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Significance of Food Security and Safety behind India's Sustainable Urban Development

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Abstract

The foundation of sustainable urban development lies on the steps taken by a city to reduce its climate change." Multiple aspects of it primarily include water supply, health care, affordable housing, transportation, electricity and sanitation. The most important goal of any sustainable city or smart city is to secure "healthy and safe life" for its people without losing the existing natural resources. Foundation of "healthy life" originates from sufficient availability and right intake of food by people from all economic classes. But unfortunately this fundamental factor of nutrition and food security is often not given importance during designing sustainable smart cities. It is also not realized that food security cannot be achieved without ensuring food safety, as consumption of unsafe food does not lead to a sustainable society. Warranting food safety and security is a big challenge for any country. The problem amplifies even larger in case of developing countries including India. A food may be unsafe for consumption due to both chemical and microbiological reasons, incidentally or intentionally. Therefore, it will be highly beneficial to know about different aspects of food security and safety hazards before planning for building a smart city. This article targets to identify the vital challenges encountered by Indian towns and cities with respect to food safety and security and suggest possible avenues to overcome those. It also includes the initiatives taken by India to build smart cities.

Keywords: Sustainable urban development; Smart cities; Food security; Food safety, Food adulteration

INTRODUCTION

Sustainable Urban Development

Sustainable urban development is a way to use the resources and space of a city minimizing damage to its environment. The most important aim of it is to secure healthy and safe life for its people without losing the existing natural resources [1–3]. The concept of sustainable urban development is based on three pillars, which are:

1. *Environmental goal:* The city must ensure Conservation of its natural resources, such as, water, energy, green space. It should also generate scope for adequate sustainable transportation.
2. *Social goal:* The urban population are often found to be with excessive mental stress, depression, loneliness, psychological trauma. The smart cities must ensure that its citizens feel active and equal.
3. *Economic goal:* Urban economy is mainly industrial, which is well known for contributing towards environmental pollution and depletion of the health of the people residing there. Smart cities should be more inclined towards industry and businesses involving and promoting green energy.

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Food Security and Safety

A country or city or town is known to have food security when all residents there have economic and physical access to sufficient, safe and nutritious

food at all times to meets their food preferences and dietary requirements for a healthy and active life. Food insecurity has a negative impact on cognitive, social, emotional, and physical development and directly impacts the second goal of sustainable urban development. No urban development can sustain without food security. Food security is linked to all recent Sustainable Developmental Goals (SDGs) of the United Nation [4]. Unfortunately, this fundamental factor of nutrition and food security is often not given importance during designing sustainable smart cities.

REASONS BEHIND FOOD INSECURITY IN CITIES

There are multiple obstacles to overcome before establishing food safety and security in Indian cities.

- *No access to sufficient Food:* This can happen because of many reasons Although primarily the reason for not having access to adequate food is poverty or poor financial state of a certain section of city dwellers, yet the mis-management in the supply chain factor cannot be overlooked. The lack of strong urban-rural linkages has been one of the key reasons behind the supply chain disruption, causing massive food spoilage and wastage. This issue became even more noteworthy during COVID-19 pandemic and till now continues to be a major disrupter [5].
- *No access to safe food:* Ensuring food security alone does not guarantee access to chemically and microbiologically safe food. Adulteration of food, Mis-labeling of food products, loop-holes in existing Food Safety Acts and lack of infrastructure for quality monitoring and implementation of the FSA can further contribute to the problem. Adulteration of food is one of the most protruding challenge in Indian cities

Food adulteration is defined by the Food Safety and Standards Authority of India (FSSAI) as the addition or subtraction of any material from food that modifies its composition and It can be of two classes; (i) *Incidental:* adulteration with non-food items, droppings of rodents, debris, etc. This happens due to lack of infrastructure during manufacture and storage. (ii) *Intentional:* Adulteration with hazardous contaminants, unpermitted colors, flavors, preservatives, which are done intentionally for financial gain. Since independence, number of both types of adulteration cases has been increasing in and around the cities throughout India. However the number of cases that have been documented has significantly increased in the last Couple of decades.

