

FOOD ENVIRONMENT: CONCEPTUALIZATION AND IMPORTANCE IN PERSPECTIVE OF URBAN INDIA

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Abstract: Food environment of an individual is characterized by the 'availability of food' and 'affordability of food'. The latter determines the type of food available that is nutritious or non-nutritious nature of food while former determines the access to food in terms of purchasing power of people. These two components of food environment collectively play a major role in determining the food and nutritional security of any region. Country like India is characterized by the disparity in income-levels, demography and development. Likewise, India is characterized by regions with varying degree of 'food security' and 'nutritional security'. The present research article discusses the concept of 'food environment' in perspective of urban India. Further, the present research study investigates that how the above-mentioned concepts helpful in identifying the regions with food security and nutritional security or both. The study is based on secondary data collected from various governmental and non-governmental agencies.

Key words: Food Environment, Food Desert, Food Security, Nutritional Security

Introduction

The consumption of food is not an assurance about 'nutritional value' because 'availability of food' varies from one region to another while 'affordability/purchasing power' varies from one individual to another. Consequently, some people are having surplus food while others struggling for one-time meal. In other words, nutritional value, food availability and affordability/purchasing power of people collectively determine the 'food environment' and helps in classifying places either as 'food desert' or 'obesogenic environment'. Food environment offers different choices to an individual and thus determines quality of diet, eating choices and health aspects related to diet. The present research article deals with concept of food environment and classification of food environment. Further, India's 94th position in Global Hunger Index, 2020 makes it more important and relevant in Indian perspective.

Objectives of the study

- To conceptualize and discuss elements, aspects, classification of food environment.
- To discuss inter-relation of food and health with special reference to 'ready-to-eat-food' culture in urban Indian perspectives.

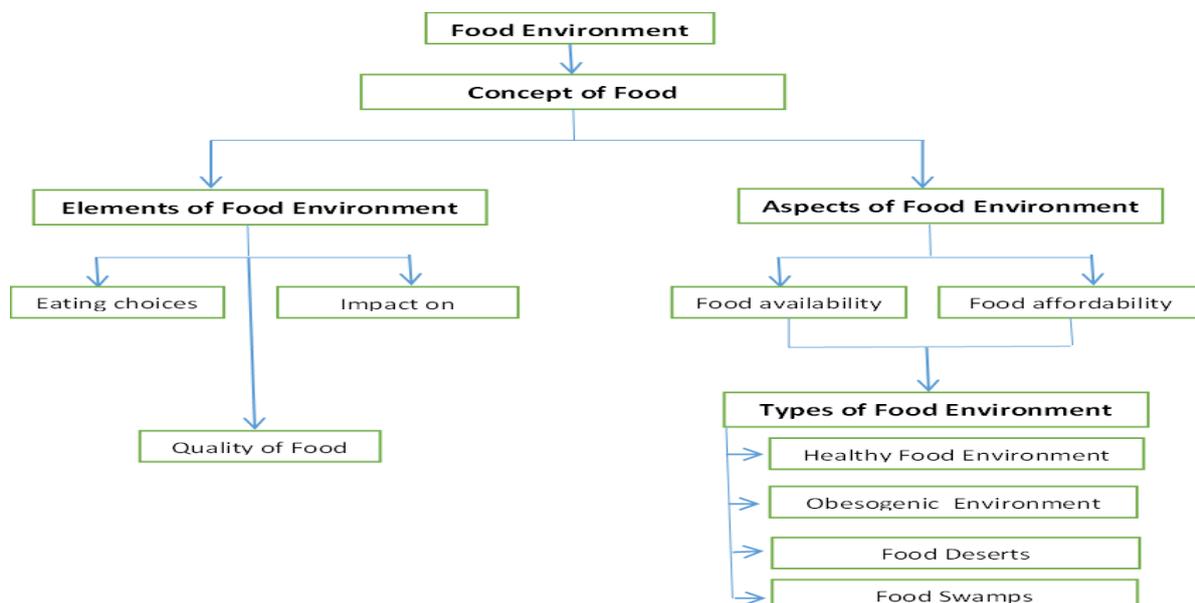
Database

The present research study is based on secondary data obtained from various governmental and non-governmental agencies viz. National Family Health Survey (NFHS) - 4, 2015-16; Food as Toxin' published by Center for science and environment, New Delhi, India; Global Hunger Index Report, 2020; The India State Hunger Index (ISHI), 2008; The Nutrition Index of India, 1994. Reports, articles and other published material of The Public Health Foundation of India (PHFI), National Institute of Medical Statistics (NIMS) and National Institute of Nutrition's Dietary Guidelines (NINDG). Apart from above secondary sources, various magazines, newspaper articles have been consulted in the present research study.

