

Responsible Consumption for Curbing Food Wastage: An Exploratory Enquiry

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Abstract

The world population crossed seven billion during year 2011 and is expected to touch the mark of 9.3 billion by the year 2050. This increase in number of people all over the world will invariably lead to an increase in demand of food at a humongous scale. In a report prepared for the Global Food Security Programme, Bond et al. (2013) pointed that against the whopping 50-70% inflation projected in food demand, around 868 million people are struggling with under nourishment all over the globe whereas approx. one third of global food production ends up as waste. As a developing nation still battling the devils of poverty, corruption and skewed income distribution, India has not been able to solve or manage the conundrum of food wastage over the years and each year witnesses tons of food going to garbage at various stages of production, supply and consumption. However, it is crucial to investigate and assess the causes and impact of food wastage in order to take steps towards reducing losses and wastage in the entire food production and consumption system. This paper endeavors to uncover the causes and cases of food wastage in Indian households and commercial enterprises. It also underlines the various stages of food production and delivery that contribute to wastage of food in various ways. The paper concludes with taking an account of various causes leading to food wastage in Indian scenario and suggestions on strategies to reduce the scale of food wastage India.

Keywords: *Food wastage, consumption in households, causes of food wastage, India*

Introduction

Recent past has witnessed a growing interest in the problem of food wastage and the unfavourable outcomes it brings in at several international platforms. These outcomes include significant financial loss, hazardous impact on the environment and scarcity of food resulting into a chain of ill effects like inflated prices leading to affordability and accessibility issues for poorer

sections of the society and an incremental growth of malnutrition in these segments. The emergence of information about social, environmental and economic consequences of food wastage has propelled the need for further research and brought it into the focus of researchers, policy makers and public administrators alike.

'The State of Food Security and Nutrition in the world, 2017' report of Food and Agriculture

organization (FAO), UN claimed that 190.7 million people in India are malnourished which indicates towards the gravity of situation at present. Aschemann-Witzel et al. (2015) compared wastage of food with an “inefficiency” that is hardly affordable for the human population. Unfortunately, the entire supply chain of food in India is crippled with the problem of food losses largely owed to mismanagement in a progressive fashion. This negligence is taking place at each stage of food system such as harvesting, transporting, processing, packaging and consuming leading to a loss or wastage of around 40% of the total food production as estimated by the aforementioned report. Stefan et al. (2013) pointed towards the gap in understanding of problem at hand by asserting that despite consumers being the chief contributors to food wastage, the factors leading to it in the households are largely left alone. Bolton and Alba (2012) posited that people's ethical intentions of not wasting the food do not convert into action. Radzymińska et al. (2016) opined that consumers in developed countries act as one of the most prominent source of food wastage and thus, a thorough understanding of factors leading to waste related consumer perceptions and actions is called for.

Being recognized as an environmental and ethical issue globally, wastage of food warrants a close investigation into the causes and consequences under various contexts of relevance. Moreover, the social dimensions of this phenomenon attach additional importance to the investigations aimed at taking the world towards a definite solution. A sound knowledge about the factors that lead to the wastage of food is crucial to the design of effective interventions. Present study is an attempt to delineate the concept of food wastage by undertaking a comprehensive review of pertinent literature. It further investigates the drivers of food wastage that contribute to the growth in amount of

food wasted at various stages of food production and supply with an intent to underline a path to reducing and removing various environmental, ethical and social ill effects upon the quality of life around. The implications are discussed for identifying the areas that need to be worked upon in this regard.

Food Wastage

Food satisfies the basic need of all beings and it is essential for living. Perceived differently by dissimilar people under diverse contexts, food can be considered as medicine, health essential or it may have symbolic meaning as per context (Strauss, 1963; Lupton, 1996). Food consumption behaviour carries numerous cultural, communal, psychological and symbolic meanings. Our eating behaviour and way of consuming food makes an impact on life and environment while affecting the economy and society as a whole (Morgan, 2009; WRAP, 2009; Von Braun, 2007; Stuart, 2009). Consumption beyond requirements brings in severe consequences and “the colossal wastage of food in elite trains like Rajdhani and Shatabdi would tell the story of the magnitude of wastage and the attitude of people towards resources of society” (Pathak, 2017). Wastage of every food item that was intended to fulfil a human need causes an environmental footprint and generates a social concern in the face of widespread hunger and malnutrition as the resource that went wasted could have been put to a better usage (Aschemann-Witzel et al., 2015). This waste entails colossal consequences (Neff et al., 2015) as the food wasted thus results in not only financial losses but also causes losses in terms of natural resources, food shortage in developing countries and greenhouse gases (Stuart, 2009). According to reports, developing countries faced food wastage problem due to inadequate infrastructure for production and trade while in developed countries, retailer-consumer interaction led to food wastage (Parfitt et

al., 2010).

