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RESEARCH ARTICLE

FOOD WASTE MANAGEMENT: A GLOBAL ISSUE

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ABSTRACT

The increased generation of food waste is a global and national problem. It has several facets, all of which can benefit from a clear understanding of the size and nature of the food waste generated across all phases of food production and consumption cycle. Food donation is the best and easiest method to reduce food waste and reduce the global issue of hunger. The objective of this paper is to review the waste of food, to reuse food waste in simple and easy method in order to reduce food waste to maintain healthy environment.

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INTRODUCTION

India stands second in the production of Fruits and Vegetables in the world. It contributes about 10% as well as14% of Fruits and Vegetables in the world production. (Harender and Guleria 2007) Vegetable Wastes are created during harvesting, transportation, storage, marketing and processing. Due to their nature and composition, they deteriorate easily and cause foul smell production. In recent years, solid waste treatment has become a serious issue worldwide. (Park, Tsuno *et al*., 2008) Material waste is a by-product of almost all human activities and results in stress and pollution in the environment. Total waste production is not directly proportional to the economic development of the country. Waste prevention is the primary goal of the waste management. Solid waste generation is increasing gradually with the passage of time due to population explosion and urbanization. Each urban resident generates 0.35–1.0 kg of solid waste every day. (Upadhyay, Prasad *et al*., 2005). The components of kitchen waste include spoilt vegetables, peelings and trimmings, fruit skins, spoilt fruit, cooked and uncooked meat, bones, fats, egg-shells, used teabags, coffee grounds, bread and pastries, cooked food waste, tissue papers, packing materials, plastics, glass and water, etc. Due to relatively high moisture content of kitchen waste, bioconversion technologies such as anaerobic digestion are more suitable as compared to thermo-chemical conversion technologies, viz. combustion and gasification (Zhang, Hamed *et al*., 2007). Recently organic wastes have been recognized as reusable resources and biological treatment of organic solid wastes has considerably increased. The high moisture and organic content in these wastes can be utilized in biological treatment like anaerobic digestion than in other techniques like incineration and composting. Conventional treatment methods for solid waste treatment are composting, land filling and incineration, etc. (Schaub and Leonard, 1996) (Zhang, Hamed *et al*., 2007) But these techniques have severe environmental issues associated with them such as air pollution and leachate flow from dumped waste causing water contamination, etc. Kitchen wastes have high organic content, most of which is composed of easily biodegradable compounds such as carbohydrates, proteins, and smaller lipid molecules. As a result of these characteristics, interest in anaerobic digestion has increased for the efficient management of kitchen waste. (Park, Tsuno *et al*., 2008) Food waste or food loss is food that is discarded or lost uneaten. The causes of food waste or loss are numerous, and occur at the stages of production, processing, retailing and consumption. The definition of waste is a contentious subject, often defined on a situational basis; this also applies to food waste. (Westendorf, 2000) A 2011 study by the Swedish Institute for Food and Biotechnology (SIK) on behalf of Food and Agriculture Organization of the United Nations (FAO), *Global Food Losses and Food Waste*,

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distinguishes between "food loss" and "food waste", and provides figures for both:

- **Food loss** measures the decrease in edible food mass (excluding inedible parts and seed) "throughout the part of the supply chain that specifically leads to edible food for human consumption", that is, loss at the production, postharvest and processing stages. This definition of loss includes biomass originally meant for human consumption but eventually used for some other purpose, such as fuel or animal feed.
- **Food waste** is food loss occurring during the retail and final consumption stages due to the behavior of retailers and consumers that is, the throwing away of food.

Causes

1. Production

In developing and developed countries which operate either commercial or industrial agriculture, food waste can occur at most stages of the food industry and in significant amounts. In subsistence agriculture, the amounts of food waste are unknown, but are likely to be insignificant by comparison, due to the limited stages at which waste can occur, and given that food is grown for projected need as opposed to a global marketplace demand. (Waters and Tony, 2007) Nevertheless, on-farm losses in storage in developing countries, particularly in African countries, can be high although the exact nature of such losses is much debated. Research into the food industry of the United States, whose food supply is the most diverse and abundant of any country in the world, found food waste occurring at the beginning of food production. From planting, crops can be subjected to pest infestations and severe weather, (Rosenzweig, Cynthia *et al*., 2001).