Concept of Food Environment

Cultural set-up and traditional values play a major role in creation and development of food environment of any region. Food environment is the response of physiography, socioeconomic and food habits prevailing in any region. Thus, food environment can be defined as availability of food either as natural supply or man-made food outlets.

Figure 01: Concept, Elements And Aspects of Food Environment



Source: Developed and prepared by the author after thorough literature review

Elements, Aspects and Classification of Food Environment

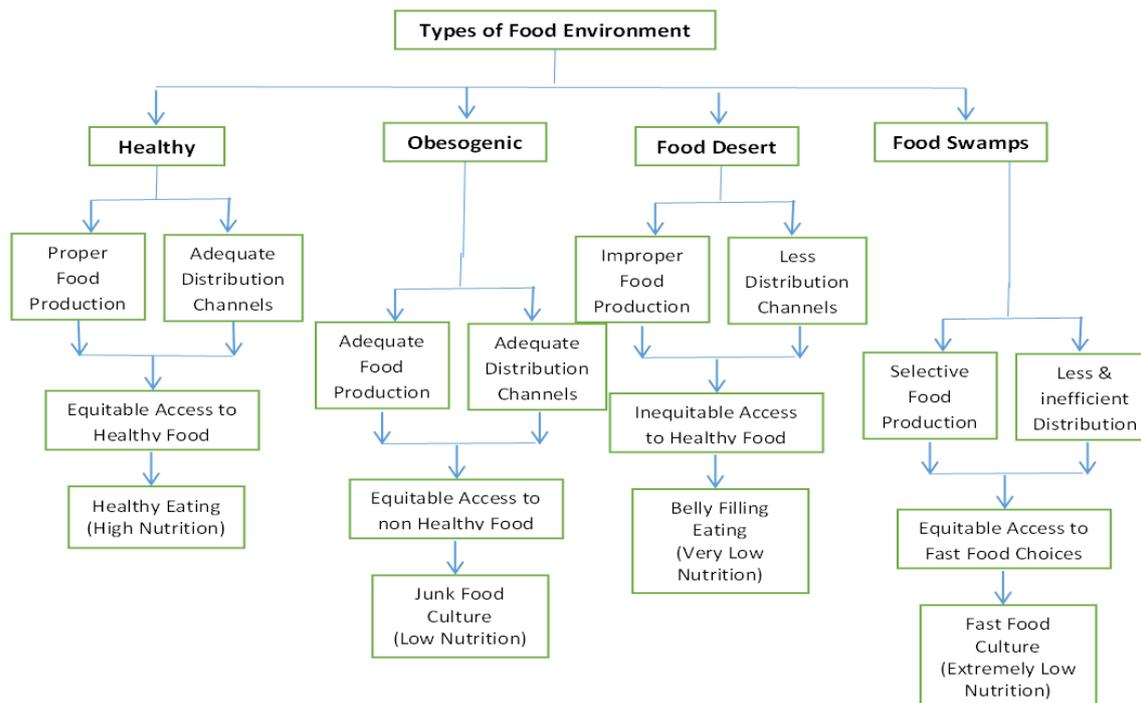
The nature and composition of food environment is governed by eating choices of individuals, quality of available food and its impact on human health (figure 01). Eating choices of individuals serve as major determinant of food environment by regulating the 'demand and supply' factor. People prefer to eat food items of their choice and therefore supply of food items as per the demands of eating choices and thus, governing the composition of food environment of any region. Second element is quality of available food and is based on the principle 'value for money'. People spend money to buy food items and in no case, they will buy poor quality food items. Third element is 'impact of food on human health' which explains that food item irrespective of its quality and taste cannot be part of food environment if they have negative impact on human health. Food availability and food affordability are two most important aspect of food environment. The first aspect of food availability is related to 'demand and supply' rule while food affordability is all about economic /financial stability in terms of purchasing power. These two aspects are interdependent and directly proportionate to each other. None of the two aspects mentioned above can exist in isolation.

