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Agriculture circular economy Indian railways distributing farm compost

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Abstract

India ranks 100 in 119 countries on global hungry index. India being the second largest food producer wastes 40 percent of it. The paper proposes a closed loop agriculture circular economy to serve fruits to passengers in Indian railways and process the collected fruit peel to make organic compost. The compost to be distributed to farmers free of cost. The paper proposes to generate rural employment opportunities.

Keywords: food wastage, circular economy, employment

Introduction

Zero hunger, SDG goal 2, aims to end hunger and malnutrition by 2030^[1]. According to the estimates of UN food and agriculture Organisation (FAO), about 40 percent of fruit produce of worth 8.3 billion US dollars, perishes before reaching shoppers^[2]. Many budgets of working-class urban families allocate 31 percent of expenditure on food^[2]. Due to perishable nature, 35 to 40 percent losses are attributed to deterioration^[2]. Every human needs to consume 85 grams fruit everyday^[2]. Thus, storage of fruits for an extended time to enjoy fruits in offseason is an important necessity^[2].

Literature Survey: India is the seventh largest country in the world and it is the second largest producer of food^[3]. The Indian food industry amounts to USD 448 billion, growing at 10 percent annually and contributes to 9-10 percent manufacturing GDP^[3]. About 210 million farmers and agricultural labourers cultivate and harvest crops across India to sell them in 2477 APMC-Agriculture Produce Market Committee and 4843 sub-market yards^[3]. Approximately 14000 organised retails outlets and 12-14 million unorganized retails outlets spread over 5000 towns and 6,00,000 villages constitute the supply chains to distribute food products in INDIA^[3]. One out of nine people on earth have little food to lead a healthy life^[4]. In Europe and North America, the percapita waste by a single consumer is between 95-115kg a year^[4]. It is stated that India wastes so much food as the whole of United Kingdom consumes. In the global Hungry index-2017, out of 119 countries, India ranks 100^[4]. The developing nation India loses 40 percent of its food in post-harvesting and processing levels^[4]. It is estimated that 230 cubic kilometers of fresh water goes into producing food which is wasted, viz. water enough to quench the thirst of 10 crore people each year^[4]. The state of hunger in India is that 38.4 percent children are malnourished and 51.4 percent women in reproductive age (15-49) are anaemic^[4]. Food wastage leads to global warming as the landfilled rotten food releases methane, carbondioxide and chlorofluorocarbons^[4]. As per estimates, India wastes 1.3 billion tonnes of food, fruits and vegetables wastage amounts to 45 percent of it^[4]. Food waste: wholesome edible material intended for human consumption, arising at any point in the food supply chain that is instead discarded, lost, degraded or consumed by pests^[5]. The post-harvest crop losses in USA are estimated to be 2 to 23 percent, depending upon the commodity, with an overall average of 12 percent^[5]. The daily average loss of energy from food on plate waste amounts to 8.9 percent of daily per person dietary energy consumption^[5]. The two categories of wastage are – cooked, prepared or served too much, and not used in time^[5].

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Methodology

India, being the largest producer of fruits, such fruits are to be carefully stored. Since, fruits are a perishable goods, wastage due to fruits getting rotten is more. Thus, such fruits must be consumed in-time. The methodology proposes, Indian railways being the largest employer of the country, let fruits be supplied to passengers inside trains at a price less than market price. Let fruits be sold in trains instead of tea, coffee and other beverages. It would enhance general health of passengers since it inculcates a healthy food habit among Indians.

Let the particular train be halted at a rural station to upload the required fruits into the pantry car. This provides rural livelihood and also the rural railway station could accommodate a mini-cold storage unit to preserve fruits. Let the cold storage be solar technology enabled.

The method poses a problem of solid waste management. The peel of fruits could be collected every day to make compost and manure for organic farming. Thus, Indian railways to make compost and manure, and distribute it free to farmers. Thus, Indian railways to assume a moral responsibility towards agriculture community and the country, as a part of social responsibility.

The 'take-make-throw' linear model must be transitioned to a new economic model-THE CIRCULAR ECONOMY- a model to maintain the integrity and prosperity of earth systems [6]. Circular Economy is a systemic approach to economic development designed to benefit businesses, society and the environment [6]. The key principles of circular economy include design out waste; retain the highest value for the longest time; and maximize renewables [6]. To create a closed loop food system, in which input of one process is from the output of another process, is the path ahead [6].

The circular economy for agriculture and food demands to manage organic waste with an effective and efficient collection mechanism, processing into products and a value creation for circularity [6]. The paper proposes a closed loop circular economy in collecting peel of consumed fruits in trains, processing the compost and manure for agriculture farms and thus creates value to farmers and the society. The agriculture produce coming from farms is made compost and manure to be used in organic farming, thus forming a natural closed loop.

Conclusion

The paper proposes to avoid wastage of fruit by its consumption by passengers in journey. The paper inculcates a healthy food habit among railway passengers. The paper forms a closed loop circular economy to create value to the society. The solid waste produced in railways would be used to make manure for crop cultivation. Indian railways to distribute manure to farmers free of cost as a part of social responsibility. The paper generates rural employment in the form of solar-enabled cold storage units and other low level jobs.

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