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Review Article

Locavorism to Enhance the Environmental, Social & Economic Well Being

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Abstract

To enhance the environmental, social, and economic well being of a society, specifically an agrarian society like India, it becomes imperative that the entire chain of food production, processing, distribution, and consumption are integrated. Locavorism, as a movement and a practice emphasizes on buying and consumption of food that are grown within a relatively short distance from one's location. The word 'local' refers to buying products which are available in closer proximity. People who prefer to eat locally grown food are referred to as localvores or locavores.

A locavore are those who would prefer to consume food that is produced locally, within a limited radius of around 50-100 miles. This is an effort to build locally strong, self reliant and self sustaining food economies. These sustainability measures that attempted exploring the impact of the food items on the dinner table, led to the emergence of another concept i.e. food miles (which refers to the distance that food travels from place of production to the point of consumption). Food mile is often associated with the locavore movements, since it emphasizes on consumption of locally grown food or otherwise reducing the distance travelled by food.

Locally produced food is mostly fresh, goes through less processing procedures and uses less preservatives, comparatively. While there are both advantages, and disadvantages with being a locavore, the key limitation of food miles is that it indicates only the distance traveled, not the processes involved in the value chain. Decrease in cultivable land area at an alarming rate due to urbanization, and with a huge challenge ahead to feed the population (80% of the world's population is expected to reside in urban areas by 2050) in a sustainable way.

Various programmes and techniques pertaining to urban farming are gaining momentum, thereby utilizing the so-called developed urban areas for sustainable agricultural production.

Keywords: Locavores; Locavorism; Food miles; Slow food movement.

Introduction

"An ideal agricultural system is sustainable, maintains and improves human health, benefits producers and consumers both economically, and spiritually, protects the environment, and produces enough food for an increasing world population." *Dr. Teruo Higa.*

"Food is a substance which consists of nutrition in order to support an organism in helping them maintain a good state of physical, mental and social well being". Effective management/balance of

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food intake and nutrition are keys to good health /the prevention of diseases. The sources of food are the plants and animals. Some foods are directly taken from plants, whereas some are obtained from various edible fungi, particularly mushrooms.

Fungi and the ambient bacteria are those which are used in the preparation of fermented foods like alcoholic drinks, pickles, bread, cheese, etc (Scott, & Sullivan, 2008). Plants serve as the sources of food ingredients like fruits, vegetables, cereals, and grains, whereas animals provide with eggs, meat/ meat products, and milk.

While there are several factors in the choice of food, emotional and cultural factors are of exceptional importance in determining food intake.

Appetite may prove adequate for selection of a nutritionally acceptable diet under certain circumstances. Some of the other factors which also influence the intake of food include:

- *Biological determinants:* Such as hunger and taste, some of the economic determinants like income, availability, or cost.
- *Physical determinants:* Such education, time, access, and skill (like cooking)
- *Social determinants:* Such as meal patterns, family and peers, and/or the culture
- *Psychological determinants*: Such as stress, happiness, guilt.

The global population has increased fourfold over the last century; there are 7.7 billion people, and it is estimated by the UN (2019-20) that we may reach 9.7 billion by 2050. With this growth, alongside the rising incomes in the developing countries increase the demand for food (like it causes dietary changes, such as the practice of consuming more meat and/or protein). Food demand can thus possibly increase from 59% to anywhere around 98%, by 2050; these would bring an unprecedented change in the agricultural market. This further would make farmers to plan for increased crop production/ productivity, either through fertilizer /irrigation, or by adopting methods such as precision farming. At times, there also could be a possibility of increasing the cultivable land.

In the recent times, food markets have faced incidences of unpredictability; from pandemic outbreak, geopolitical risks, escalating trade tensions, and weather abnormalities. Majority of the food producers (farmers) move to urban areas in search for other employment opportunities since cultivable land area is decreasing at an alarming rate due to urbanization. By 2050, when 80 percent of the world's population is expected to reside in urban areas, it will face a huge challenge to feed this population in a sustainable way (Naachimuthu, KP, 2015).

With the world population expected to double by the end of the century, the need for food will become increasingly urgent. In addition to the issue of rising temperature, the expectation that world population would double (by the end of the century), force nations to relook in to their agricultural practices. This would specifically involve in growing more climate resistant crops, and to develop strategies that ensures adequate food supply for all. Globally, food prices are near their historic peaks, and food price volatility is widely seen as the "new normal." Managing this volatility and feeding a rapidly growing population will require sustained commitment, co-ordination, and vigilance from the international community to help governments put policies in place to help people better cope (Naachimuthu KP, 2015). While each and every system and practice is to create food abundance for growing population, there are concerns raised about food loss and food wastage and its global impact; the following data stands as a proof.