Based on these two aspects food environment (figure 02) can be classified into four categories viz. healthy food environment, obesogenic environment, food deserts and food swamps.

- *Healthy food environments* are characterized by the 'healthy eating' with high nutrition value. Here, proper food productions and enough distribution channels results in equitable access to healthy food choices. People are more health oriented with high economic stability in terms of purchasing power. Further, peoples evaluate all the three elements of food items thoroughly before making them part of their food habits.
- *Obesogenic food environment* is characterized by 'addiction' of food with low nutrition and high calorific value. Here, food production and distribution channels are adequate in terms of non-healthy food choices and consequently, people have equitable access to non-healthy food choices. Basically, 'junk food culture' prevails in this sort of food environment. Further, people are aware about the impact of non-healthy food on human health but it is their addiction to 'junk food' which drags them to opt for non-healthy food choices.
- *Food deserts* is a kind of food environment characterized by 'oasis' of healthy food choices and dominance of non-healthy food choices. Further, conditions are worsened by the improper food productions and less distribution channels and consequently, people have inequitable access to healthy food choices. Moreover, poor purchasing power of people made them to adopt 'belly filling culture' characterized by very low nutrition value.
- *Food swamps* are worst kind of food environment characterized by 'fast food culture' with extremely low nutrition value. Food production of selective food crops and inefficient distribution channels compelled people to opt for fast food choices. Here, people ignore all the three elements of food items due to their limited purchasing power and aspects like food availability and food affordability are completely missing from this sort of food environment.

Among the above-mentioned categories of food environments, the most prevalent categories include obesogenic environments, food deserts and food swamps and need to be removed through multiple, effective and efficient policies and programs. These policies and programs will improve availability, prominence and affordability of fresh and healthy foods.

Figure 02: Classification of Food Environment

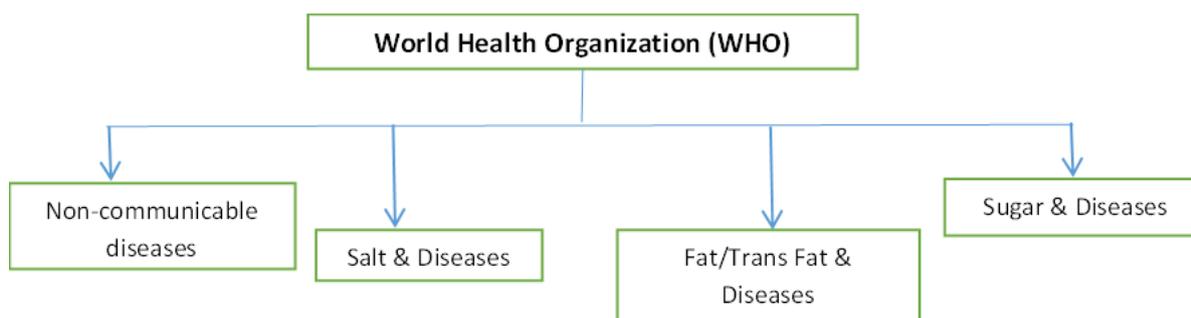


Source: Developed and prepared after thorough literature review

Food and Health - Perspective of World Health Organization (WHO)

Physical and mental health of human beings depend on type of food we eat. Safe and healthy food options will improve availability, prominence and affordability. Healthier food choices will promote ‘health-based menu’. ‘Health equity’ can only be achieved through food environments with healthy and safe food choices accessible to everyone. Further, healthy food environments support healthy eating behaviors which in turn prevents chronic diseases. World Health Organization (WHO) (figure 03) talks about diseases and their relationship with dietary food habits of human beings. WHO gave us four broad categories of diseases related to consumption of food viz. non-communicable diseases (NCDs), salt and diseases, sugar and diseases and fat/trans fat and diseases. WHO data reveals that non-communicable diseases like cardiovascular diseases, cancers, diabetes, chronic respiratory, digestive diseases are responsible for 70 percent of global deaths. Also, 15 million people aged 30-69 years die from a non-communicable disease. Income-wise study shows that 86 percent of premature non-communicable diseases (NCDs) death occur in low- and middle-income countries (LMICs). WHO says that NCDs can be prevented through proper diet and regulated consumption patterns.

