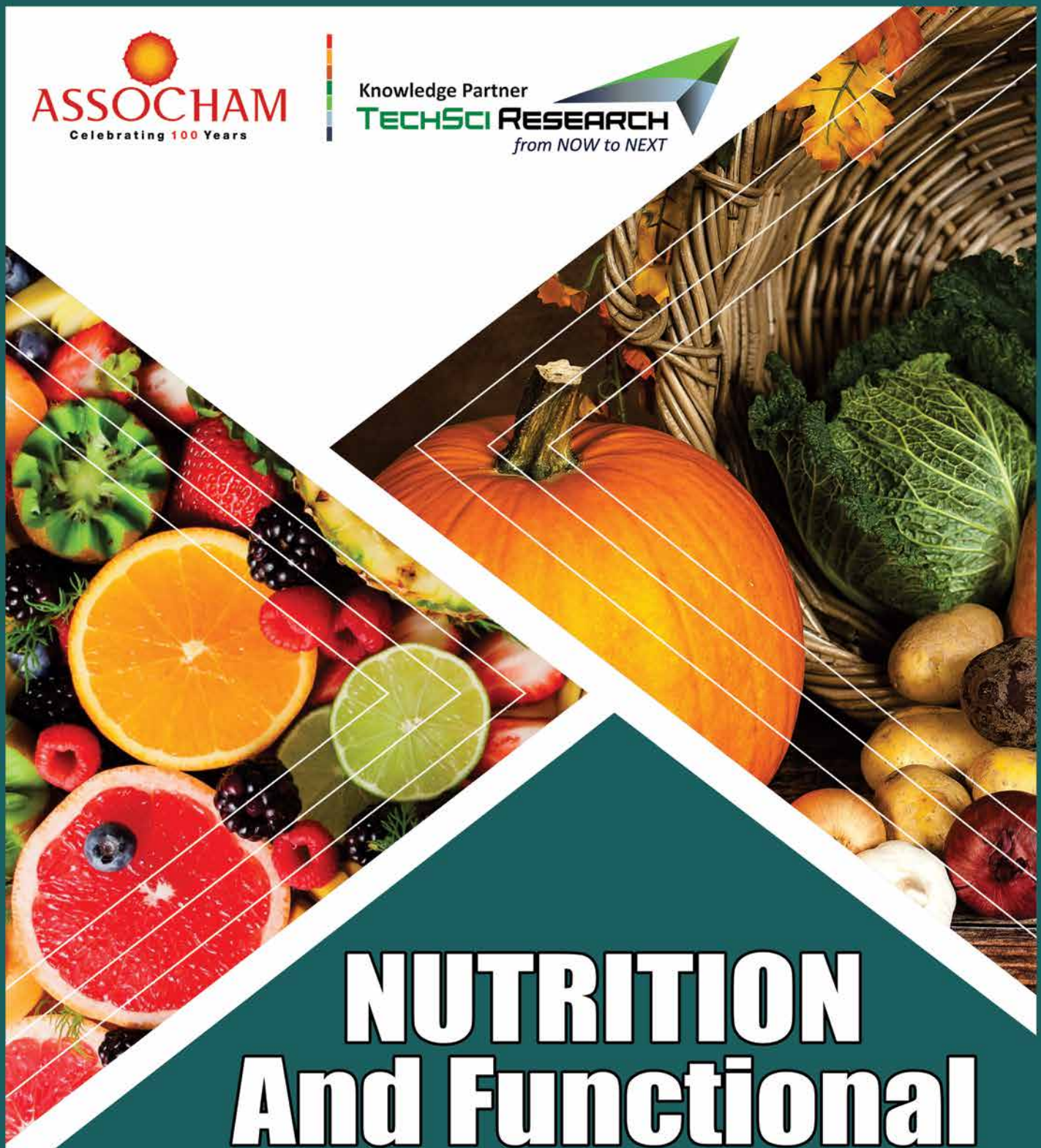
ASSOCHAM
Celebrating 100 Years

Knowledge Partner
TECHSCI RESEARCH
from NOW to NEXT



NUTRITION And Functional Foods

Fortification, Food Security & Supply Chain

March, 2020

MESSAGE

Good health and wellbeing are the priority areas for the sustainable development goals by United Nation and food plays an important role in achieving this. With the current increase in lifestyle disorders around the world, it is therefore important to focus on promotion of food that provides the required nutrition at all ages of life.