We use and dispose food on daily basis and thus wastage of food has become an issue of crucial importance. Food wastage happens at several levels of supply chain of food such as agriculture, food processing and warehousing, wholesale and retail distribution, food service and households. A considerable share of such waste takes place at the consumer level and is attributed to consumer behaviour and wide ranging socio-economic factors along with practices followed at the stages of processing and retailing (Evans, 2011; Quested et al., 2013). Previous studies highlighted the huge role of consumers in determining total size of food wastage (Griffin et al., 2009) which is far greater than the waste generated during food harvesting, processing and distribution (Neff et al., 2015). Food retailers play a key role in food wastage as well as prevention of wastage (Aschemann-Witzel et al., 2015). Studying consumers' perception about behaviour related to food waste would be useful as consumers do not recognize the repercussions of food waste on environment (Stefan et al., 2013). Moreover, improved models integrating "attitudinal motivation, skills (perceived behavioural control) and food-related behaviours prior to disposal of food, as well as, possible additional mediators of the relationships between food waste and consumer attitudes, norms and perceived behavioural control, for instance resource-related factors" should be proposed and

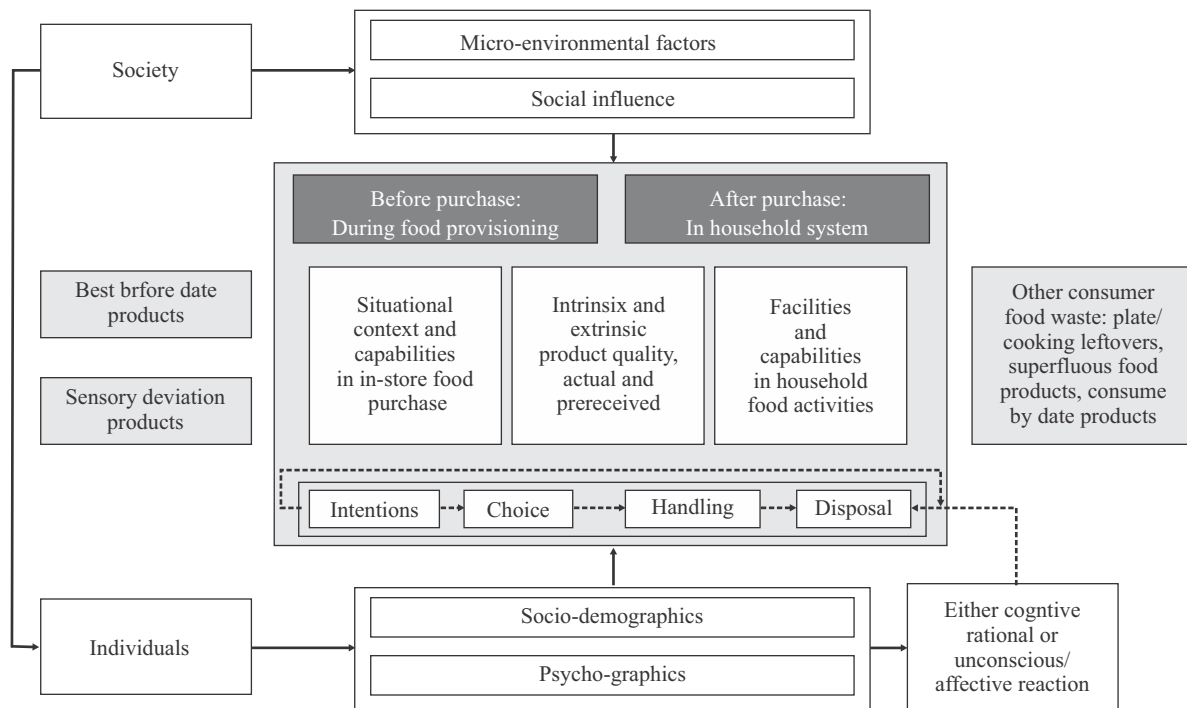
tested under cultures that have been focusing upon the problem of food wastage in recent times (Stefan et al., 2013).

Causes of Food Wastage

In their study that took place in Finland, Koivupuro et al. (2012) acknowledged gender, household composition, packaging and views about value in terms of money direct quantity of wasted food. Williams et al. (2012) acknowledged following as drivers of food wastage:

- a) Bought too much
- b) Too large package
- c) Difficult to empty completely
- d) Bought the wrong thing
- e) Accident
- f) Passed best before date
- g) Bad/broken package
- h) Food has gone bad (rotten, sour, mouldy, etc.)