Figure 03: Food and related diseases as per World Health Organization (WHO), 2016



Source: Developed and prepared by author based on the report of World Health Organization (WHO), 2016.

Apart from NCDs, WHO talks about various diseases resulted to the high and imbalanced consumption of salt, sugar and fat/trans fat. Firstly, the high consumption of salt in our daily diet results in cardiovascular ailments. The amount of salt consumed by people on regular basis is much higher than the prescribed limit. The reason behind is the unchecked consumption of spicy and salty food, salty chips, biscuits, namkeen and other fast foods. WHO recommends salt intake of less than 5 gm per person per day to prevent the risk of cardiovascular diseases. Second is intake of sugar which if taken in excess disturbs the normal metabolism and other hormones of human body (Table 01). Here, we need to understand that 'which form of sugar is harmful for human body?' The common sugar is composed of glucose and fructose. The characteristics of two components are entirely different. Glucose is less sweet and get metabolized in every cell of the body. On the other hand, fructose is comparatively double as sweet as glucose and breaks down only in liver. The high use of sugar particularly fructose is harmful cause it is addictive and induce us to eat more. The sugar dampens the suppression of hormone 'ghrelin' which signals hunger to the brain. Also, interfere with the normal transport and signaling of the hormone 'leptin' which helps produces a feeling of satiety. Moreover, it reduces 'dopamine' signaling in the brains reward center, which in turn reduces pleasure derived from food, compelling individuals to eat more. Similarly, consumption of fat and trans-fat results in large number of ailments. Energy from saturated fatty acids accounts for a third of the energy from total fat. With notable exception of southeast and south Asia, where it accounted for as high as 40 percent of total fat.

Table 01: Nutritional Guidelines

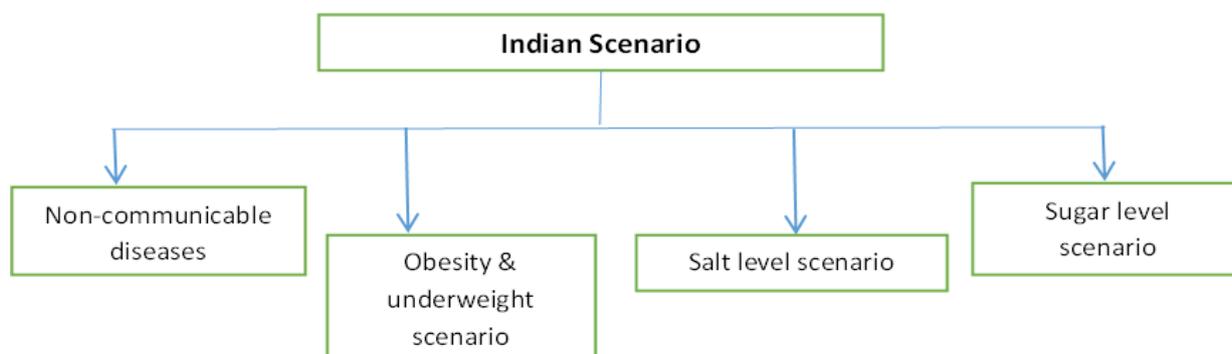
Sample name	Kilo calories allowed/daily	Carbohydrate (g/100 or %)	Salt (g/100 or %)	Total fats (g/100 or %)	Trans fats (g/100 g of food)
Adult male	2,320	290-348	6.0	39-78	2.6
Adult female	1,900	263-315	6.0	35-70	2.1
Children (10-12 yr.)	2,100	238-285	6.0	32-64	2.3

Source: Centre for science and environment, New Delhi, India

Food and Health - Indian Scenario

India being a country of spices and taste has its own flavour of health. But due to western influence, change in dietary habits, reduced physical activity, unplanned and sedentary working hours, improper diets due to fast food culture have made India unhealthy and obese country. Currently, India is suffering from several health-related issues and food environment has also shown deterioration during the past few decade (figure 04).

Figure 04: Food and related diseases in Urban India



Source: Developed and prepared by author after thorough literature review.