India being one of the world's fastest growing economies and despite the Government running number of programs the nutritional status of our children doesn't suggest the same. Indian children are dealing with one of the world's worst levels of malnutrition. A nation with abundance of natural resources, a rich culinary culture and tradition suffers from the nutritional deficiencies which are the most widespread cause of health problem. The statistics reveal that India is bearing the double burden of under-nutrition and over-nutrition at the same time.

There are a number of factors responsible for the inadequate nutrition in the nation which includes unavailability of food usually seen amongst the poor, fad diets which desperate-to-lose-weight people adopt without realizing the consequences that these type of diets do more harm than good and the replacement of healthy food with high carb and fat diet prevalent amongst the urban population.

To overcome such hurdles the Government has taken up a number of initiatives like POSHAN Abhiyaan which is our Hon'ble Prime Ministers vision to achieve holistic nutrition, Mid-day meal scheme that aims to improve the nutritional status of students in government and government aided schools and Integrated Child Development Services (ICDS) Scheme with the objective to improve nutritional and health status of children in the age-group 0-6 years.

Food fortification has also been identified by the World Health Organization as one of the four top strategies to combat micronutrient malnutrition. Private stakeholders are also joining hands with government in this battle to fight malnutrition provide food as well as the nutritional security. Availability of nutritious foods at low cost should be ensured by policy makers, mobilizing community and health education.

ASSOCHAM along with TechSci Research has prepared this knowledge paper with the objective of outlining factors which would provide impetus to the stakeholders for a better understanding about the growth prospects of ensuring food as well as nutritional security in India.

I sincerely hope that this report will be useful to all the industrial stakeholders, consumers, aggregators, service providers, government agencies and consultation agencies and will help in fostering informed debate.

I extend my best wishes for the success of the conference.

Niranjan Hiranandani
President
ASSOCHAM

MESSAGE

Health is a comprehensive concept that represents a state of physical, mental and social well-being, and not just the absence of disease. This makes nutrition an important input for health and development.

India is among the fastest-growing, with a rising population as well. Though the country has progressed positively on several health outcomes, the current state of food and nutrition security demands more focus.

The unique scenario of many people still living in poverty and the increasing economic growth, has led to the co-emergence of two types of malnutrition in the country: under-nutrition and over-nutrition. This makes the current situation of India a double-edged sword.

The Government of India has undertaken various initiatives to improve delivery on nutrition and food security targets. The launch of ambitious schemes such as the National Food Security Act, the National Nutrition Strategy and the National Nutrition Mission, which have the aim of promoting nutritional security in India, is apt for the scenario. These initiatives have the potential to reach their targets under Sustainable Development Goal 2, which aims to 'End hunger, achieve food security and improved nutrition and promote sustainable agriculture'.

The Public Distribution System (PDS) has provided a critical nutritional supplement to the people across all states in India. It ensures coverage to the bottom of the pyramid as well, providing them opportunity to buy the basic staples like rice and wheat at a low-cost. Despite the success of PDS, India ranks low (102nd rank among 117 countries) in the Global Hunger Index, with significant pressure among infants and children under five years of age.

This report is an attempt to initiate efforts and discussions on the key performance indicators of food and nutritional security in India.

ASSOCHAM, along with TechSci Research, has prepared this report highlighting the ways to support the government initiatives and achieving the sustainable development goals.

I hope that the stakeholders will find the paper relevant and the views expressed therein will help in improving the understating about the food and nutritional security in India.

Deepak Sood
Secretary General
ASSOCHAM

CONTENT

1. EXECUTIVE SUMMARY

Malnutrition is among the major challenges being faced by developing countries. If we talk about India in terms of hunger rankings, as per the Global Hunger Index 2019, which includes the indicators like underweight, undernourishment, mortality rate, stunted children and child wasting, the country has slipped from 95th rank in 2010 to 102nd rank in 2019. Keeping in mind the issue of deficiency levels, the government is increasingly focusing on fortification in order to control the health issues related to a micro-nutrient deficiency in India.

This report provides deep insights and actionable data related to food fortification and nutritional requirements in counter malnutrition in India. It also highlights the problems and provides information about the various policies initiated by the government of India to control health hazards emanating from malnutrition in the country.

Fortification is the process of adding micronutrients into food (regular consumable) which aren't already present in them. Food fortification is being worked out as a strategy for improving public health in India. Food Fortification Resource Centre in India was established under the Food Safety and Standards Authority of India (FSSAI) in October 2016, with its main goal being the promotion of large-scale fortification of food. In India, fortification is already been introduced for the Rice, Wheat, Edible oil, Milk and Salt.