EU project Fusions (2015) identified 300 causes of food waste and classified them into broad categories of consumer related causes of food wastage i.e., social factors (household type, family stage and related lifestyles), individual factors (individual behaviours, perceptions of and expectations from food, lack of awareness and knowledge, etc.) Parfitt et al. (2010) hold size and composition of household, income, demographics and culture responsible for food wastage at household level.

Fig.1: Model of the factors of influence on consumer-related food waste

Source: Aschemann-Witzel et al. (2015)

Characteristics & Consumption Patterns of Household

A research by WRAP (2008) underlined causes of food waste in Britain and suggested that households contribute to wastage in the form of leftovers and inedible food due to damage during preparation. It also stressed upon the role of timely consumption as many times, food and beverages have to be dispose-off because they lose their suitability for consumption due to expiry or deterioration. Discussing the perceptions of households about food wastage, WRAP (2007) stated that households consider leftovers and food deliberately thrown away as food waste and food found unfit for consumption is not counted as wastage as such.

Parfitt et al. (2010) argued that size and composition of family also affect the amount of food wastage in the household as it has been

observed that more wastage takes place in case of adults than children and smaller families are found to be wasting more food per person than larger families. WRAP (2009) registered that bigger households produce lower per capita food waste in comparison to smaller ones in the developed countries. WRAP (2008) determined that per person food waste is higher in single households.

Several researchers such as Koivupuro et al. (2012), Ventour (2008) and Quedsted and Johnson (2009) found that size of a household has a strong relation with volume of wastage there and suggested that households with lesser number of members waste lesser food than those with greater number of people. However, food wastage per person comes down gradually as the size of household increases.

Stefan et al. (2013) opined that higher income results in higher amount of food wastage in

households. Lyndhurst (2007) opined that families with lower income generate lesser food wastage and thus, family income seems to have an impact on food waste in households. Parfitt et al. (2010) on the other hand stressed that a complete absence of any correlation between income and food wastage has been reported in some part of literature. Wenlock et al. (1977) failed to find any statistical significance of the causal relationship between income and food waste. Several years later, WRAP (2007) explained that people with lower income have lesser inclination towards purchase planning and are more likely to live in present. Wassermann and Schneider (2005) found that people in regular jobs wasted more food. This may have been observed due to relationships among education, type of employment and earning capabilities as Wassermann and Schneider (2005) noted that people with higher education are more likely to throw away food.

Quested et al. (2013) indicated towards the generational differences in food waste behaviours. They opined that witnessing scarcity during or after the Second World War led to consumers from that era waste minimal amount of food. These generational differences also underscore the role and impact of historical developments on present day food wastage behaviour of the society in general. Priefer et al. (2016) promoted following as the prominent sources of food wastage in households:

Fig. 2.Sources of waste at households

- Lack of planning/Knowledge concerning food purchase and storage.
- Impulse purchase (buying items that are not currently needed).
- Purchasing of new products that the consumer then 'do not like'.
- Inadequate package sizes (e.g. oversized ready to eat meals).

- Poor Storage management (e.g. inadequate wrapping).
- Confusion about date labels ('best before', 'use by').
- Lack of skills for food preparation.
- Poor experience in planning meals.
- Preparing oversized meals.
- Lack of skills for recombining leftovers into new meals.

(Source: Priefer et al., 2016)

Characteristics & Consumption Patterns of Individual Consumers

Muth (2007) indicated that season and gender have a role to play in this regard as summer brings more instances of food wastage than any other season of the year and women are found to be wasting more food than men. Wenlock et al. (1980) advised that adults produce waste more food than children. However, WRAP (2008) asserted that households with members under the age of sixteen are biggest generators of food waste Hamilton (2005) and Lyndhurst (2007) emphasized that presence of children in a household affects its volume of wastage as youth wastes more than their older counterparts. Wassermann and Schneider (2005) posited that people aged over fifty years are found to be wasting lesser food and more involved in saving and recycling due to more indoor time and financial constraints. WRAP (2008) argued that self-employed people are most likely and retired veterans are least likely to waste food among different occupation groups that is again a reflection upon influence of age on waste behaviours. Stancu et al. (2016) affirmed that lower volume of food waste is linked with old age consumers. Aschemann-Witzel et al. (2015) indicated that conflicting goals have the potential to affect consumption behaviour with regard to food waste and helps in describing the non-alignment of attitudes, intentions and behaviour.