The public Health Foundation of India (PHFI) states that non-communicable diseases (NCDs) account for as much as 53 percent of the total mortality and 44 percent of the disability adjusted life years (DALYs) in India. Likewise, the other agency named National Institute of Medical Statistics (NIMS) talks about shocking increase in hypertension not just in urban areas but also in rural India. Rural India is getting urbanized in terms of food and lifestyle with use of tobacco, alcohol and junk food on the one hand, lack of exercise and decreased consumption of vegetation on the other hand. If we got through the data of National Family Health Survey (NFHS) then India became 3rd most obese country in the world. The males and females of both urban and rural areas are equally facing the threat of obesity and issue of under-nutrition. According to NFHS data, urban areas have 19.7 percent of obese males as compared to 10.6 percent of obese males in rural areas. Similarly, urban areas have higher percentage of obese females' 23.7 percent as compared to 10.7 percent obese females in rural areas. Now, if we talk about under-nutrition children then percentage increased from 19.8 percent (2005-06) to 21 percent (2015-16). This means that one in every five children below five years has a lower body weight for his/her height.

Talking about the salt scenario in India then our country is facing serious salt problem. In India, nearly 40 percent of the population consumes about 10 grams of salt per person per day. The data presented by the National Institute of Nutrition's Dietary Guidelines (MINDGs) shockingly reveals that India's current consumption is between 5 to 30 gram per person per day across different states. The data of NFHS reveals shocking sugar level scenario in India. As per NFHS, 8 percent of men in the age group of 15-49 years have high blood sugar levels, 13 percent are hypersensitive, among 15-49 years age group about 8 percent men and 5.8 percent women have high blood sugar levels. Likewise, 13.6 percent men and 8.8 percent women are hypersensitive.

Dominance of Ready-to-eat-food Culture in Urban India

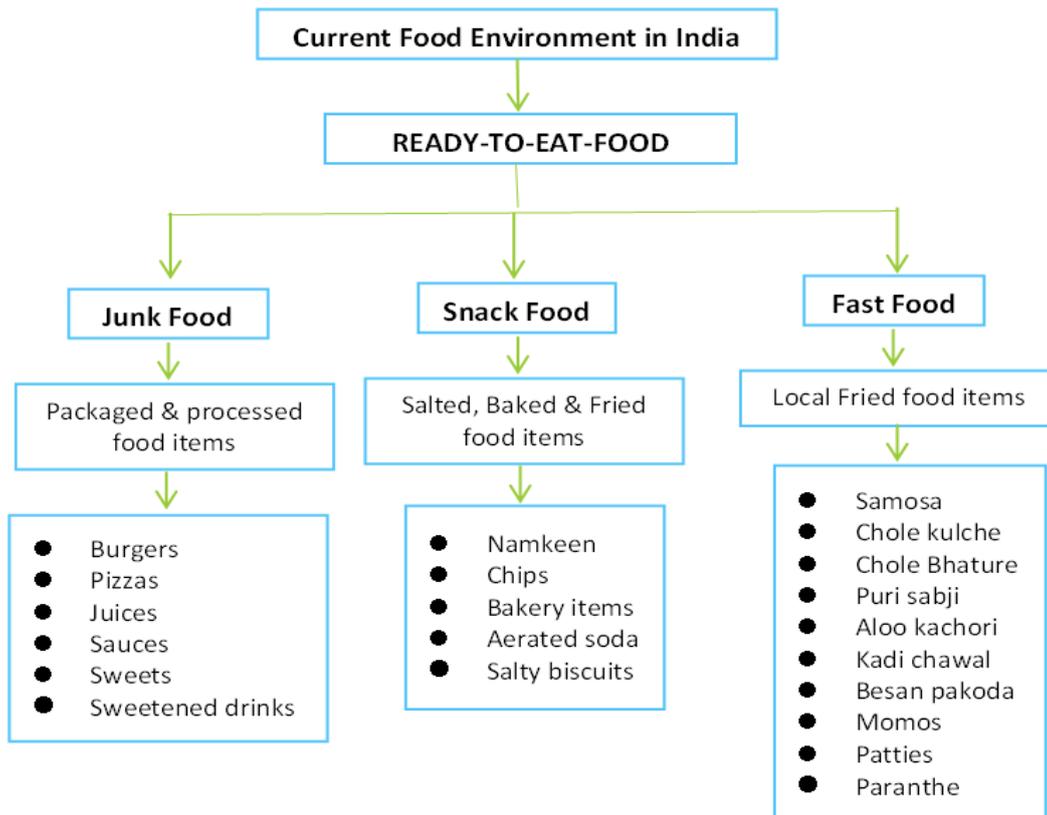
'Ready-to-eat-food' (Figure 05 and Table 02) is dominating the food environment in India irrespective of income level, age-wise and societal status of people. This 'ready-to-eat-food' can be broadly classified into three categories viz. junk food which includes the packaged and processed food items such as burgers, pizzas, juices, sauces, sweets and sweetened drinks, snack food which includes salted and fried baked food items such as namkeen, chips, bakery items, aerated soda and salty biscuits and fast food includes local fried food items like samosa, chola bhatura, chola kulcha, puri sabji, aloo kachori, kadi chawal, besan pakode, momos, paties and paranthe. The above-mentioned food items are being served by foreign players as well as domestic players. The foreign players include Mcdonald's, Kentucky Fried Chicken (KFC), Pizza Hut, Dominos, Subway, Taco Bell, Coca Cola and Barista. On the other hand, domestic players include Nirula's, Pizza corner, Cafe Coffee Day (CCD), Haldiram and Bikanerwala.