One possible reason may be the lost connection between the food manufacturers and the consumers. Manufacturers and consumers frequently have little to no direct engagement as a result of changes in India's socioeconomic culture, which include a higher reliance on pre-processed meals and improved transportation infrastructure. This reduces perceptions of accountability or guilt burden on the unlawful manufacturers. Recent study [6] conducted by our research group in the five states of South India on 150 randomly chosen samples from regularly consumed food groups, such as, dairy, grains and pulses, spices (whole and powder), honey and coffee, found significant adulteration cases. Unpackaged retail products showed a greater rate of adulteration

Another recent threat rising in this field is "Mis-labeling and false branding" of packaged food items

A recent study [7] done by our research group found that, only less than 6% of four thousand "organic pickles" available in various Indian e-commerce webpages, really contain the required certifications from authorized regulatory bodies like Jaivik Bharat, NPOP, etc. In an effort to trick customers, some items only use the word "organic" in a catchy tagline or as part of the brand name on their labels. But after Carrying outchemical and spectroscopic analysis, it turned out that all of these goods, which were advertised as "organic" pickles contained unpermitted preservatives and additives.

Although the introduction of FSSAI have made the food laws and regulations much more stringent than before, yet many loop-holes are still existent, which are being used by the unlawful FBOs to escape with. Lack of infrastructure for monitoring food quality, such as, analytically trained technicians, sophisticated laboratory facilities and advanced analytical equipment, indifferent attitude of the local governing bodies to food quality, restrict the implementation of the food safety acts.

No access to nutritious food: Many urban dwellers suffer from lifestyle disorders such as diabetes, obesity, and hypertension, which prompts them to look for natural and organic food options, weight loss medications, immune boosters, and health supplements.

Most of the time, they choose their diet under the influence of advertisements and peer pressure without evaluating the real dietary need of that individuals. This often leads to improper nutrition and adverse health damage. Excessive reliance on processed and pre-packaged food, ignorant, advertisement driven decision making on diet selection deprive them from accessing nutritious food [5].

POSSIBLE SOLUTIONS

Sustainable urban development can be successfully achieved only if majority of the above issues described above are addressed and solved. Existence of Smart cities depends entirely on supply and interlinkages of water, energy and food (WEF). Few of the recommendations given by FAO for developing Smart Cities are, (i) promoting urban agriculture, (ii) encouraging healthy diet, (iii) reducing and managing food wastes, (iv) boosting green spaces for healthier environments and improved lifestyles and most importantly (v) connecting cities with nearby rural areas [2]. Below mentioned are some of the effective ways to make cities independent in terms of food security.

Urban Farming, Vertical Agriculture [8]

India occupies approximately only 2.4% of world's land area but accommodates world's 17.7% population. Currently 55-60 % of our population is urban. The growing worry of food security in urban areas is apparent, as the nutritional state of the population is a reflection of urban poverty. Therefore promoting urban agriculture can be a great way to enhance city's independence with respect to food ingredients supply.

Hydroponics and Vertical Farming [9]

Hydroponics or soil less farming is a technique where plants are geown using a water-based nutrient solution rather than soil. It involves an composite substrate or growth media, e.g. coconut coir, perlite or vermiculite. Hydroponic farming is popular among small farmers and commercial enterprises. In Vertical hydroponic farming, crops are stacked in layers or vertical towers, usually within indoor environments

LED lights are often used to simulate sunlight and to ensure optimal growth conditions throughout the year. Advantages of hydroponics are space efficiency, year-round cultivation, water conservation, reduced pests and diseases and higher crops yields. With this type of farming it is possible to supply fresh, locally grown produce to urban populations, besides reducing the carbon footprint, which is otherwise associated with long-distance food transportation. Currently available commercial hydroponics brands in India are Nutri-fresh, Urban Kisaan, Future Farm, etc [8].

- *Building of Storage Houses:* For cereals, grains and fresh produces (veg, non-veg, dairy and horticulture) with advanced facilities within the city or at the outskirts may certainly help to deal with the transportation issues and may reduce spoilage lead wastage during transportation.

Quality Check, Adulteration Control by Food Safety and Standards Authority of India (FSSAI)

Established in 2006, FSSAI brought all existing food related regulations under one roof and right now the main regulatory body to ensure food quality and safety in India. FSA act 2006 and successive amendments take care of all sorts of processed and unprocessed foods, raw materials, organic foods, health and dietary supplements, etc in India. FSSAI does an impressive job in regulating the packaged

food, however, monitoring the unorganized sector is still a challenge. The rules related to the use of the terms "organic", "healthy", "natural" has to be revised and more profound to stop exploitation of the consumers. Inspite of the legal implications of FSSAI 2006 Act and its amendments, it is nearly impossible to properly penalize offenders because of the many gaps in the current legislation. In order to prevent adulteration and enforce food safety standards, local governing entities must take an active role in the process [10, 11]