Kummu et al. (2012) in a study of British consumers, pointed that revolutionizing lifestyles promote higher wastage as switching to healthy diet involves buying and consuming highly perishable items such as fresh fruits and vegetables.

Generation Driven Differences

A study conducted by national supermarket in the UK found that millennials are wasting more food than baby boomer and major reason behind this is the disconnect with the knowledge of food chain and lifestyle change. It has also been observed that millennial are also inclined to use more exotic foods which are difficult to reuse. In the view of the research it has also been observed that Australia is witnessing the same trend. On the contrary in UK few millennials are also there who are working as a catalyst to the campaigns to save food though with a slow pace. Similarly due to the availability of wide variety in terms of food choices, wastage has become quite evident. It also happens due to disconnect with the value chain of the food. Furthermore, RaboDirect (2016) study reveals that in Australia huge amount upto the extent of \$10 billion are wasted as food waste and a direct correlation between food waste and a lack of understanding about agriculture and food production was found with Gen Y specially identified for this correlation. In contrast with above observation Statistics seem to indicate that millennials are more eco-friendly than other generations. Social upbringing is also responsible in inculcating a habit of not wasting food. But it kept on changing with time. Much conservative approach was there earlier but later on things changed drastically and this resulted in food wastage. Best part is millennials have also started working in this direction. To come out of this millennial have started purchasing things from the farmers market so that they can purchase more judiciously. Moreover they also have started

Preservation techniques such as curing, pickling, and fermenting in making a comeback beyond the homemade beer and wine trends. Additionally every generation think that eat out more and they waste more food and the actual waste is happening only due the eating out too much Morrison (2016).

Culture & Ethnicity

Parfitt et al. (2010) noted that Hispanic households of USA threw lesser food away than non-Hispanic ones. Rathje and Murphy (2001) insisted that such trend can be attributed to cooking styles as well since Hispanic cuisine is constituted of various mixed dishes that use leftovers as ingredients.

Consumption Planning & Patterns

Jastran et al. (2009) argued that routines offer comfort and certainty to the consumers. Stefan et al. (2013) emphasized that there is a direct relationship between food waste related behaviours of consumers and their planning and shopping routines. Evans (2012) and Thomas and Garland (2004) stated that one of the routine and regular household practices is food provisioning. Some studies like Evans (2012) and Buurman and Velghe (2014) confirmed that consumers accepted buying more food than required on a routine basis.

Packaging & Selling Strategies

Svanes et al. (2010) and Wikström and Williams (2010) argued that due to excessive focus on the negative impact of packaging on environment, the potential role of packaging in reducing food waste has mostly been ignored. Williams et al. (2008) reviewed the previous studies which suggested that effective packaging development has a great role to play in reducing food related losses. Sonesson et al. (2005) asserted that since the gravity of environmental impact of packaging related food waste is largely unknown, it is difficult to certain

the extent to which packaging can help in reducing food waste.

Underlining the role of supermarkets in people's shopping patterns, Blanke (2015) pointed that supermarkets employ multiple methods such as volume discounts, store layout, packaging, etc. to encourage consumption. Buurman and Velghe (2014) argued that the deliberate strategies of supermarkets aimed at encouraging more purchase to achieve greater profits affect household food waste behaviour. They further opined that consumers buying more than what they need due to temptations from supermarkets acts as a reason for increased food wastage in households.

Knowledge & Awareness

Farr-Wharton et al. (2014) maintained that lack of clarity about the stocks, suitability of food for consumption and purchase or context specific situational factors contribute to wastage of food. EC's "preparatory study on food waste" (2010) reviewed literature and facts about food thrown away and established that absence of awareness and attitudes can be seen as consumer-level reasons of food wastage.

Food Labeling

WRAP (2008) in its report suggested that language used on the labels has a great deal of potential to cause confusion regarding evaluation of food quality and safety. Segrè and Gaiani (2011) pointed that such misunderstanding leads to increased number of unsold merchandise ultimately resulting into wastage of food otherwise fit for human consumption. European Commission (2010) observed that sensitivity to food hygiene leads to sometimes unreasonable apprehensions about its edibility around the "best before" dates. This is often caused due to confusion in understanding the labelled information about 'use by' and 'best

before'.

Other Factors

Kummu et al. (2012) pointed that in several households, there is no awareness about importance of keeping the refrigerators at right temperature. This may also cause food stored in refrigerators go stale and unhealthy for consumption leading to obvious wastage. Another important driver of food wastage in households is the influence of children on shopping and cooking. Kummu et al. (2012) posited that children accompanying the adults for shopping often results in excessive purchasing. Also, children's taste related tantrums force the parents to cook separate dishes for them that again push food wastage.

