

Natural & Traditional Way of Waste Management

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Abstract

“Here, I aimed to elaborate that to survive we human need food, source of carbohydrate, protein, fat, minerals & vitamins. I must say in our modern life we little care of nature so is our arguments. I remember in my childhood, the mother uses to cook tasty subjee of banana peels because it possesses an enormous amount of Dopamine essential for the brain . Today banana peel became waste & Dopamine in the form of milk additives is being purchased form stores. Roti leftover can be a fine source of tasty breakfast. Actually waste comes from thought & way you live. Even more, Food leftover by human beings are for Domestic Animals. Its the part of our culture, Tradition, as it creates life long relations between humans & animals specially Cattle and Dog. We daily keep vegetable waste in a separate utensil for cattle & dogs. We have regular visitors, they are punctual in their timing. So, waste for us is food for them. They are our natural scavengers, convert our waste to use full cow dunk in return, they do their job free of cost. Dog provides free & vigilance. As per Ayurveda, our aim should be to take a little less food than required, keep 25% space in the stomach for water. Control our greed for food.

In restaurants, Hotels, banquets enormous quantities of food is wasted. Nature gave us a natural waste management system. Need is we must obey nature’s Rule. So, Its Gandhian thought “waste management in a natural way” Overall, I conclude that there should be a minimum gap between need & waste. Secondly, harmless waste eatables when fed to Animals helps to eradicate waste, 40 percent of the food produced in India bound to become. Were as, 44% Cattle feed shortage India is facing & of course millions of humans are foodless.

Keywords: Traditional Way of Waste Management

Introduction

Vegetable Waste and Management

Since ancient times, humans and animals have used the earth’s resources to support life and dispose of waste. In primitive society, disposal of human and other wastes did not pose significant problems because the population was too small and the amount of land available to collect waste was too small and the amount of land available to collect waste was large. India has a very ancient civilization, which goes on for a century. The earliest recorded Indian concept is found in the rig ved, which begins with a vivid description of the five elements of the earth and water, energy, air, and space that make up our atmosphere and provide human and animal support and life. The basis of all kinds of vegetation and all kinds of human activity. These things are interpreted as manifestations of the Absolute, and man is set to preserve these features in his eternal well-being by cleverly performing the tasks set forth in this by various Vedic religious texts. A traditional idea developed in the Upanishads, the universe is divided into five basic elements, 1. Earth 2. Water 3. Light 4. Wind and 5. Ether.

Nature preserves the balance between these parts or things and living things. Interruptions in the percentages of any part of the ecosystem beyond certain limits can interfere with ecological balance, and any change in ecological balance can cause a host of cosmological problems. Different parts of the environment are compatible with each other and the relationships that are set. Human relations with nature are so natural that they cannot survive without them. We spend as much food as it is consumed by the United Kingdom. Food Losses in Supply Chains of Fruits, Vegetables, Onions and Potatoes in the Field, Retail and Consumer Accounts are very high due to lack of effective, economical and reliable traditional technologies. Approximately 1 lakh tonnes of solid municipal waste daily in India. That is about 36.5 million tons per year. The generation of waste per capita in Indian cities ranges from 0.2 kg to 0.6 kg. The calorie value of Indian solid waste is between 600 and 800 K cal / Kg and the waste collection is between 330 and 560 Kg / m³. Of all municipal waste collected, an average of 94% is disposed of on the ground and 5% is collected. Recycling means turning waste into profit. Recycling means recycling biodiversity - whatever it once was - became useful alternatives. Composting is naturally done and requires minimal energy input. Indian trash is experiencing the following changes:

In the next 10 years, the organic waste volume will increase to 60% because of the increased population & also in vegetable-based industries Organic waste increases from 40 percent to 60 percent [1].

Organic matter – anything Once alive can be converted into compost. Composting is a natural process of 'decomposition, Decomposition of organic matter by Microorganisms under controlled conditions. Compost is an important component of organic farming. Compost is an organic matter

Raw organic materials for composting is taken from

- Kitchen waste

Crop residues

- Animal waste

Recycling at the source is very economical and environmental & is Friendly method of waste management

In India, the bigger the wedding, the larger the party, and the more will be the waste. weddings and banquets are a huge source of wastage, but restaurants and hotels also contribute to such wastage. Damage the country's economy as it brings-

1. Lose to Farmers because wastages are not paid
2. Whole Sale Traders take account of wastages & price are fixed accordingly to consumers.