In 2019, the government approved a centre-sponsored pilot scheme on "Fortification of Rice and its Distribution under Public Distribution System". Also, the government is providing fortified food through the Mid-Day Meal Scheme and Integrated Child Development Services (ICDS). Leading players such as Britannia Industries Ltd., Nestle India Pvt. Ltd., Mother Dairy Fruit & Vegetable Pvt. Ltd, Adani Wilmar, Cargill India Pvt Ltd, Tata Industries, etc., are also increasing their focus on fortification.

In 2019, researchers of the Massachusetts Institute of Technology developed a new strategy to fortify staple foods with vital nutrients like iron and vitamin A, by encapsulating a biocompatible polymer in them, which can be used to prevent the loss of nutrients during storage and cooking, while facilitating their absorption when the food is consumed. Apart from fortified foods, functional food is claimed to improve health. Functional foods are the foods that have a potentially positive effect on human health apart from basic nutrition.

According to TechSci Research Estimates, the functional food market in India was estimated at around INR 82 billion in 2019 and is estimated to reach around INR195 billion by 2025, exhibiting a CAGR of around 15% during the forecast period. India is still a small functional food market compared to the global functional food market, which was valued at an estimated INR 11,281 billion in 2019. Nevertheless, rising consumer interest and awareness towards the importance of a proper diet is expected to continue boosting the functional food market in India over the course of next 5-10 years.

2. INTRODUCTION

Nutrition and Functional Food is a typical food with specific nutrients added to it, for example, vitamins or minerals, fibre, or probiotics or prebiotics. Functional food are meant to fulfil nutritional deficiencies.

According to the Food and Drug Administration (FDA), there is no official definition for functional foods. The Academy of Nutrition and Dietetics define functional foods as "whole foods along with fortified, enriched or enhanced foods that have a potentially beneficial effect o n health when consumed as part of a varied diet on regular basis at effective levels based on significant standards of evidence."

Classification of Functional Foods:

A. Based on Nature

i. **Conventional functional foods :** Conventional functional foods are the foods that haven't been modified by enrichment or fortification process.

Table 1: Conventional Functional Foods

Category	Examples
Fruits	Berries, kiwi, pears, peaches, apples, oranges, bananas
Vegetables	Broccoli, cauliflower, kale, spinach, zucchini
Nuts	Almonds, cashews, pistachios, macadamia nuts, Brazil nuts
Seeds	Chia seeds, flax seeds, hemp seeds, pumpkin seeds
Legumes	Black beans, chickpeas, navy beans, lentils
Whole grains	Oats, barley, buckwheat, brown rice, couscous
Seafood	Salmon, sardines, anchovies, mackerel, cod
Fermented foods	Tempeh, kombucha, kimchi, kefir, sauerkraut
Herbs and spices	Turmeric, cinnamon, ginger, cayenne pepper
Beverages	Coffee, green tea, black tea

ii. **Modified functional foods :** Modified functional foods are the processed foods which requires the addition of the Vitamins, Minerals, etc., in order to make them functional.

Table 2: Modified Functional Foods

Category	Examples
Fortified	Juices
	Dairy products, such as milk and yoghurt
	Milk alternatives, such as almond, rice, coconut, and cashew milk
	Grains, such as bread and pasta
	Cereal and granola
	Fortified eggs

B. Based on Origin

1. Plant origin-The one which has been obtained by the plants.
2. Animal Origin-The one which has been obtained by the animals.

Top 10 Current Global Food Science Research Countries include China, United States, Brazil, Italy, Spain, South Korea, Germany, India, United Kingdom and Australia.

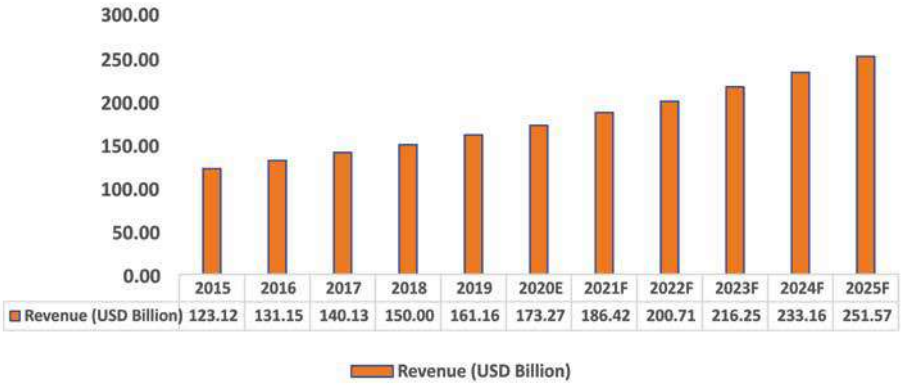
Functional Food Ingredients:

Functional food is the combination of the functional food ingredients, which includes Carotenoids, Dietary Fibers, Fatty Acids, Minerals, Prebiotics & Probiotics, Vitamins and others. Functional food is often used for Sports Nutrition, Weight Management, Immunity, Digestive Health, Clinical Nutrition, Cardio Health and other activities.