Food Wastage in India: Causes & Consequences

Sriraj (2016) acknowledged that food wastage is a global issue as he referred to a report by the National Resources Defence Council (NRDC). The report suggested that in US, around 40 per cent of the food goes into dustbin and Asian countries like India and China face 1.3 billion tonnes of food wastage each year. The report also noted that India holds seventh position in overall wastage of poultry, agricultural produce and milk. Singh (2015) stated that "An RTI query in 2010 brought to light how within ten years during 1997 and 2007 itself, 1.83 LT of wheat, 6.33 LT of rice and 2.20 LT of paddy was wasted. Thereafter, as per rough estimates, situation has not improved" and called such humongous wastage of food grain "appalling" due to India's dismal performance in Global Hunger Index (GHI). He referred to a RTI query of year 2010 in his article on absence of logistics & supply chain management causing losses and pointed that during 1997–2007, 1.83 LT of wheat, 6.33 LT of rice and 2.20 LT of paddy went spoiled. Citing a report on Global Hunger Index

2015 ranking India 67th in hunger, Kumar (2015) wrote that it is paradoxical that there are numerous reasons of Indians wasting food and at the same time 213 million children in India battle hunger as per the report. He further discussed the causes of food wastage such as problems related to poor infrastructure, roads, insufficient number of cold storage, connectivity of ports, railways, poor food management at functions such as marriage, conferences, etc. He mentioned that Saumita Chaudhary committee in the year 2012 estimated India's cold storage requirements at 61.3 million tonnes in comparison to the then available 29 million tonnes. The committee highlighted the central government's efforts in terms of providing "grant-in-aid for states to build cold chain infrastructure which is 50% of the total cost of the plant and machinery in general, areas and 75 % in difficult areas including the Northeast India." Sriraj (2016) referred to the findings of a study conducted by Indian Institute of Management Calcutta and noted that cold storage facility is available for only 10% of food in India. He posited that such shortage of cold storage facility coupled with inadequate supply chain management amounts to a great reason of food wastage in India both before and after harvesting of cereals, pulses, fruits and vegetables. Other than these, changes in social norms of consumption have also left a great impact on the problem of food wastage. Most of the social events witness an outrageous amount of food left in the plates or trash cans. Serving numerous varieties has become one of the symbols of one's social standing and affluence. Given the inclination towards organizing such lavish and

large scale arrangements, there is an alarming absence of a system for food management. What is disturbing about it is the increasing approval of such behaviour among the social circles across the classes and masses.

In an article on 'Curbing food wastage in a hungry world', Bordoloi (2016) stressed that loss and wastage in the areas of agriculture and food call for adapting to the changes in climate and such loss or wastage of food is responsible for approx. 8% of total global greenhouse gas emissions. Kumar (2015) suggested that wastage of food in India takes place at both pre-harvest and post-harvest levels and "Wastage of fruits and vegetables are 70% of the total produce and it cost only 40% of economic losses." Bordoloi (2016) considered fulfilling the food related needs of increasing population in India while decreasing the loss and wastage of food a major challenge. Sriraj (2016) argued that the wastage of input resources such as water and oil is unavoidable due to problem of food wastage. He also stated that "approximately 45 per cent of India's land is degraded primarily due to deforestation, unsustainable agricultural practices, and excessive groundwater extraction to meet the food demand." Underlining the wastage of water inherent in wastage of food, Bordoloi (2016) pointed that wasting just a kilogram of wheat and rice would result in wastage of 1500 and 3500 litres of water used in their production respectively. The dire consequences of food wastage can also be experienced in terms of aggravated levels of water scarcity in India which clearly indicates that natural resources are under attack too.

Table1. Causes & Consequences of Food Wastage in India

S. No.	Causes of Food Wastage in India	Consequences of Food Wastage in India
	Poor infrastructure in terms of roads, insufficient number of cold storage, connectivity of ports, railways, etc.	Global greenhouse gas emissions
	Inefficient food management at functions such as marriage, conferences, etc.	Aggravated levels of poverty and mal nutrition in the country
	Acceptance of over consumption as a social norm	Wastage of valuable input resources such as water and oil
	Availability of excessive number of varieties or options for consumption of a commodity	Adverse effects on natural resources

