

# Interrogating Food Waste Problems in the Context of Unorganized Retail Chain in India

Suparna Parya

## Abstract

*The following article tried to demonstrate the role of the retail chain to the effective management of the food waste. The same understanding could be helpful to encapsulate the problem of food waste in India. The following presents the current status of the problem of food waste in India and tried to draw attention on the tentative solution of the problem.*

**Key Words:** *Consumer Society, Utility Theory, Retail Chain,*

## Introduction

A highly populous country like India is envired with huge number of social and economic problems must pay attention the problem of food waste. A country which is preoccupied with overpopulation and hunger, food waste should be treated as a social malice. There are many causes of food waste, some are natural and environmental while some are rooted in the human management system. While developing an understanding on the issue of foreign direct investment in retail, the study suggests the unorganized retail industry is one of the major causes behind the problem of food waste in India. The following examines why and how the food waste problem is heavily rooted in the underdeveloped retail chain in India. For the

purpose of the study literatures have been reviewed to examine the problems. First, the article demonstrates the problem of food waste and why it should be treated as both social and economic problem. Secondly, it presents the very issue of unorganized retail chain as one of the major causes of the problem. Finally, the article tried to bring forth the tentative solution of the problem.

## What is food Waste?

To begin with, food waste or food loss is that which is left uneaten or discarded. Food loss is not only at the end of the chain, but also at the beginning from the time of production, processing, retailing and consumption. There are some serious environmental and social consequences of the food waste problem. The Institution of Mechanical Engineers estimates that annually between a third and a half of all food produced is wasted worldwide. (Fox, 2013)According to the Guardian, approximately 45% of all fruits and vegetables, 35% of fish and seafood, 30% of cereals, and 20% of meat and dairy products are wasted by suppliers, retailers, and consumers every year.

*The report, Food Wastage Footprint: Impacts on Natural Resources, is the first study to analyze the impacts of global food wastage from an environmental perspective, looking specifically at its consequences for the climate, water and land use, and biodiversity.*

*One of the key findings of the report is that food that is produced but not eaten each year guzzles up a volume of water equivalent to the annual flow of Russia's Volga River and is responsible for adding 3.3 billion tons of greenhouse gases to the planet's atmosphere. Similarly, 1.4 billion hectares of land – 28 per cent of the world's agricultural area – is used annually to produce food that is lost or wasted.*

*Beyond the environmental impacts, food wastage costs some \$750 billion annually to food producers. (UN R., 2013)*

With numbers as high as this, current systems in the country are not able to cope with the burden, subsequently leading to negative effects on the environment and public health. 25% of fresh water used to produce food is ultimately wasted, even as millions of people still don't have access to drinking water. When you calculate the figures in cubic kilometers, this is a bit more than an average river. Acres of land are deforested to grow food. Approximately 45% of India's land is degraded primarily due to deforestation, unsustainable agricultural practices, and excessive groundwater extraction to meet the food demand. 300 million barrels of oil are used to produce food that is ultimately wasted. Open landfills lead to the development of methane, which absorbs the sun's heat, warms the atmosphere and contributes to global warming. Annually, close to 21 million metric tons of wheat rots in India; a figure that is equal to Australia's total annual production (Chauhan, Sep 16, 2016). Methane is also known to cause fire or explosions. Further, several toxins and/or a black liquid known as leachate, oozes from the waste, which is absorbed by the soil/ground, leading to the contamination of ground water. These overflowing landfills have today become the root cause of blocked drains, soil and water pollution.