2.1 Global Scenario

The global functional food market was estimated to be approximately INR 11281.20 billion in 2019. It is projected to reach around INR 17610.16 billion by 2025, majorly driven by growing concerns towards health coupled with increasing awareness about functional food.

Graph 1: Estimated Global Functional Food Market (USD Billion)

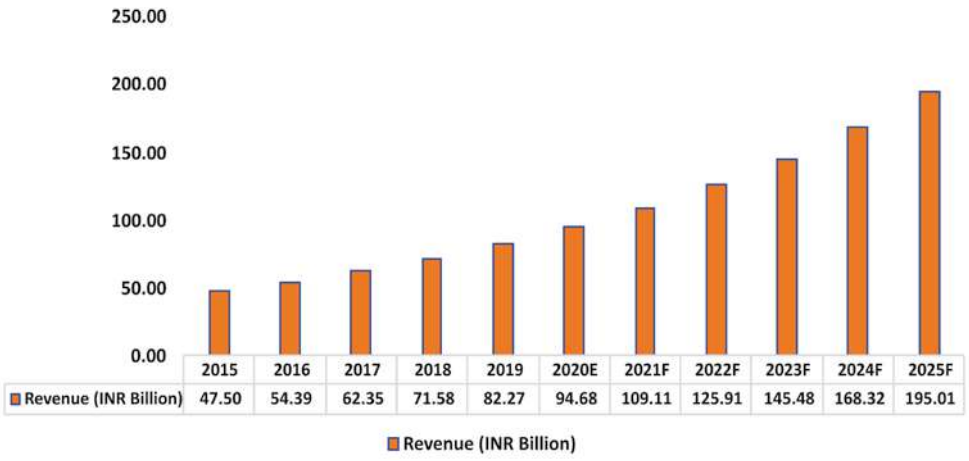


Increasing prevalence of chronic diseases is one of the major reasons owing to which consumers are giving preference to healthier foods. Also, increasing consumer interest and awareness towards the importance of the proper diet are other factors driving the global functional foods market. Japan, Europe and the United States have the largest consumer bases in terms of functional food consumers.

2.2 Indian Scenario

The functional food market in India was estimated at around INR 82 billion in 2019 and it is projected to reach INR195 billion by 2025, which is due to increasing health awareness among younger generation.

Graph 2: Estimated India Functional Food Market (INR Billion)

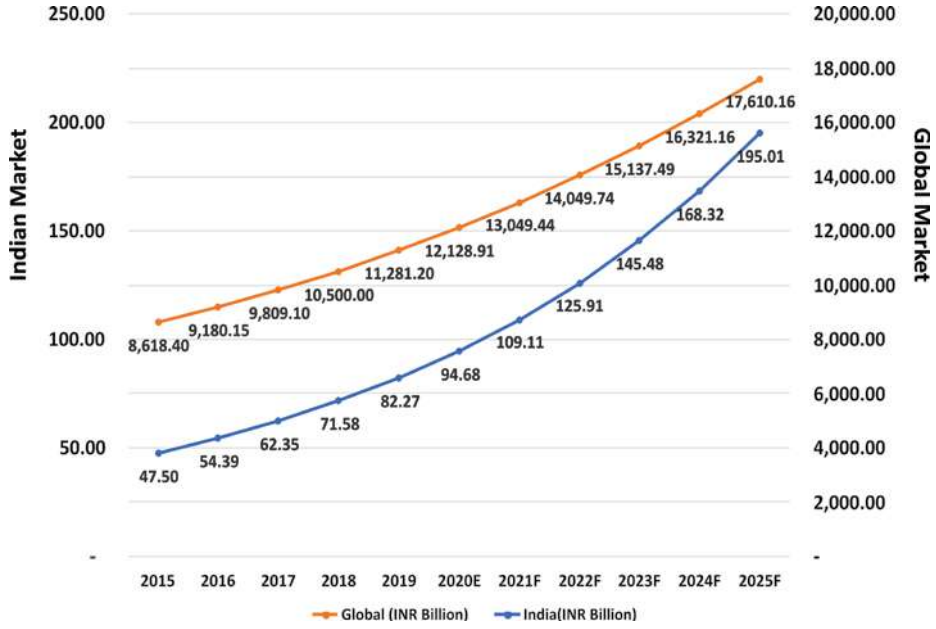


Indian consumers are increasingly focusing on being healthy. Consequently, they are focusing on increasing their awareness of the importance of functional food. Generation Z and X are the biggest consumers segments for functional food products in India.