Table 02: Composition of different 'ready-to-eat-food'

Sample name	Total carbohydrate (g/100 or %)	Salt (g/100 or %)	Total fats (g/100 or %)	Trans fats (g/100 g of food)
Potato chips	57.5	2.3	32.8	0.8
Indian snacks	49.9	2.5	35.9	1.6
Instant noodles	71.6	3.7	14.1	0.6
Carbonated drinks	14.4	--	--	--
Burgers	38.2	1.5	11.9	0.4
Pizza	50.3	1.0	7.1	0.1
Fries	56.5	0.4	19.9	16
Fried Chicken	14.0	0.9	23.4	0.7

Source: Food as toxins (2010), Centre for science and environment, New Delhi, India.

Figure 05: Current Food Environment in Urban India



Source: Developed and prepared by author based on perception survey and literature review.

Current scenario (Table 03 and Table 04) of food environment is analyzed in seven major states viz. Andhra Pradesh, Madhya Pradesh, Kerala, Uttarakhand, Mizoram, Maharashtra and Tamil Nadu. The scenario involves the study of food choices in rural and urban areas of the above-mentioned states of India. The data reveals that scenario in urban areas is much worse as compared to rural areas. Further, people have opted for local fried food and chips /namkeen both in urban and rural areas. The overall comparison between urban and rural areas show that consumption is double in urban areas as compared to rural areas. The scenario of healthy food choices is low both in rural and urban areas of the above-mentioned states of India. The overall comparison shows that there was marginal difference between the people of rural and urban areas which opted healthy food choices.

Food Environment in the Light of Nutrition Index (1994) and India State Hunger Index (2008) in Urban India

In India, food environment is highly determined by the economic affordability of people. Poor purchasing power of people living in squatter settlements and JJ clusters compel people to choose unhealthy and non-nutritious food as 'belly filling' diet. Such 'belly filling' diets result in either conditions of 'food desert' or 'food swamps'. Now, states of India which had acquired lower ranks in ISHI, 2008 can be categorized under the conditions of either 'food desert' or 'food swamps'. On the other hand, states of India acquiring higher positions in ISHI 2008 (figure 6) can be categorized under the conditions of 'obesogenic environment'. Nutrition Index, 1994 (figure 6) helps to put Indian States under the various categories of food environments in much better way. The low nutrition score shows that people are feeding on 'belly filling' diet and consequently, suffering from chronic diseases, malnutrition and skinny body. On the other hand, high nutrition score shows that people have 'healthy food environment' with healthy food choices available in their surroundings.