Furthermore, the problem of food waste is resulted into the uneven distribution of food among the people in a poverty ridden country like India. According to a survey done by Bhook (an organization working towards reducing hunger) in 2013, around 20 crore Indians sleep hungry on any given night. (Chauhan, Sep 16, 2016) Even though the world produces enough food to

feed twice the world's present population, food wastage is ironically behind the billions of people who are malnourished. The number of hungry people in India has increased by 65 million more than the population of France. According to a survey by Bhook (an organization working towards reducing hunger) in 2013, 20 crore Indians sleep hungry on any given night. About 7 million children died in 2012 because of hunger/malnutrition. According to Hindustan Times, around 67 million tones of food is wasted in India every year, which has a value of around Rs 92,000 crore. And it's enough to feed all of Bihar for a year. This value equals nearly two-thirds of the amount that the government needs to feed 600 million poor Indians with subsidized ration under the National Food Security program (Chauhan, Sep 16, 2016).

## Different Notions of Food Waste

Historically, there are some fundamental difference between developed and underdeveloped nations of the origin of the problem. Overproduction, overmerchandising, confusing food safety policies, false labor/waste trade-offs, customer choice are some of the important issues pertaining to the food waste problem in the developed countries; the story is completely different in case of the developing once.

*“there were fundamental changes in food consumption in Western Europe, North America and Australasia from 1800 to the 1950s prompted by rising incomes, increases in agricultural productivity and greater trade in food. As a result, the consumption of starchy staples declined and that of animal foods, sugar, vegetables and fruit increased. In 1961-2 the nutritional differences between the major regions largely reflected differences in income per capita with consumption*

*in Afro-Asia like that in Western Europe in the early nineteenth century. Since 1961-2 income increases in developing countries have led to increased consumption of all foods, as happened in nineteenth-century Western Europe, and even in a few countries the beginnings of a decline of the starchy staples. In contrast, income increases in the developed countries have not led to an increase in food consumption. Fears about the effect of nutrition upon health have led to a decline in the consumption of sugar, animal fats and milk products. (Grigg, 1999)”*

In less-developed countries, such as those of sub-Saharan Africa and South-East Asia, wastage tends to occur primarily at the farmer-producer end of the supply chain. Inefficient harvesting, inadequate local transportation and poor infrastructure mean that produce is frequently handled inappropriately and stored under unsuitable farm site conditions. As the development level of a country increases, so the food loss problem generally moves further up the supply chain with deficiencies in regional and national infrastructure having the largest impact (Fox, 2013).

### Why is food wastage a problem?

The Think, Eat, Save initiative, organized by the United Nations Environment Program and the Food and Agriculture Organization with partners, underlines the disparities between food production and consumption patterns in developed and developing countries (Bryce, 2013).

- Poor farmers harvest crops too early in response to a lack of food and money. ...
- Minimal farming technology such as plows, tractors, and pesticides.
- Inadequate market systems. ...

- Fresh produce, meat, and fish spoil in hot climates due to the lack of proper transportation.

According to the UN's Food and Agriculture Organization, "The waste of some 1.3 billion tons of food each year is causing economic losses of \$750 billion and significant damage to the environment, according to a United Nations report launched today (UN R. , 2013). Annually, close to `31 million (70-75%) of waste is dumped into open landfill sites. Globally, India currently ranks seventh in terms of overall food wastage agricultural produce, poultry and milk. Attempts have been made to quantify global food waste over several decades, motivated partly by the need to highlight the scale of 'waste' in relation to global malnutrition. Such assessments are reliant on limited datasets collected across the food supply chain (FSC) at different times and extrapolated to the larger picture. The most often quoted estimate is that 'as much as half of all food grown is lost or wasted before and after it reaches the consumer' (Lundqvist J., 2008). And these figures aren't just affecting the nation's economy and the environment. This grim reality points out another major issue in India, i.e. hunger.

Consumption is the process by which goods and services are, at last, put to final use by people. Consumption is at the end of the line of economic activities that starts with an evaluation of available resources and proceeds through production of goods and services and distribution of goods and services (or the means to acquire them) among people and groups. At last, the goods and services themselves come to be used. The effect of this consumption, including depletion of resources and generation of waste as well as enhancement of human survival and flourishing, determines the resource base for the next round of economic activity.