The below (Table 1) are statistics compiled by United Nations' World Food Programme (WFP) during 2018-19

Table 1: World Food Programme (WFP) during 2018-19

1	820 million people in the world do not have enough to eat in 2018 (1 in 9 people)
2	Largest number of undernourished people (more than 500 million) live in Asia, mostly in south Asian countries
3	45% of deaths among children under 5 years of age are linked to under - nutrition
4	Women make up a little over half of the world's population, but they account for over 60 percent of the world's hungry.
5	One out of six children - roughly 100 million-in developing countries is underweight.
6	1 in 4 of the world's children are stunted – in developing countries the proportion can rise to 1 in 3.
7	Across the developing world, and with 23 million in Africa alone, around 66 million primary school-age children were found to attend classes hungry



Fig.1: Showing the details of who Wastes Most Food.

Source: https://iqranetwork.com/blog/a-dinner-in-heaven/whos-wasting-the-most-food.

Worth of food wasted in India per year	Rs 92,000 crore (~1.2 billion tonne)
Food needed to feed India's population	~225-230 million tonne per year

Specific Steps that Could be Undertaken to Reduce the Wastage of Food Include:

- ***Revising Aesthetic standards:*** Food retailers with chain of retailing outlets demand aesthetically appealing food products of same size and shape, which forces farmers to harvest only homogenously looking food products, and many a times the rest of the food products can go waste.
- ***Applying Discrimination while Shopping, Cooking and Eating:*** Planning prior hand for what to shop with a simple shift in behavior using the shopping lists, and planning for meals would result in conscious purchasing rather than impulse buying. "…some of the sales promotions in practice would include promoting customers to buy more quantities of perishable food, which would increase the possibility of wastage at home. Overall between 30% and 50% of what has been bought in developed countries is thrown away by the purchaser." Also, while cooking, one can make optimum usage of trimmings and peelings, as they contain significant amount of nutrition. There are restaurants that encourage guests to take the left-over food home rather than wasting it. Each of us can promote the practice of taking the left-over food to our home rather than wasting it in the restaurants and eateries.
- ***Menu Planning***: Restaurants can use 'specials' to make effective use of food inventory that may soon go waste. They can also plan for repurposing food, half-order options, reducing the size of the food portions while allowing the customers to go for optional refills. Organizations that are engaged in food production and can influence them (restaurants, culinary institutes and bodies), can impart training on menu planning and inventory planning that will result in a reduction of food wastage.
- ***Encouraging Regional or Local Food Distribution*:** Promotion of food markets locally and regionally would result in alleviation of losses associated with fresh food produces that have lower shelf-life.

Reduction in food wastage will also result in more efficient and effective usage of land, water and energy.

Benefits of Reducing Food Loss and Waste

In 2016, the UN announced a global effort that seeks to reduce food waste; more specifically, the goal, is to reduce levels of food waste by 2030. UN mentioned that one-third of the food produced was lost or wasted worldwide, while on the other hand 800 million people are undernourished. When food wastage is reduced, it not only benefits the environment, but also offers financial benefits and food security benefits.

Environmental Benefits

WRAP (Waste & Resources Action Programme, 2018) said that food waste is responsible for 7% of all global greenhouse gas emissions, which is around 3.3 billion tons of carbon dioxide equivalent (CO2e) per year. By preventing one tonne of food waste from ending up in a landfill, we can prevent approximately 5 tons of CO2 from being emitted. Thus, preventing food wastage can have a positive impact on the climatic change.

Almost one fourth of the food produced with freshwater is never consumed. Therefore, the blue water footprint of global crop production or the uneaten plan-based food is 723 km3 per year/174 km3 of wasted blue water each year. Sustainable approaches to food production can decrease this waste and reduce the carbon footprint of food

manufacturing. As a simple and re-iterated solution of ages, to reduce food wastes lies in adoption of "sustainable production and consumption approach throughout the global food supply chain".

