, they also help in burrowing action needed for soil prosperity as it increase the groundwater table recharge. Air can also penetrate through this and acts as an excellent insulator against temperature. They also break the soil into small particles so that the surface area for nutrient and moisture can improve.

Thus we can see that earthworm has incredible potential to turn waste into money. Earthworm plays multiple role like it act as a farmer, an engineer, a microbiologist in a very efficient manner. Not only this, all above of this it always use it's eco friendly method to protect our ecosystem.

By the use of vermiculture application we can turn different waste such as home waste, sewage waste, agriculture waste into a good resource for our plants in a very economical as well as eco friendly way. If we use this bio technology in whole country than this not only increases plants productivity but also provide employment, reduce the use of chemical fertilizer. Improve fertility of waste land, give good food to citizen and make whole country green and prosperous in a very few time.