- *Increasing Public Awareness:* On adulteration of food, false branding, mis-labeling, false health claims by the manufacturers for sell enhancement is necessary to alert the consumers. Educating them on the nutritional aspects of foods, teaching them on how to read the labels of packaged food may further help them to choose their diet without any preconceived notion. Educational institutions, government bodies, and non-profit organizations can come together and collaborate to disseminate comprehensive food safety training to the city residents. This education would possibly empower the individuals to make informed decisions about the food they consume, understand the risks associated with unsafe practices, and adopt preventive measures to safeguard their health Every year on June 7th, World Food Safety Day is marked as a way to honor these efforts.

Educating farmers and food producers about the best cultivation, harvesting, processing, and storage practices can improve food safety standards. By equipping them with knowledge on safe use of pesticides, proper waste management, and quality control, can further reduce the likelihood of contamination. Overall, integrating food safety education at various levels of society can create a culture of awareness and responsibility, leading to healthier food practices, safer consumption habits. It can also promote and nurture a more sustainable food system by encouraging the adoption of sustainable farming techniques, promoting local, organic food production, and reducing food waste.

INITIATIVES TAKEN BY INDIA TO BUILD SMART CITIES

The Ministry of Housing and Urban Affairs (MoHUA) Smart Cities Mission in collaboration with Food Safety and Standards Authority of India (FSSAI) launched "*Eat Smart Cities Challenge*" on April 15, 2021 to upscale the Eat Right India approach to city level [12]. This initiative is truly recommendable, because, India started it at a point when the concept of Nutrition/Food Smart City was still in its infancy globally. Through the" Eat Smart Cities Challenge", India started playing a pioneering role to include food systems into the arena of city planning and development. The above mentioned challenge was basically a competition amongst participant cities to acknowledge and appreciate their efforts in implementing and scaling up versatile initiatives under "Eat Right India". The cities that took part were required to come up with a plan that was in line with the Eat Right India initiative and would promote a safe, healthy, and sustainable food system [12].

The designed strategies were expected to establish proper physical, institutional and socio-economic infrastructure along with proper implementation of smart solutions to overcome food related issues. In that plan, all stakeholders and citizens were asked to be equally involved in the decision making. It was anticipated that, participating in this challenge would inspire the cities to adopt initiatives under Eat Right India in a stringent manner, set specific timelines for implementation of the strategies and create an overall vision to reform their food ecosystems. Restructuring food ecosystems will eventually improve infrastructure, food safety procedures, and hygiene standards while giving inhabitants adequate access to wholesome food.

It was also expected to promote smart food choices amongst its residents, to improve health outcomes and to reduce healthcare costs, as safer and healthier food consumption always lead to reduction in non-communicable diseases, food-borne illnesses, hidden hunger or micronutrient deficiencies. Hence, it was anticipated that the "Eat Right India" challenge would reduce the healthcare expenditure for the

participating cities and they would be able to utilize those saved resources for other development measures. As an indirect effect, optimization of food safety measures for small scale food businesses, e.g. local popular street foods, would help to boost tourism industry in those cities. Not only the health and tourism, it was expected that those cities would make cleaner and greener environment by following environmentally sustainable food practices such as reusing of used cooking oil, zero food waste, zero plastic waste and circular economy. While reforming all these food ecosystems, the smart cities would also generate knowledge and database for national evidence-oriented planning for smarter food solutions, which in turn, would boost city's employment and green economy [13]. Complete makeover of urban food systems would also create new green jobs and boost circular economies. The result of the challenge was published on 16th March, 2022, where 11 cities were chosen from 108 Indian cities for participating in the next level [13].

CONCLUSION

Food safety and security in India poses still a significant challenge to sustainable urban development. As cities expand, the demand for food products escalates, increasing opportunities for unscrupulous practices in the food industry. Promoting urban agriculture, raising public awareness about healthy diet, stringent monitoring and vigilance on food quality, effective implementation of food safety acts, sustainable ways of food waste management, can be fruitful in ensuring food safety and security in the new cities. By ensuring the integrity of the food system, cities can create healthier environments, promote equitable access to nutritious food, and contribute to the overall well-being of urban populations while advancing sustainability goals. Initiatives such as "Eat Smart Cities" should be supported and promoted to larger scales to transform the food ecosystem of more number of Indian cities.

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