Financial Benefits

Reducing food loss and waste has financial benefits for businesses as well. According to the UN (2021), food waste adds up to a cost of $940 billion a year, a staggering figure. Just in the UK, the manufacturing and retail sector is estimated to waste 1.9 million tons of food a year worth £1.9 billion. According to WRAP (2018), grocery retail food waste costs £3,100 per tonne, manufacturing waste costs £1,200 per tonne, and packaging waste costs £1,600 per tonne. By targeting these areas and investing in more sustainable solutions, costs are likely to reduce, which was proved already. An analysis was performed using the report from across 700 companies in the world, and 1200 sites; it was noted that there was a positive ROI in 99% of the sites, in food loss and waste reduction programs. It was also found in few sites that for every penny invested the return was almost 14 times (Hanson and Mitchell 2017).

Food Security Benefits

Around 811 million people go hungry every day (FAO, 2021); by ensuring the reduction of food waste, globally everyone suffering from malnutrition can potentially be fed. By reducing the tons of food waste every year (most of it avoidable), one can expect that food security will improve. Food loss and waste is a global concern and tackling it will bring a wealth of benefits to the environment, manufacturers and distributors, and people.

Modern Agriculture and Its Impact

The nature of approach of modern agriculture is that it focuses on innovations in agriculture/farming practices which can help in creating abundance, resulting in increased efficiency of the farmers, and reduction in the amount of natural resources (water, land, and energy) used to meet the world's food, fuel, and fiber needs. The collaborative work among farmers and researchers, and the use of digital tools and data (across the public and private sectors) also enabled continuous improvement in the modern agriculture practices. While there could be advancement in the agricultural practices, some of the ground level issues need to be revisited. For instance, the important source for irrigation is still the ground water. Those nitrogenous fertilizers that are applied could contaminate the groundwater by leaching into the soil.

To be more specific, the increase in the nitrate level and long term intake of nitrate concentrations can cause a serious health hazard in children which is known as "Blue Baby Syndrome", and stomach cancer in adults (***Rahman, A., et.al, 2021***). Another issue of concern that could bring down the productivity is the salinity of the soil; it can possibly be handled through proper management of farm drainage.

Eutrophication is another concern; it refers to 'the addition of artificial or non-artificial substances such as nitrates and phosphate, through fertilizers or sewage, to a fresh water system'. This can result in the 'bloom' of phytoplankton; excessive use of fertilizers that has nitrogen and phosphorus may lead to over nourishment of the lakes/water bodies, and it may give rise to the phenomenon of eutrophication (eu = more, trophication= nutrition).

Problems Related to the Extensive usage of Fertilizers and Pesticides

Fertilizers are materials used to provide plant nutrients which are deficient in soils; many fertilizers are extracted and purified from natural deposits in the earth. Some materials, such as urea and ammonium nitrate are synthetic, but provide plants with the same nutrients that are found naturally in the soil. Some of the problems with extensive used of fertilizers and pesticides include:

- Oxygen depletion in oceans, result in reduction of oceanic flora and fauna-oceanic dead zones.
- Leaching of fertilizer into groundwater.
- Blue baby syndrome-Newborn babies with heart defects.
- Fertilizer Dependency Soil.
- Acidification and nutrient imbalance.
- Accumulation of heavy metals and radio-active elements.
- Increased pest fitness-Pests that survive pesticide spray give birth to 'superpests', the pests that are highly resistant to pesticide spray.
- Extinction of 'non-target' organisms – Many pesticides kill not only the organisms that cause harm to the crops, but also a broad range of organisms, which are useful to the sustenance of the eco-system.
- Contribution to greenhouse gases.

In order to handle all the issues discussed above, consciously choosing to reduce the food miles may serve as a viable solution.

Food Miles

The question of how the items on our dinner tables would have a larger impact on the ecosystem, led to the broad concept of food miles (the distance food travels from production to consumption). With increasing globalization, our plates have progressively included food items from other continents (FAO, 2004). Previously it would have been too expensive to transport these products. However, changes to agricultural practices, transportation infrastructure, and distribution methods now mean that people in the United States can start the day with coffee from Brazil, have a pasta lunch topped with Italian cheeses, snack on chocolate from Côte d'Ivoire, and end with a dinner of Mediterranean bluefin tuna and Thai rice.

On the other hand, the globalization that led to the increased availability cam with associated costs, such as, increased traffic congestion, the emission of greenhouse gases and other pollutants, less fresh food, lack of support for local economies, and decreased food security. Therefore, the concept of measuring food miles was meant to provide an easy comparison of the relative impacts of our food choices.