Kitchen Waste contributes a large segment of waste as Population is directly proportional to consumption & waste produce.

Food loss and waste generate about 8 percent of global greenhouse gas emissions. Approximately 40% of food waste in industrialized countries is from retail and consumer level. You can certainly reduce food at your personal level of food waste. Traditional Indian way to tangle is redistribution & converting it to animal feed. Food Waste as Animal Feed to Replace commercial expensive Animal feed & are emerging opportunities for use of waste. Feeding food scraps to animals has been in practice for many years. The variability among batches of food waste, feeding waste to animals is still feasible. in 2010, 2.2 MT of food by-products were diverted to animal feed in the UK. In the US, reportedly, 84–86.8% of food waste was diverted to either animal feed. Much of the food waste is given to swine and to cattle. A Minnesota company collected food scraps from restaurants, hotels, schools, nursing homes, grocery stores, and large food processors for this purpose. According to a report by Indian Grassland and Fodder Research Institute (IGFRI), India is currently facing a shortfall accounting to 35.6 percent for green fodder, 11 percent for dry crop residues fodder, and 44 percent for concentrate feed ingredients [2].

Farmers are struggling to earn a livelihood due to the unavailability of quality fodder and high cost of cattle feed, Angad Dev Veterinary and Animal Sciences University (GADVASU) is making waste of wealth. The university has experimented with recycling food waste, surplus fruit, vegetables, and their processing back to the food chain by converting it into animal feed. These products are rich in protein, Coarbonate& fat and energy . Based on their nutritive value these can be used either as roughage or as a protein source in the concentrate mixture. Most of these wastes have high acceptability and palatability among livestock. Since 1988, Barthold Recycling & Roll-off Services has collected food from restaurants, hotels, schools, nursing homes, grocery stores and even large food processors to feed 3,800 pigs and 250 head of cattle on its 290-acre facility. Today, Barthold collects food scraps from about 400 commercial customers in the St. Francis, Minnesota area each month.

In 1951, the Federal government and the State of Minnesota Department of Animal Health required haulers and farmers to process or cook food before feeding it to animals to kill harmful bacteria. In order to comply, Barthold pioneered a method of cooking the food scraps in the trucks after collection. Steam pipes are hooked to the truck for 20 minutes, increasing the temperature enough to kill potentially harmful bacteria. Once cooked, the food waste is fed to the pigs and cows. Barthold operates a full circle practice by also composting the manure from the animals for fertilizer used both onsite and offsite, Customers save money by paying Barthold to haul their food waste and feed it to pigs and cattle because it reduces taxes, disposal costs, and fees at landfills. Customers pay 30% less to recycle their food waste instead of throwing it away. The use of waste food reduces the cost of animal feed, leading to higher profit for livestock farmers. Mitigation of environmental problems due to the decomposition of such wastes is an additional bonus [3].

Methods to control Vegetable Waste

It is estimated by the UN that nearly 40% of the food produced in India is wasted or lost by different modes. This costs India one lakh crore rupees every year, which also affects our GDP.

- India ranks 63 among 88 countries in the Global Hunger Index (GHI, UN data).
- Entire South Asia wastes around 2.7% of food during processing.

Food wastage in India is starts from primary levels: harvesting → transporting → processing → packaging → consuming. Each step contributes for food wastage. This is caused due to the loopholes in the management and lack of advanced knowledge systems

in India. India wastes fruits and vegetables worth Rs 13,300 crore every year: Emerson study India, the world’s second-largest producer of fruits and vegetables is throwing away fresh produce worth Rs 13,300 crore every year because of the country’s lack of adequate cold storage facilities and refrigerated transport, according to data compiled in a new report by Emerson Climate Technologies India, a business of the US-based manufacturing and technology company Emerson.

The Emerson food wastage and cold storage report cite studies that have pegged the value of fruits, vegetables, and grains wastage in India at Rs 44,000 crore annually. Fruits and vegetables account for the largest portion of that wastage. Eighteen percent of India’s fruit and vegetable production – valued at Rs 13,300 crore – is wasted annually, according to data from the Central Institute of Post-Harvest Engineering and Technology (CIPHET). India has 6,300 cold storage facilities unevenly spread across the country, with an installed capacity of 30.11 million metric tonnes. Studies have shown this is half the amount of cold storage facilities that India actually needs. Cold storage capacity for all food products in the country should be more than 61 [4] (Figure 1).