Discussion & Suggestions

The mammoth scale and intricacy involved in the issue of food wastage is too difficult to be handled by a single institution or country. Noticeably, several initiatives have been launched to solve the problem of food wastage globally. For an instance, some organizations in Canada have made it possible to deliver ingredients for 22000 meals per day to the charities by collecting reusable food items from retailers, manufacturers, restaurants and caterers. However, there is an obvious lack of coordinated and collaborated efforts resulting into ineffective programs. The areas that need to be worked upon in order to curb the problem of food wastage in India are:

1. Developing a robust system of storage and distribution

In a bid to offer solutions for the problem of food wastage, Kumar (2015) advised that there is an urgent need for developing cold storages and boosting connectivity in terms of railway, road or highways in order to make fruits and vegetables available for consumption at remote Indian locations. Also, the supply chain management system requires world class upgrade of back-end to front-end procure with respect to major

agricultural products such as sugarcane, vegetables, fruits etc. He further suggested that government's policies related to procurement from farmers, storage, taxation, etc. need to be considerate and liberal whereas household wastage during day to day routine as well as functions should be minimized using modern technologies.

India's food wastage is comparable to the cost of hundreds of cold storages and warehouses that can be constructed with the money wasted in spoiled food. There is a need to put stringent measures for storage and distribution in place at panachayat level itself in order to reduce the amount of wasted food grains and others items.

2. Household management

Planned purchasing and consumption in households can create an effective impact over the amount of food wastage at household level. Learning and practicing the ways to increase the shelf life of food items, retain the freshness of food, keep them dry, cooking in adequate measures, need based purchasing at regular intervals etc. are important to curb the problem of food going rotten and inedible. Moreover, serving as per the need of diner should replace the common practice of overloading the plates of guests with food as a

gesture of affection or hospitality and throwing food away needs to be strongly discouraged. Labelling the unused food before storing them for future consumption may also help in decision making with respect to buying, cooking and consuming.

3. Proactive policy related measures

A wide social change that requires modification in both attitudes and behaviour at community level cannot find success unless it is backed by effective government policy driven initiatives and programmes. Since a significant part of wastage of food in India takes place at the level of consumption, policy makers need to shift their attention to consumer antecedents of food wastage and draft rules to encourage responsible consumption. This calls for changes in public's perception, attitude and behaviour with regard to consumption as well as disposal of food that is available to them. Organization of educational campaigns and awareness programmes intended to enlighten the public about causes and prevention of food wastage in homes, offices and events needs to be accelerated throughout the country. Also, a multi-faceted social movement with a unified goal of curbing the problem of food wastage should be launched where programmes focused on developing and encouraging good habits among children, redistribution of unconsumed food among needy, bringing change in ideas of appropriate quantity and quality of food, regulation of responsible consumer behaviour are designed and implemented at household and retail levels.

4. Sustainable corporate practices

It is about time for corporate social responsibility to start addressing the impact of profit driven business practices on nationwide phenomena of over consumption, wastage and unhealthy materialism. Corporate should step forward to

undertake social audits and evaluate their environmental and social footprints. Food wasted while moving through the supply chain or at the retailers' outlets is a cause for concern and should be taken as such by the business houses as well. The players of food chains need to treat elimination of wastage as a crucial component of their CSR practices and look into the ways to redefine proper means of profitability.

5. Environment friendly consumer preferences

The biggest protagonist of food wastage in India is individual consumer that not only affects the problem through his personal habits and behavioural norms but also contribute to it at a larger scale by exerting an influence over business practices and government policies through his preferences and attitudes. The consumers need to realize their magnitude of their impact over patterns and practices prevailing in the society at large and move towards embracing the concept of ethical consumption in all possible aspects of life. Some of the immediate steps as suggested by EU are planned buying, awareness about consumption dates, consideration for budgetary constraints, healthy refrigeration and storage, serving small portions, reuse of leftovers and compost production.

Conclusion & Direction for Future Research

The causes of food wastage underlined in the above sections are heralds of an imminent danger of scarcity that the mankind faces. Fortunately, these causes also highlight the potent solutions that may create a positive impact on the problem stricken areas. Bringing changes, however, seems difficult in the light of several other personal and economic objectives and trade-offs related to food buying and eating. The problem of food wastage is yet to be taken cognizance of at the household levels and it continues to hold a low priority status in the

books of business houses and policymakers as well. A basket of integrated and collaborated efforts in this direction are called for where actionable solutions and directions for improvements are identified along with building motivation and involvement among the major players is accomplished. Future studies may explore the possibilities of comparative analysis of food waste causes in developed and developing countries and design customized solutions in the light of economic and social disparities. There is also a call for developing a sound measure of perceptions and attitudes towards food wastage among consumers at individual and household levels. Further research on food wastage can undertake the task of investigating into the relationships of food waste behaviour with value systems, regulatory restrictions, social norms, etc.