(Goodwin, Nelson, Ackerman, & Weisskopf, 2008)

Food waste in the global food supply chain is reviewed in relation to the prospects for feeding a population of nine billion by 2050. Different definitions of food waste with respect to the complexities of food supply chains (FSCs) are discussed. An international literature review found a dearth of data on food waste and estimates varied widely; those for post-harvest losses of grain in developing countries might be overestimated. As much of the post-harvest loss data for developing countries was collected over 30 years ago, current global losses cannot be quantified. A significant gap exists in the understanding of the food waste implications of the rapid development of CBRIC economies. The limited data suggest that losses are much higher at the immediate post-harvest stages in developing countries and higher for perishable foods across industrialized and developing economies alike. For affluent economies, post-consumer food waste accounts for the greatest overall losses. To supplement the fragmentary picture and to gain a forward view, interviews were conducted with international FSC experts. The analyses highlighted the scale of the problem, the scope for improved system efficiencies and the challenges of affecting behavioral change to reduce post-consumer waste in affluent population. (Parfitt, Barthel, & Macnaughton, 27 September 2010)

## Food Wastage Crisis in India Facts and Figures

The following facts and figures might highlight the severity of the issue more precisely. According to the BMC, Mumbai generates close to 9,400 metric tons of solid

waste per day, from which 73% is food, vegetable, and fruit waste, while only 3% is plastic. The garbage dumps in Mumbai are as tall as five or six story buildings

Delhi generates around 9000 metric tons of waste per day, with the country's largest landfill located in East Delhi. This landfill is 70 acres vast and contains close to 12 million tons of waste that are as high as 50 feet.

1. According to a UNICEF report, one-quarter of the world's undernourished live in India.
2. India ranks 55 out of 76 countries on the Global Hunger Index, lagging much poorer neighbors like Nepal (44) and Sri Lanka.
3. According to a report published by charity organization Oxfam, the number of hungry people has increased by 65 million between 1990-2005, which sums to be more than the entire population of France.
4. Each year, around 21 million metric tons of wheat rots in India. The figure is almost equal to Australia's total annual production.
5. To produce the food which ultimately gets wasted, India is estimated to use more than 230 cubic kilometres of fresh water annually, enough to provide drinking water to 100 million people a year.

## Indian Retail

Let us examine how retail chain can affect the food waste process. The retailers influence the activities of supply chains as they dictate the quality of the produce to be supplied and displayed in their outlets. Conditions within the retail outlet (temperature, relative humidity, lighting, gas composition, etc.) and handling practices influence on quality, shelf-life and

acceptability of the product. High losses at the retail stage occur in perishable commodities such as fruits and vegetables, fish and seafood, meat, dairy products, baked foods and cooked foods. In the United States of America alone, it was estimated that the in-store food losses were 10 percent of the total food supply (Buzby, Wells and Hyman, 2014). In Norway, according to the Format17 project (see Chapter 4) retail stage represents 18 percent of the FLW. Losses at the retail stage are even higher in situations where measures such as protective packaging, temperature and humidity control, and proper display to minimize handling by buyers, are not in place. In many open-air markets in developing countries, the traders sprinkle unclean water onto vegetables and fruits to minimize wilting and shrivelling under the hot sun. Such practices, which are aimed at slowing down deterioration, result in unsafe foods that are shunned by buyers and may end up being discarded. Some of the factors (drivers) seen to contribute significantly to the high losses at the retail stage include inappropriate product display and efforts to anticipate expectations of customers, including for convenience. In most retail outlets, piles of fresh-looking produce on display are a means to attract buyers, who then have the luxury to choose by rummaging through the pile. Products such as fruits at different ripening stages are piled together to give the buyer a choice. This has three effects that contribute to high losses at this stage: the produce at the bottom of the pile is damaged by the weight of the produce on top, piling fruits at different ripening stages shortens the shelf life of the produce that would otherwise have a longer shelf life because of the different ethylene production and respiration rates and, as the buyers rummage through the piles, they injure the other produce. Besides, the products of advanced ripening stages are more delicate and, when they are piled together with less-