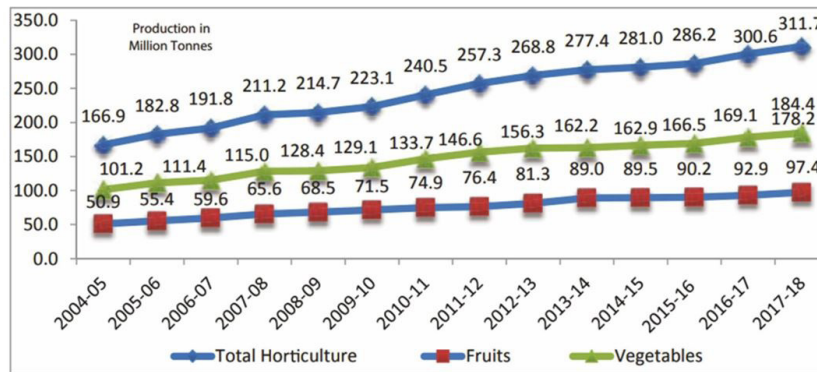


Figure 1: Cold storage capacity for all food products in the country

The global food waste management market size was estimated at USD 32.64 billion in 2018 and is anticipated to expand at a CAGR of 5.0% over the forecast period. Rapid industrialization and rising R&D activities for developing efficient systems are expected to have a positive influence on the growth.

Rising use of organic waste for the production of animal feed and fertilizers, reducing greenhouse emissions, and growing energy requirements are the factors projected to drive demand for the food waste management systems. Increasing consumption of processed food, including ready-to-eat meals, is also likely to boost the demand [5] (Figure 2).

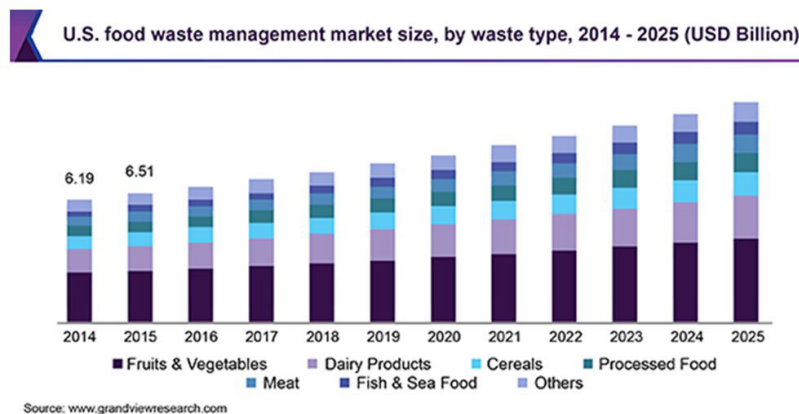


Figure 2: Increasing consumption of processed food

Fruits and vegetables accounted for a larger revenue share of more than 40.6% in 2018 due to poor management, storage, processing, and product cultivation. Most fruits and vegetables are consumed during the production and harvesting period. Poor maintenance and handling of new products has resulted in waste, which, in turn is expected to result in higher losses as compared to other components. Invisible dietary components, such as juice pulp, Whey permeate, used cereals that is considered animal feed are collected and separated before feeding. Animal food production is a natural and economical way of managing food waste. However, only certain types of food contaminants, such as cereals, fruits and vegetables, dairy products, fish, and meat, are used as animal foods. The food the service segment is expected to witness significant growth during the forecast period. The factors driving this segment are overload, obesity, inefficiency, poor productivity, and overproduction leading to a large number of waste generated before giving it to consumers. These service providers include hotels, restaurants, street vendors, and coffee shops [6].