Fig. 2: CO2 Emission–in transporting one tonne of cargo.

https://www.researchgate.net/figure/Grams-of-CO2-emitted-by-transporting-1-tonne-of-cargo-1-km-using-respectively-container_fig1_327211573

When it comes to the amount of CO2 emitted (per mile) to transport one tonne of food, the least polluting and least expensive means could be shipping, but it isn't the feasible mode for all itineraries. Rail and road haulage follow next in the ranking; these means of transport are privileged on a national or continental scale, with rail being used mainly to cover long distances. Finally, air freight can leave the greatest of the environmental impact per ton of cargo. There also comes the other mode of shopping for consumers i.e. their personal vehicle (Car, for instance) which can also increase the environmental impact of transportation) (Brouer et.al, 2018). To give an example, transporting one ton of tomatoes by lorry from Spain to England (1860 kms) generates the same amount of CO2 as shipping it from Mexico (9048 kms).

Food miles are often tied to locavore movements, which emphasizes the consumption of locally grown food products. Local foods are given this emphasis since it is usually fresh (with less processing and fewer preservatives), and with harvesting waiting until produce is ripe. While several people choose locally grown food stating that it tastes better, others prefer to be a locavore since it could strengthen the (local) cultural identity and/or that the safety of the food is being controlled by people who also consume the products themselves. Eating local foods also is said to promote food security, reduce GHG emission, since the availability and price of imported foods is dependent on fluctuating fuel costs and sociopolitical conflicts elsewhere (IPCC, 2015).

Locavorism

Locavorism refers to 'the practice of purchasing and consuming food grown within a relatively short distance from one's current location in preference to food grown further away.' The word 'local' refers to buying products which are available in closer proximity. There exists an enthusiasm in countries like United States of America nowadays for eating and consuming local food. The term 'local' is still contested and its definition varies from one local market development organization to the next. Literally, the term 'local' indicates a relation to a particular place, a geographic entity.

Since 1990s, several authors and fields of study have begun to broaden the concept of 'local' beyond the context of physical space and a simplistic political operational perspective (Raffeatin, 1993; Souza, 2002; Haesbaert, 2002; Bonnemaison, 2002; Sen, 2004; Akerman, 2005). Thus, people who prefer to eat locally grown food are referred to as localvores or locavores.

Locavorism is an effort to build more locally based, self-reliant food economies 'one in which sustainable food production, processing, distribution, and consumption is integrated to enhance the economic, environmental and social health of a particular place'. A locavore prefers to consume food that is produced locally within a limited radius of 50 or 100 miles.

Benefits of Locavorism

Buying local food is better for the economy,

environment, health, the local community than buying non-local food. There will be more trust and connectivity. There will be more economic benefits to producers and local communities. Food security (feeding the 'food deserts') and health benefits (fresh food, more nutritious, environmental benefits). Environmental and health benefits are minimizing the carbon footprint. Social benefits bring a happy state of mental well being between producers and consumers. Economic benefits through greater incomes for farmers and more financial contributions to local economies. We are morally required to do what is best for the environment. We are morally required to buy local food in preference to non-local food.

Local food is usually grown with normal seeds without using chemicals. When such food is consumed locally, it also helps in land conservation and it also reduces packing of products. This also meets the Triple bottom line (People, Planet and Profit). Thus, this benefits the people in the particular environment, this benefits the planet in terms of environmental sustainability, and gives a raise in the economy. This practice can also have a relational aspect between the farmer, producers and the customers. By practicing Locavorism one can also get the best benefit of the money they earned; this can be called enlightened self-interest, which means a person who serves for the betterment of others and the economy and environment on their own interest.

The main part of consuming local food is it reduces the usage of fuel which reduces a large amount of pollution; transporting food increases pollution which increases carbon emission and this causes problems in our respiratory ailments. But, not all foods can be grown in all regions like meat is well grown in warmer regions, this could give us more health benefits like it could increase the iron, it gives us strong bones, Lipid Profile and Cardiovascular health, increases the level of vitamin B-12. But the flip side to this is "One hectare of land can, for example, produce rice or potatoes for 19–22 people per annum. The same area will produce enough lamb or beef for only one or two people (Tejinder Narang, 2017). "Considerable tensions are likely to emerge, as the need for food competes with demands for ecosystem preservation and biomass production as a renewable energy source", states UK's Institution of Mechanical Engineers (2015).