Table 03: Consumption Levels of ‘Ready-to-Eat-Food’ in Urban Areas and Rural Areas of Major States of India

Description	Andhra Pradesh		Madhya Pradesh		Kerala		Uttarakhand		Mizoram		Maharashtra		Tamil Nadu	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Food Choices														
Local fried food	20.2	12.5	30.7	16.1	28.1	27.7	17.7	12.0	9.9	7.7	30.3	11.7	28.2	21.6
Aerated soda	9.6	7.5	8.3	9.9	7.4	7.7	9.5	3.7	4.7	0.9	10.9	5.7	6.8	6.4
Sweetened drinks	11.6	3.5	1.8	0.2	15.9	15.4	13.9	8.7	4.3	6.2	12.0	27.6	5.0	3.2
Pizza/burger/ French fries etc.	3.2	0.9	2.4	1.1	1.5	1.8	3.1	0.4	4.3	1.5	7.2	1.0	1.1	0.5
Cakes/pastries/ bakery items	7.2	1.7	12.8	3.1	16.8	16.4	4.3	0.7	30.3	13.3	16.0	16.8	13.4	7.1
Chips/namkeen	24.2	15.4	29.3	16.4	25.8	23.8	41.9	32.7	9.7	4.4	22.6	8.2	20.6	14.9
Total	76.00	41.5	85.3	46.8	95.5	92.8	90.4	58.2	57.9	34.00	99.00	56.00	69.1	53.7

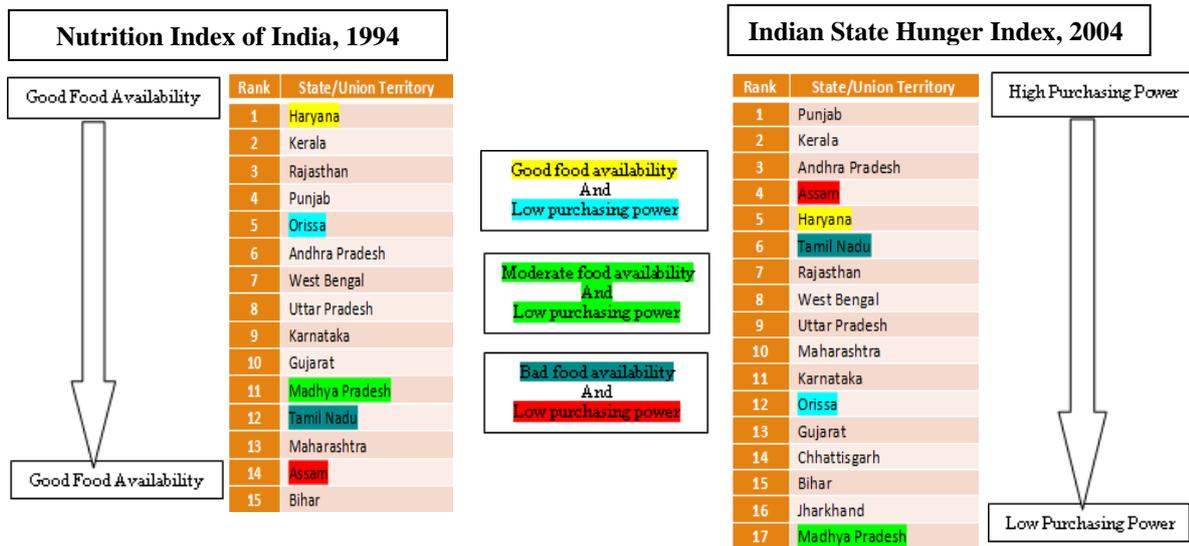
Source: Centre for science and environment, New Delhi, India

Table 04: Consumption Levels of ‘Fruits and vegetables’ in Urban Areas and Rural areas of Major States of India

Description	Andhra Pradesh		Madhya Pradesh		Kerala		Tamil Nadu		Maharashtra		Mizoram		Uttarakhand	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Food Choices														
Fruits	2.5	1.6	2.4	1.3	3.1	2.9	2.5	1.5	2.5	2.0	2.4	2.1	3.3	2.2
Vegetables	5.0	4.9	5.3	4.3	5.4	5.5	5.0	4.6	3.7	3.7	6.8	6.8	5.9	5.1
Total	7.5	6.5	7.7	5.6	8.5	8.4	7.5	6.1	6.2	5.7	9.2	8.9	9.2	7.3