The types of waste generated by primary producers include cereals, dairy products, fruits and vegetables, meat, and fish. These producers are involved in agricultural activities such as farming, animal husbandry, and fishing. Loss due to spillage, poor crop harvest, and animal death are the factors contributing to the generation of food wastage. Below provided Table 1 presents a picture of comparative studies

SN	Waste Type	Use / Application	2014 - 2025 Source	Region
1	Cereals	Animal Feed	Primary Food Producers	North America
2	Dairy Products	Fertilizers	FoodManufacturers	U.S.
3	Fruits & Vegetables	Power Generation Biofuel	Food Distributors & Suppliers	Europe
4	Meat	Power Generation	Food Service Providers	Germany
5	Fish & Sea Food	Animal Feed	Food Service Providers	U.K.
6	Processed Food	Animal Feed	Municipalities & Households	Asia Pacific
8	Other			China

Table 1: Food wastage in India starts from primary levels: harvesting → transporting → processing

Don't Peel your Fruits or Better Use Them

The peel has a high amount of fibers, it's overall weight is very low compared to that of the fruit. Also, in many cases, even after been thoroughly washed, it will have a higher content of agro toxics, If you want to have an apple and eat it's skin, go for it - after washing it well (if possible even after keeping it in a water + chlorine solution for a few minutes). The same goes for potatoes (I love the whole, no peeling), carrots and others. Banana peels, however, might be edible, but are really gross. Jackfruit peel on the other hand is completely inedible. While there are certain compounds found only in the skins of fruits and vegetables, such as resveratrol in red grapes, most nutrients found in the skin are also in the flesh. For example, lycopene, a pigment with antioxidant properties, is found throughout tomatoes and red bell peppers, not just in the skin [7].

According to the United States Department of Agriculture, a large red apple with its skin intact contains about 5 grams of fiber, 13 milligrams of calcium, 239 milligrams of potassium, and 10 milligrams of vitamin C. But remove the skin, and it still contains about 3 grams of fiber, 11 milligrams of calcium, 194 milligrams of potassium, and plenty of its vitamin C and other nutrients. So if a dislike for skin is standing in the way of you eating certain types of produce, don't feel too guilty about removing it. You'll still be consuming a lot more nutrients than if you skipped those fruits and vegetables entirely. peel of fruits and veggies contain most of the fiber and for oranges, lemon, and other citrus fruits the skin contains most of the vitamin C.

Providing the most vitamins, minerals, anti-oxidants, and anti-inflammation agents, for most fruit and vegetables, it's the peel. Some fruits and vegetables such as oranges pineapple, bananas, mangoes, durian, and many others, the peel contains oils and natural chemicals that can either burn you or contain a poison. For most others, certainly most vegetables, the peel should certainly be eaten. This habit will certainly reduce tones of vegetable waste & without any extra cost add nutrients to the human body. Wastage of food is not only indicative of hunger, climate change or pollution, but also of many other economic pitfalls in the economy, such as inflation. It is the responsibility of each and every person to understand the importance of food and to try and reduce food wastage as much as possible. At the individual level, the following steps can be taken to avoid food wastage:

- Store foods carefully
- Donate accumulated food
- Freeze food
- Use Old Fruits & Veggies: Rather than tossing fruits and veggies that are about to spoil, use them to create fruit salads, smoothies, and more
- Eat leftovers

In addition, new technologies can help reduce wastage such as improved rice-storage bags in the Philippines have helped cut losses of the staple grain by 15 percent.

Tips to Prevent Food Wastage in Big Parties

Control Greed for Hunger: Sometimes people get obsessed with the variety of tasty food in the parties and start taking more and more into the plate without actually measuring their appetite. Ultimately when they start eating they feel that they cannot eat what they have taken into their plate. Hence the food they are not able to eat gets wasted. Hence we should always judge our hunger and appetite first and then only take into the plate as much as we can eat. If we want more we can always go and take more so we should not fill our plate unnecessarily for the first time [8].

Educate & Monitor the Children regarding Wastages: Many times children account for more food wastage in the parties compared to the adults. Small kids do not understand the importance of avoiding food wastage and end up taking into the plate everything just for the sake of taking. They are not able to eat much and also many items they don't like. Hence they end up wasting the food. Here it is the responsibility of the parents to stay with their a child, when they are taking food or food, is being served to them and ensure that they only take what they like and as much they can eat. They should also educate their children about food wastage and make them conscious regarding this. If a child is very small then parents should ensure that they feed them from their plate instead of taking a separate plate for them. Also, care should be taken that children do not spill and drop the food while eating as this also leads to wastage.