The local food initiatives (2006) benefitted Canadians these ways (Humaira Irshad, 2010):

- It benefited local economy (71%).
- Supported family farmers (70%).
- 53% percent of respondents stated that locally produced food taste better.
- 50% said they are cheaper.
- 48% said they are not genetically modified.
- 45% said they were healthier.
- 44% said they were safer.
- 43% thought they were more environmentally friendly.
- 70% of the people stated that their favorite was the local brand than the imported brands.

Arguments Challenging Locavorism

Not all the time locally grown food is natural sometimes they are added with chemicals too; a local farmer can't control everything. One of the report published in NewYork Times (2012) stated that many eggs from chickens raised in community gardens in New York City contained elevated levels of lead, because such heavy metals are often present in urban soils.

In some parts of the world like Sub-Saharan Africa, where people rely completely on locally produced food, malnutrition and hunger are widespread, and it could be due to the monotonous diet (Desrochers and Shimizu, 2012). The modern world has created a "food cornucopia" that it could successfully feed 6 billion people, and has reduced the percentage of the world's population suffering from malnutrition and starvation (The Week, 2015). Using local ingredients can have some environmental benefits, but creating a whole system of eating solely through local produce might leave one's diet sorely lacking and perhaps even nutritionally imbalanced, not to mention having some negative environmental repercussions.

For example, while it's great that supermarkets have been increasing their support of small farmers by stocking their produce, if transportation is inefficient, a 1,000 mile tomato could be more carbon intensive than a 5,000 mile tomato. It may feel more virtuous to eat locally produced food, but some economists say the belief that it reduces greenhouse gas emissions is largely illusory. To begin with, transportation contributes to less than 11 percent to the overall carbon cost of an average food item (***Christopher L. Weber., & H. Scott Matthews, 2008***)

Although local can promote better environmental,

social, justice and economic conditions, it can also harm them by engaging in hierarchical arrangements like there could be a barrier to people who cannot afford to the cost of local produce, due to the possible elitism that can pop up **(*Okeke, Remi, 2017*)**. Local farmers also needs to be realistic about what they can grow, not growing unsuitable crops/livestock that my harm their environment.

The Slow Food Movement

Slow Food is a 'global, grass root organization that promotes local food and traditional cooking'. As an organization, they work across the world raising awareness about issues concerning food system, and also work in the areas of protecting the food biodiversity, establishing linkages between producers and consumers. Slow Food began its journey during 1980s with the initiation by Carlo Petrini and a group of activists primarily to defend regional traditions, good whole food that serves as a gastronomic pleasure, and advocated the need for cultural shift towards slowing down the pace of life **(*Knox, P. L., 2005*).**

Over the decades, the slow food movement has evolved so much that it could develop a comprehensive approach (to food and food system) that recognizes the strong connections between plate, planet, people, politics and culture. Slow Food movement has really turned global in its presence and operation in over 160 countries, involved in several thousands of projects.

Their initiatives include:

- Saving endangered foods and defending gastronomic traditions through biodi versity projects.
- Teaching the pleasure of food and how to make good, clean and fair choices through food and taste education.
- Celebrations of the gastronomic traditions of Europe and Asia, artisanal cheese and fish, and meetings of worldwide networks in the international events.
- From animal welfare to land grabbing, addressing themes that they care about.
- Connecting people passionate about changing the food system through the international network.
- Promoting innovative ways of travelling that get one to the heart of food cultures, through the Slow Food Travel destinations, and the Airbnb Slow Food experiences.

As a sign of success to all such movements in the history, a resolution was passed during the 72nd session of the United Nations General Assembly, acknowledging the role of family farming in achieving the Sustainable Development Goals, sustainable food production, food insecurity & malnutrition, and eradication of poverty. Despite several constraints like lesser access to energy, clean water, and sanitation, family farmers produce over 80 percent of the world's food (in value terms) and hold unique potential to become key agents of development strategies.

Conclusion

Locavorism not only talks about growing/ consuming locally, but growing crops / food locally using sustainable farming methods/practices; it is an environmental movement. The core idea is not about propagating radical locavorism, but about choosing to be a locavore by increasing Sustainable Urban farming practices in every household to meet their household vegetable/nutrition requirements through their roof top/kitchen garden. Several countries embraced such urban sustainable farming practices to beat the heat, and to meet the food and nutrition security; for instance, NewYork 2030 plan to create roof top garden to meet vegetable needs of every house.

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