Source: Centre for science and environment, New Delhi, India

Figure 06: Tools to Measure Hunger and Nutrition in India

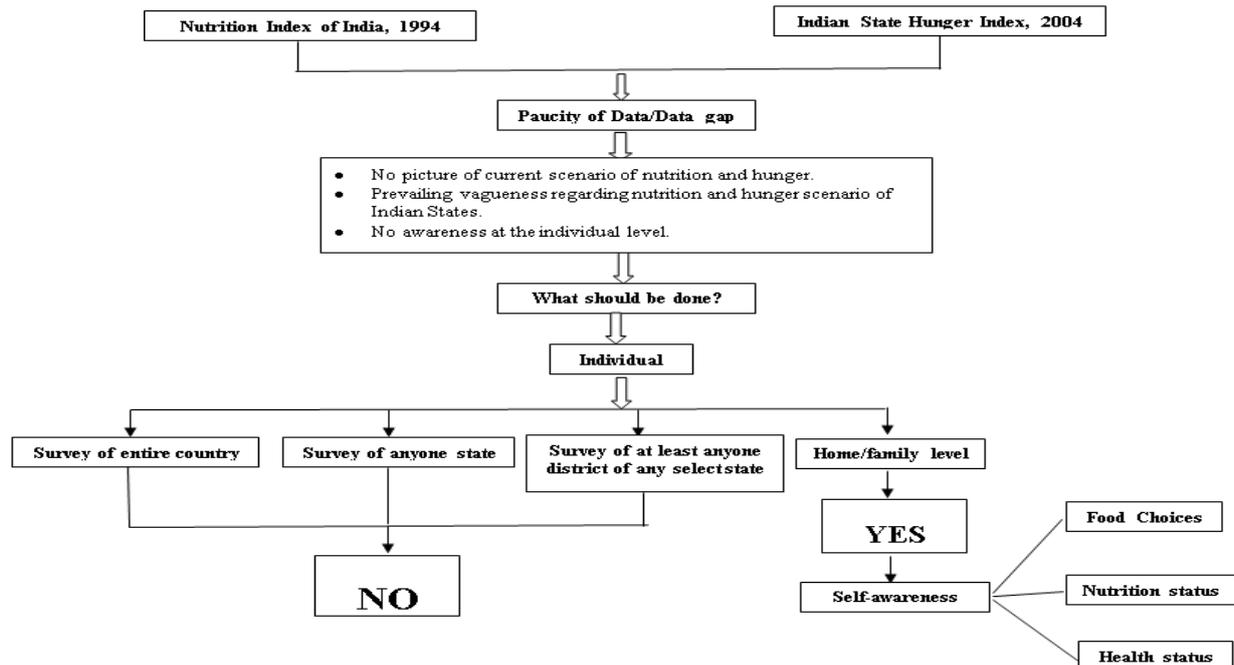


Source: Menon, Purnima et.al. (2009). India State Hunger Index Comparisons of Hunger Across States, Washington, D.C. and www.indiastat.com

Self-Awareness at Individual Level for Healthy Life

Currently, no clear picture of nutrition and hunger scenario is available due to non-release of survey reports as it was done in the year 1994 (nutrition index) and 2008 (Indian State Hunger Index). This prevailing vagueness have raised questions like ‘what should be done to improve nutrition and hunger scenario?’ and ‘what should be the level of execution?’ The fact which we all need to understand over here is that health is for oneself and so it becomes duty of an individual to look after it. We need not to look towards government for everything and every time. But individual too have limitations and cannot involve themselves in survey work (micro, meso and macro level) and so best suited thing is to begin with one’s family and home. Individual can opt healthy food choices, maintain their nutrition status and attain good health status. Likewise, the scenario of entire society will change and attain status of healthy food environment (figure 07).

Figure 07: Promotion of Self-Awareness at The Individual Level for Healthy Lifestyle



Source: Developed and prepared by author

Conclusion

The uneven scenario of hunger, nutrition and economic affordability shows that there is need of urgent steps to strengthen agriculture, improve overall food availability, and provisions to strengthen accessibility to healthy food choices. Further, major focus should be on eradicating malnutrition among children and making provisions to improve the current scenario of child nutrition. Last but not the least, government should revive 'Nutritional index' and 'Hunger Index' as it was done in 1994 and 2008 respectively. The revival of such indices will help in assessing the picture of India in terms of surplus/deficit nutrition zones and also state-wise hunger scenario.

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