Instruct the Caterers: Now let us talk a little bit about the host's role in eliminating wastage. Party hosts should clearly instruct their caterers not to put too much at a time in children's plates. Even if they ask they should instruct them to politely deny them telling them that they can take after finishing the earlier one. For the adults also caterers should be instructed not to put too much at a time in the plate while serving. If people want more they can always request the caterer to add more.

Keep 25 % empty Stomach for Water so as your Plate: One of the common things that happen with the guests at the party is that after seeing so many food items they get greedy and fill their plate with all of them and make it crowded. But when they start eating they get confused about seeing so many items on the plate and they are not able to eat anyone properly. This is human psychology that if you will have too many things in your plate to eat you will feel half full on just seeing the food items and not feel like eating more. Too many things on the plate will also make the plate crowded and things get messed up as well. For example, curry gravy mixes with the sweet item and makes the chapattis in the plate soggy. Hence it is always better to take a few items at a time on the plate, enjoy their taste and finish them and later go for more. Some guests fill up their plate thinking that who will go again and again to take the food and they sometimes also feel shy in going to the caterer, again and again, to ask for more. I think they should not have this kind of feeling.

Propagate advantages of Saving Food: Apart from these normal ways hosts of the party should try to apply some innovative ways in reducing the wastage. They should try to do things like displaying the banners and placards in the party hall where the food is served saying "Food is precious. Do not waste it", "Take only what you want" etc. Hosts can also keep small prizes like chocolates or small gift items for the kids whose plates are clean and empty just to motivate them not to waste the food.

Tips to prevent Food Waste Management in Restaurants- Clean your plate

In China, the "clean your plate" campaign has received millions of mentions on Weibo, and prominent coverage in the official Party newspaper The People's Daily, and led prime-time evening news on the government's CCTV-1. Not bad for an idea dreamed up by a few friends around a dining table.

In the months since the campaign was launched, many restaurants in Beijing and beyond have started offering smaller portions, encouraging guests to take doggy bags, and giving out certificates to those who clean their plates. Zero Waste Scotland's research showed that two-fifth of customers are often too shy to ask for a 'doggy bag' however when offered to take their leftovers home the majority of customers accept. Their Good to Go Scheme has since been developed to reduce this food waste by giving customers an easy way to take uneaten food home thus saving food from the bin. The boxes also address the safety fears of the customers by providing with instructions for keeping the food safe. Participating restaurants have found that where customers were proactively offered doggy bags their average food waste was reduced by up to 42%. Some also reported an increase in sales by being part of the Good to Go scheme as customers who weren't sure if they could manage additional courses ordered them when they knew they could take any leftovers home [9].

Tips to prevent Kitchen Waste

- Keep a running list of meals and the ingredients that your household already enjoys. That way, you can easily choose, shop for, and prepare meals.
- Make your shopping list based on how many meals you'll eat at home. Will you eat out this week? How often?
- Plan your meals for the week before you go shopping and buy only the things needed for those meals.
- Include quantities on your shopping list noting how many meals you'll make with each item to avoid overbuying. For example: salad greens - enough for two lunches.
- Look in your refrigerator and cupboards first to avoid buying food you already have, make a list each week of what needs to be used up and plan upcoming meals around it.
- Buy only what you need and will use. Buying in bulk It only saves money if you are able to use the food before it spoils.