References

- Aschemann-Witzel, J., de Hooge, I., Amani, P., Bech-Larsen, T., and Oostindjer, M. (2015). Consumer-Related Food Waste: Causes and Potential for Action, *Sustainability* 2015, 7(6), 6457-6477.
- Blanke, M. (2015). Challenges of reducing fresh produce Waste in Europe- farm to fork. *Agriculture* 2015, 5, 389-399.
- Bolton, L.E., & Alba, J.W. (2012). When less is more: consumer aversion to unused utility. *Journal of Consumer Psychology*, 22(3), 369-383.
- Bond, M., Meacham, T., Bhunnoo, R. and Benton, T.G. (2013). *Food waste within global food systems*. Global Food Security Programme, Swindon.
- Bordoloi, B. (2016). *Curbing food wastage in a hungry world*. BusinessLine, October
- Buurman, R., and Velghe, J. (2014). *Supermarkten en voedselverspilling*. Retrieved from: <http://docplayer.nl/13050898-Supermarkten-en-voedselverspilling.html> (Accessed on 22 March 2016).
- Cox, J., and Downing, P. (2007). *Food behaviour consumer research: Quantitative Phase*. WRAP: Banbury, UK.
- European Commission (2010). Preparatory study on food waste across EU 27. *Technical Report - 2010-054*, DG ENV - Directorate C.
- Evans, D. (2011). Blaming the consumer – once again: the social and material contexts of everyday food waste practices in some English households. *Critical Public Health*, 21(4), 429-440.
- Evans, D. (2012). Beyond the throwaway society: Ordinary domestic practice and a sociological approach to household food waste. *Sociology*, 46 (1), 41-56.
- Farr-Wharton, G., Choi, J. H. and Foth, M. (2014). Identifying Factors that Promote Consumer Behaviours Causing Expired Domestic Food Waste. *Journal of Consumer Behaviour*, 13(6), 393-402.
- Fusions (2015). *EU FP 7 funded project*. Available on <http://www.eu-fusions.org/index.php>.
- Griffin, M., Sobal, J. & Lyson, T. A. (2009): An analysis of a community food waste stream. *Agriculture and Human Values*, 26(1-2), 67-81.
- Hamilton, C., Denniss R., and Baker, D. (2005). Wasteful consumption in Australia. *Discussion paper 77*, The Australia Institute.
- Jastran, M.M., Bisogni, C.A., Sobal, J., Blake, C., Devine, C.M. (2009). Eating routines: Embedded, value based, modifiable, and reflective. *Appetite*, 52 (1), 127-136.
- Koivupuro, H., Hartikainen, H., Katajajuuri, J.-M., Silvennoinen, K., Heikintalo, N., Reinikainen, A. and Jalkanen, L. (2012). Influence of socio-demographical, behavioural and attitudinal factors on the amount of avoidable food waste generated in Finnish households. *International Journal of Consumer Studies*, 36(2), 183-191.
- Kumar, D. (2015). Problem of Food Wastage in India- Magnitude, Causes and Remedies. *Wordpress*, June.
- Kummu, M., de Moel, H., Porkka, M., Siebert, S., Varis, O., and Ward, P.J. (2012). Lost Food, wasted resources: global food supply chain losses and their impacts on freshwater, cropland, and fertilizer use. *Science of the total environment*, 438, 477-489.
- Lupton, D. (1996). *Food, the Body and the Self*. London: Sage Publication.