ripe products, they suffer more mechanical injury. The storeowners seek to maintain a variety of products displayed in large volumes that are replenished regularly to fill the shelves for the consumer's satisfaction. When retailers mix different expiry dates for the same product, close-by expiry dates are ignored by the consumers, who prefer the "fresher/newer" products (SEPA, 2008). The tendency to propose homogenous and "perfect" products (in terms of colour, shape, size, freedom from blemishes) have led most retailers to set high standards for products. It is a major cause of loss, as failure to adhere to these standards by the producers results in rejection at delivery or culling of the displayed products. Most retailers have ventured into fresh-cut (fruits and vegetables) and ready-made fresh or cooked foods to meet the demand of the consumers. It can be an opportunity to valorize produce that failed to comply with cosmetic standards, but ready-made products are also more prone to spoilage – if they remain unsold at the end of the day, they are just discarded. Growth in fresh-cut produce has been. Poor adoption rates for interventions led to the recognition that a purely technical focus was inadequate for solving problems within the sector and a more holistic approach was developed (Grolleaud, 2002).

Retailing in India is predominantly unorganized. According to a survey by AT Kearney, an overwhelming proportion of the Rs. 400,000 crore retail markets are unorganized in India. In fact, only a Rs. 20,000 crore segments of the market is organized. The sector is highly fragmented with 97% of its business being run by the unorganized retailers like the traditional family run stores and corner stores. The sector is the largest source of employment after agriculture and has deep penetration into rural India generating more than 10% of India's GDP.

Rapid urbanization has created the need for extended food supply chain to feed urban populations. For these to be efficient, countries need improvements in roads, transportation and marketing infrastructure to keep food affordable for lower income groups. How these extended supply chains develop has implications for food waste globally, now and in the future.

— *Urbanization and the contraction of the agricultural sector. The proportion of the world's population employed in agriculture has declined in recent decades and 50 per cent of the world's population now lives in urban environments. This proportion is expected to rise to 70 per cent by 2050 (UN, World Urbanization Prospects. The 2007 Revision Population Database, 2008).*

India's retailing industry is essentially owner manned small shops. In 2010, larger format convenience stores and supermarkets accounted for about 4 percent of the industry, and these were present only in large urban centers. India's retail and logistics industry employs about 40 million Indians (3.3% of Indian population). The retail industry in India is highly fragmented and unorganized (Parya, 2014).

Another interesting fact is that, Indian retail has experienced limited growth, and its spoilage of food harvest is amongst the highest in the world, because of very limited integrated cold-chain and other infrastructure. India has only 5386 standalone cold storages, having a total capacity of 23.6 million metric tons. However, 80 % of this storage is used only for potatoes. The remaining infrastructure capacity is less than 1% of the annual farm output of India and grossly inadequate during peak harvest seasons. Farmers and producers had to go

through middlemen monopolies. The logistics and infrastructure were very poor. This leads to about 30% losses in certain perishable agricultural output in India, on average, every year (Parya, 2014).

Another important dimension of strengthening the retail chain network is the increasing process of globalization of the food market. India's GDP is heavily dependent upon the agricultural trade internationally

— *Increased globalization of trade. International trade in processed foods accounts for 10 per cent of total processed food sold (UN, Commodity Trade Data Base. New York,, 2002). Globalization may open up opportunities for agricultural exports while representing a threat to development of internal markets through competition from inexpensive imports of higher quality than can be produced locally. Linked to trade liberalization, multi-national chains have become a driving force in the rapid growth of supermarkets in many transitional economies.*

Thus, the globalization process have come to be another challenge of preserving and faster transportation of the food stuffs to compete the international market.