Tips to prevent Food Industry Waste

British Retail Consortium (BRC) Waste

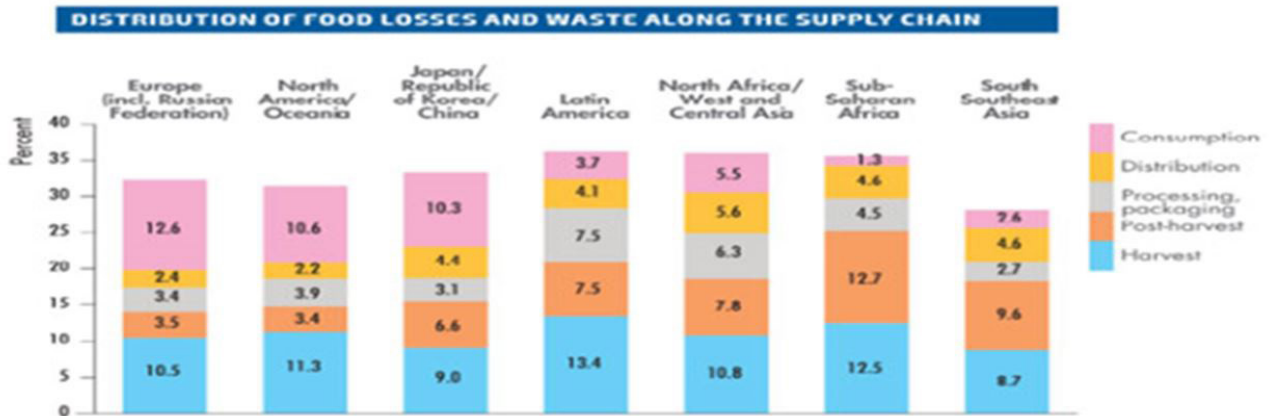


Figure 3: Reducing food waste from farm to fork

Under the BRC's 'A Better Retailing Climate' initiative, the UK's seven largest retailers have published annual food waste figures since 2013. As they represent approximately 82.5% of the food waste market, this is then used by resource charity WRAP to calculate figures for the whole of the UK (Figure 3).

Vegetable Solid Waste Scenario in India

According to the report in the journal, up to 40 per cent of the food produced in India is bound to get wasted. About 21 million tonnes of India's entire wheat produce are wasted and 50 per cent of all the food across the world meets the same fate. Such a situation raises a concern that food 'never reaches the needy'. In fact, according to the agriculture ministry, Rs 50,000 crore worth of food produced is wasted every year in the country [10] (Figure 4).



(Source: report of committee on world food security, FAO)

Figure 4: Report of committee on world food security, FAO

Management of Vegetable Solid Waste

Delicious Things You Won't Believe You Can Make With leftover Roti

- Chapati Chips
- Roti Chiwda
- Chapati Noodles
- Roti Cutlet (Figure 5)



Figure 5: Chapati Noodles, Roti Chiwda

But now a days its going out of fashion to cook, earlier it was our tradition.

As Food for Animal

Food for Animals

In India feeding cattle is seen as a religious entity, so number of houses in the city keeps leftover & raw food wastages for cow& other domestic animals. It seems to be the cheapest & earliest way of waste disposal without any financial burden. In turn, cattle produce cow dunk uses to prepare cow dunk cake for fuel. Dried cow dung is an excellent fuel. In some cultures dung from domestic cows or buffalo is routinely collected and dried for fuel, sometimes after being mixed with straw. Pieces of dung are lit to provide heat and a flame for cooking, Production, and Uses of a Biogas (Figure 6).



Figure 6: Pieces of dung are lit to provide heat and a flame for cooking, Production, and Uses of a Biogas

Benefits of Food Recycling Through Animal Feed

- Reduced pressure on landfills
- Cattle farmers save money from buying animal feed
- Reduce methane emissions from fruits & vegetables to lower carbon footprints
- Good for the economy

The general process for making an anaerobic digester for cow dung starts with placing dung and water in an airtight container. The container must be kept warm and left undisturbed so that bacteria can do their work. The gas that is produced is withdrawn through a tube and stored.

Cow Dunk Use

Insect Repellent, Disinfectant, Manures, etc

The smoke from burning cow dung has been found to repel insects, including mosquitoes. This has led to the deliberate use of cow dung as an insect repellent in some areas. It would be interesting to know whether the smoke from the dung is a more effective repellent than the smoke from other fuels. Many people are aware that cow manure can make good fertilizer and are reminded of this every time they pass a fertilized and odoriferous field. Cow manure is rich in minerals, especially nitrogen, phosphorus, and potassium. It can support the growth of beneficial microorganisms when it's mixed with soil. Manure can also improve the texture of the soil and help it to maintain moisture.

Recycling food residuals into animal feed would be practical when applied to large industries, such as grocery stores. A 2012 report by India's Regional Centre for Urban and Environmental Studies states that "animals are the part of the solution, not the problem. The livestock's potential contribution to solving environmental problems is equally large. The livestock contributes to tackling our environmental degradation by a variety of ways." By 2012 the park kept 4 chickens, 21 ducks, 6 pigs, and other animals for different functions. Chickens are benefited from the insects in the waste, whilst pigs would gulp the food waste collected from hotels. Ducks take care of the leftovers collected from the fish market. Dogs are in charge of domestic leftovers. The 'park farm' is probably the first in the world to implement animal feed on a municipal level (Figure 7).