2. Food processing

Food waste continues in the post-harvest stage, but the amounts of post-harvest loss involved are relatively unknown and difficult to estimate. Regardless, the variety of factors that contribute to food waste, both biological/environmental and socio-economical, would limit the usefulness and reliability of general figures. In storage, considerable quantitative losses can be attributed to pests and micro-organisms. This is a particular problem for countries that experience a combination of heat (around 30 °C) and ambient humidity (between 70 and 90 per cent), as such conditions encourage the reproduction of insect pests and micro-organisms. Losses in the nutritional value, caloric value and edibility of crops, by extremes of temperature, humidity or the action of micro-organisms, also account for food waste; these "qualitative losses" are more difficult to assess than quantitative ones. Further losses are generated in the handling of food and by shrinkage in weight or volume. (Hall and David Wylie, 1970)

3. Retail

Retail stores can throw away large quantities of food. Usually, this consists of items that have reached their either their best before, sell-by or use-by dates. Food that passed the best before, and sell-by date, and even some food that passed the use-by date is still edible at the time of disposal, but stores have widely varying policies to handle the excess food. Some stores put effort into preventing access to poor or homeless people, while others work with charitable organizations to distribute food. Retailers also contribute to waste as a result of their contractual arrangements with suppliers. Failure to supply agreed quantities renders farmers or processors liable to have their contracts cancelled. As a consequence, they plan to produce more than actually required to meet the contract, to have a margin of error. Surplus production is often simply disposed (Stuart and Tristram, 2009).

Reduction and Disposal of food waste

An initiative in Curitiba, Brazil called Cambio Verde allows farmers to provide surplus produce (produce they would otherwise discard due to too low prices) to people that bring glass and metal to recycling facilities (to encourage further waste reduction). In Europe, the Food Surplus Entrepreneurs Network (FSE Network), coordinates a network of social businesses and nonprofit initiatives with the goal to spread best practices to increase the use of surplus food and reduction of food waste. (Depouillon and Joris, 2015)

Landfills and greenhouse gases

Dumping food waste in a landfill causes odour as it decomposes, attracts flies and vermin, and has the potential to add biological oxygen demand (BOD) to the leachate. The European Union Landfill Directive and Waste Regulations, like regulations in other countries, enjoin diverting organic wastes away from landfill disposal for these reasons. In countries such as the United States and the United Kingdom, food scraps constitute around 19% of the waste dumped in landfills, where it ends up rotting and producing methane, a greenhouse gas. (From Farm to Fridge to Garbage Can.// The New York Times, 1.11.2010)

Composting

Inevitable waste: peels of potato, onion, lemon, tangerine, banana, kiwi, egg. Food waste can be biodegraded by composting, and reused to fertilize soil. Food waste can be composted at home, avoiding central collection entirely, and many local authorities have schemes to provide subsidised composting bin systems. However, the proportion of the population willing to dispose of their food waste in that way may be limited. (Sullivan, Bary *et al*., 2002)

Anaerobic digestion

Anaerobic digestion produces both useful gaseous products and a solid fibrous "compostable" material. Anaerobic digestion plants can provide energy from waste by burning the methane created from food and other organic wastes to generate electricity, defraying the plants' costs and reducing greenhouse gas emissions. Food waste coming through the sanitary sewers from garbage disposal units is treated along with other sewage and contributes to sludge. (Wang, Tay *et al*., 2002)

Conclusion

Food waste is a global issue of nation. It includes leftover (cooked food), spoilt vegetables, peeling and trimmings, fruits skins etc. Due to high moisture content and organic content in the food wastes can be utilized in like inceration, landfilling,

composting, anaerobic digestion etc. Therefore, it is important to improve food waste management in order to minimize potential human and environment risks. There are several causes of food waste. It can be controlled by using some easy and practical tips to save food from being waste like, when you go to food shopping, make sure donot buy too much food. You should be thoughtful and careful about what you purchase. Plan out your meals and according to that enlist them during purchasing stick to that list. Make sure you save uneaten food when you either cook too much or you get too much food at a restaurant. Label your leftovers so you can keep track of how long they've been in your freezer.

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