## Conclusion

What appears from the foregoing discussion, one thing is certain that India produces enough food to feed everyone? The above might suggest why the problem should be seriously addressed and systematic approach to study the causes are necessary. However, we have got to realize that in order to feed more, we need to waste less. With the global population estimated to reach 9.5

billion by 2075, mankind needs to ensure it has the food resources available to feed all these people. With current practices wasting up to 50% of all food produced, engineers need to act now and promote sustainable ways to reduce waste from the farm to the supermarket and to the consumer. There are many useful steps can be taken to overcome the problem of food waste problem in India. India require to understand the approaches of the developed world on overcoming the problems. For example: In France, it is mandatory for supermarkets to donate unsold food items to charity or farmers to convert them into fertilizers

Canada recovers unused food items from manufacturers, retailers, restaurants, etc. and delivers these food ingredients to be used to cook over 22,000 meals every day. Sweden implemented a recycling revolution, wherein less than 1% of household waste ends up in landfills and of the 4.4 million tons of household waste produced every year, 2.2 million is converted into energy. Though we know only the government can take major actions to prevent food wastage in India, we, on a personal level, can act more proactively to minimize it. Or do we need another abhyanga to remind ourselves the basic things we should be taking care of?

On summing up food waste is both economic and social issue have certain consequences; in the economic realm it costs a lot in a society where huge number of people are hungry; while on the other hand it is not desirable for the sustainable environmental development. Studies have been carried out to figure out the problems of the developed countries; there are plethora of researches are being carried out to solve the problems; but there is no abundance of studies to eradicate the problem. Researches should be carried out to

bring forth appropriate technology use to maximum utilization of the resources.

## Bibliography

- Bryce, E. (2013, January 25). *The Conundrum of Food Waste*. Retrieved from Green The Conundrum of Food Waste Comments:  
<https://green.blogs.nytimes.com/2013/01/25/the-conundrum-of-food-waste/>
- Chauhan, D. (Sep 16, 2016). *These Shocking Stats Show How India Wastes More Than ₹92,000 Crore Every Year Without Batting An Eye*. Retrieved from  
<https://www.scoopwhoop.com/The-Problem-Of-Food-Wastage-In-India/>
- Fox, D. T. (2013). Improving the world through engineering. The Institution of Mechanical Engineers .
- Goodwin, N., Nelson, J. A., Ackerman, F., & Weisskopf, T. (2008). *Consumption and the Consumer Society*. Medford: Global Development And Environment Institute , Tufts University.
- Grigg, D. (1999). The Changing Geography of World Food Consumption in the Second Half of the Twentieth Century. *The Geographical Journal, Vol. 165, No. 1* , 1-11.
- Grolleaud, M. (2002). *Post-harvest losses: discovering the full story. Overview of the phenomenon of losses during the post-harvest system*. Retrieved from Agro Industries and Post-Harvest Management Service.:  
<http://agris.fao.org/agris->

search/search.do?recordID=XF201605  
5548

Lundqvist J., d. F. (2008). *Saving water: from field to fork—curbing losses and wastage in the food chain.* . SIWI Policy Brief. Stockholm, Sweden: SIWI. Google Scholar.

Parfitt, J., Barthel, M., & Macnaughton, S. (27 September 2010). Food waste within food supply chains: quantification and potential for change for 2050. *Philosophical Transactions: Biological Sciences, Vol. 365, No. 1554, Food security: feeding the world in 2050*, 3065-3081.

Parya, S. (2014, December). Towards Understanding the Retail Sector in India. *Society Today*, pp. 54-58.

UN. (2002). *Commodity Trade Data Base.* New York,. Retrieved from NY: United Nations Statistical Division. : <http://comtrade.un.org/db/default.aspx>.

UN. (2008). *World Urbanization Prospects. The 2007 Revision Population Database.* Retrieved from <http://esa.un.org/unup/>

UN, R. (2013, September 11 ). *UN report: one-third of world's food wasted annually, at great economic, environmental cost.* Retrieved from <https://news.un.org/en/story/2013/09/448652>