Figure 7: Solid Waste Management Park in Bobbili, India

The animal farm takes its inspiration from the history of feeding animals with organic waste. Dogs, especially domesticated ones, are effective in taking care of meat scraps. As a common practice in traditional pig farming, pigs often consume the leftovers, rather than energy and cost-intensive crops. Ducks and chickens respectively favor kitchen scraps and milling by-products. Given the extraordinary effectiveness of earthworms to decompose vegetable and food wastes, vermicompost is another key of this living waste management system.

To convert Sand into Fertile Soil

Use of Vegetable Waste to convert Sand to Fertile Soil in Desert Areas like in Rajasthan & Gujarat

We can use biological, ecological and industrial waste and crop straw decomposition to develop soil amendments, fertilizer, organic fertilizer and other manufacturing industries. To better control desertification and improve soil quality, we set out to cultivate organic farms and develop land economy, reduce sand layer, turn waste into resources and form one comprehensive desert ecological industry chain that is low-carbon, recyclable and pollution-free. Chinese scientists have claimed to have converted sand into fertile soil using a new method which they hope will be useful to fight desertification. A team of researchers from Chongqing Jiaotong University has developed a paste made of plant cellulose from leftover that, when added to sand, it helps it retain water, nutrients, and air (Figure 8).



Figure 8: A 1.6-hectare sandy plot in Ulan Buh Desert in Inner Mongolia Autonomous Region, north China, has been transformed into fertile land, yielding rice, corn, tomato.

Conclusion

When old traditional way is compared to new emerging technologies regarding waste management its self evitable that preventing waste formation or minimizing at initial stage is more comfortable to economics & environment so as to human .As earlier said waste is the out of human brain,it need to be rationalized with ample proof, evidences to change mental orientation to tackle organic waste. Everything got as waste is useful to one or another purpose but need detail studies. Every nation must have their waste prevention units/departments to avoid accumulation of waste .Finally waste brain procure waste thoughts and leads to waste production. Why don't we prepare life style for no waste from harvesting to consumption?

References

1. Peng W, Ma Q, Wang Z, Xie Z (2019) Research Progress On Comprehensive Utilization Of Fruit And Vegetable Waste , E3S Web of Conferences 131: 01106.
2. Sagar NA, Pareek S, Sharma S, Yahia EM, Lobo MG (2018) Fruit and Vegetable Waste: Bioactive Compounds, Their Extraction, and Possible Utilization. *Compr Rev Food Sci Food Saf* 17: 512-31.
3. Khattak KF, Rahman TU (2017) Analysis of vegetable's peels as a natural source of vitamins and minerals. *Int Food Res J* 24: 292-7.
4. Oberoi HS, Chavan Y, Bansal S, Dhillon GS (2010) Production of cellulases through solid state fermentation using kinnow pulp as a major substrate. *Food Bioprocess Tech* 3: 528-36.
5. Brooks PH, JD Beal, S Niven (2001) Liquid feeding of pigs: potential for reducing environmental impact and for improving productivity and food safety. *Recent Adv Anim Nutr Aust* 13: 49-63.
6. Sayeki M, Kitagawa T, Matsumoto M, Nishiyama A, Miyoshi K, et al. (2001) Chemical composition and energy value of dried meal from food waste as feedstuff in swine and cattle. *Anim Sci J* 72: 34-40.
7. Dieu TM Tran, Truong M Le, Viet T Nguyen (2014) Composition and Generation Rate of Household Solid Waste: Reuse and Recycling Ability - A case study in District 1st , Ho Chi Minh City, Vietnam. *Int J Environ Prot* 4: 73-81.
8. Furedy C, Virginia Maclaren (1999) Reuse of waste for food production in Asian cities: Health and Economic Perspectives.
9. Adak A, Kuila A, Singh A (2012) Utilization of Vegetable Wastes for Bioenergy Generation. *Agric Res* 1: 213-22.
10. Laufenberg G, Kunza B, Nystroem M (2003) Transformation of vegetable waste into value added products: (A) the upgrading concept; (B) practical implementations. *Bioresource Technol* 87: 167-98.