- Lyndhurst, B. (2007). Food behaviour consumer research: quantitative phase. *Briefing paper*, WRAP: UK
- Morgan, E. (2009). *Fruit and vegetable consumption and waste in Australia*. Victoria, Australia: State Government of Victoria, Victorian Health Promotion Foundation.
- Morrison, L. (2016). *How Each Generation Wastes Its Money, From Millennials To Baby Boomers*. Retrieved from: <https://www.bustle.com/articles/164201-how-each-generation-wastes-its-money-from-millennials-to-baby-boomers>.
- Muth M. K., Kosa, K.M., and Karns, S.A. (2007). *Explanatory research on estimation of consumer level food conversion factors*. RTI International.
- Neff, R.A., Spiker, M.L., and Truant, P.L. (2015). Wasted Food: US consumers' reported awareness, attitudes, and behaviors. *PLoS ONE*, 10(6).
- Parfitt, J., Barthel, M., and Macnaughton, S. (2010). Food waste within food supply chains: quantification and potential for change to 2050. *Philosophical Transactions of the Royal Society of Biological Sciences*, 365(1554), 3065-3081.
- Pathak, P. (2017). On unethical consumption. *Pioneer*, 6th August.
- Priefer, C., Jorissen, J., and Brautigam, K-R. (2016). Food waste prevention in Europe- A cause-driven approach to identify the most relevant leverage points for action. *Resources conservation and recycling*, 109, 155-165.
- Quested, T., and Johnson, H. (2009). *Household food and drink waste in the UK*. UK: WRAP.
- Quested, T., E., Parry, A.D., Eastal, S., and Swannell, R. (2013). Food and drink waste from households in the UK. *Nutrition Bulletin*, British Nutrition Foundation.
- RaboDirect (2016). RaboDirect Financial Health Barometer 2016. *Food and Farming Report*.
- Radzymińska, M., Jakubowska, D., and Staniewska, K. (2016). Consumer attitude and behaviour towards food waste. *Journal of Agribusiness and Rural Development*, 39, 175-181.
- Rathje, W.L., and Murphy, C. (2001). *Rubbish!: The Archaeology of Garbage*. University of Arizona Press,
- Segrè, A. and S. Gaiani (2011). *Transforming Food Waste into a Resource*. Royal Society of Chemistry Publishing.
- Singh, P.K. (2015). What is the cause of huge food grain wastage in India?. *Business Standard*, August 14.
- Sonesson, U., Antesson, F., Davis, J., and Sjöden, P. (2005). Home transports and wastage: Environmentally relevant households activities in the life cycle of food. *Ambio*, 34(4-5), 371-375.
- Sriraj, K. (2016). Tackling Food Wastage in India. *The Pioneer*, June 30.
- Stancu, V., Haugaard, P., and Lahteenmaki, L. (2016). Determinant of consumer food waste behaviour: Two routes to food waste. *Appetite*, 96, 7-17.
- Stefan V., Van Herpen E., Tudoran A.A., Lähteenmäki L. (2013). Avoiding food waste by Romanian consumers: The importance of planning and shopping routines. *Food Quality and Preference*, 28(1), 375-381.
- Strauss, L., C. (1963). *Totemism*. Boston, MA: Beacon Press.
- Stuart, T. (2009). *Waste, uncovering the global food scandal*. London, UK: Penguin.
- Svanes, E., Vold, M., Møller, H., Kvalvåg Pettersen, M., Larsen, H., and Jørgen Hanssen, O. (2010). Sustainable packaging design: a holistic methodology for packaging design. *Packaging Technology and Science*, 23(3), 161-175.
- Thomas, A., and Garland, R. (2004). Grocery shopping: list and non-list usage. *Market intelligence & planning*, 22 (6), 623-635.
- Ventour, L. (2008). *The food we waste*. Banbury: WRAP.
- Von Braun, J. (2007). The World Food Situation. *Food Policy Report 18*, Washington DC.
- Wassermann, G., and Schneider, F. (2005). Edibles in Household Waste. *Proceedings of the Tenth International Waste Management and Landfill Symposium*, CISA, S. Margherita di Pula, Sardinia.
- Wenlock, R. W., Buss, D. H., Derry B. J., and Dixon, E.J.

- (1979). Household food wastage in Britain. *British Journal of Nutrition*, 43(1), 53-70.
- Wenlock, R. W., and Buss, D.H. (1977). Wastage of edible food in the home: A preliminary study. *Journal of Human Nutrition*, 31(6), 405-411.
- Wikström, F., and Williams, H. (2010). Potential environmental gains from reducing food losses through development of new packaging - a life-cycle model. *Packaging Technology and Science*, 23, 403-411.
- Williams, H., Wikström, F., and Löfgren, M. (2008). A life cycle perspective on environmental effects of customer focused packaging development. *Journal of Cleaner Production*, 16(7), 853-859.
- Williams, H., Wikstrom, F., Otterbring, T., Lofgren, M., and Gustafsson, A. (2012). Reasons for household food waste with special attention to packaging. *Journal of Cleaner Production*, 24, 141-148.
- WRAP (2008). *Research into Consumer Behaviour in relation to food dates and portion sizes*. Banbury: WRAP, October.
- WRAP (2010). *A review of waste arisings in the supply of food and drink to UK households*. Banbury:WRAP.
- WRAP (2009). *Household Food and Drink Waste in the UK*. Banbury:WRAP.
- WRAP (2007). *We don't waste food! A householder survey*. Banbury:WRAP.