Comparison of Global and India Functional Food Markets

Indian functional food market is relatively small (less than 1%) in comparison to the global functional food market, however, it is expected to grow at a rapid pace in the coming years. Leading players operating in the global functional food market include Unilever, Sanitarium Health & Wellbeing Company, PepsiCo Inc., Ocean Spray Cranberries Inc., Nestlé, among others.

Graph 3 : Comparison Global vs. Indian Functional Food Markets

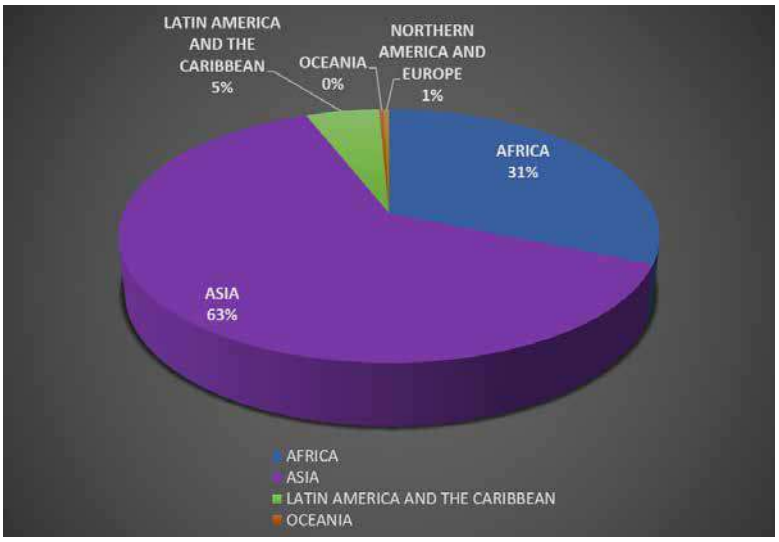


Source: TechSci Research Estimates

Japan, Europe and the United States are among the largest consumers of the functional food, primarily owing to high product availability and a higher degree of awareness among consumers in comparison to the other countries.

Undernourishment is one of the reasons that is making an increasing number the governments inline towards fortification. It has been accepted by many countries in order to tackle the issue of nutritional deficiencies.

Graph 4: Undernourished Region Wise Share (%)



3. FOOD FORTIFICATION IN INDIA

Food Fortification Global and India Origin Overview:

Many countries have taken part in food fortification over the years by understanding the deficiencies at the nutritional level of their population. Switzerland and the United States were the first to initiate fortification while India started the same way back in 1950.

Table 3: Countries Implementing Fortification of Food Ingredients

Food Ingredients	Countries
Mandatory salt iodization fortification	**Switzerland and the US**
Mandatory fortification of flour including Vitamin B1	**Canada**
Fortification of cereal products with Vitamin B1, B2 and B3	**US**
Flour fortified including vitamins B and iron	**Chile**
Sugar fortification with Vitamin A	**Guatemala**
Wheat and maize flour fortification	**Venezuela**
Folic Acid fortification becomes Mandatory	**US**
Mandatory fortification	**Africa – Nigeria**
Made mandatory fortification of wheat flour, maize, brown and white bread	**South Africa**
Compulsory fortification of Vanaspati Including Vitamin A	**India**
Salt Iodization added in National Program	**India**

Staple food (includes wheat, maize, rice, etc.) is mostly used as a regular food by the majority of the population. Frequent consumption makes the staple food as an excellent product for the fortification around the world. Worldwide demand for maize, rice and wheat is projected to increase 33 percent by 2050.

What is Fortification?

Picture 1: Fortification Logo India

Food fortification is the process of adding the micronutrients which are not present in the food. Food Safety and Standards Authority of India (FSSAI) takes care of the food fortification under the Fortification Resource Centre. It has provided the logo for the fortified food, "+F', which is used in staples such as rice, wheat flour, salt, edible oil, and milk.

History of Fortification in India:

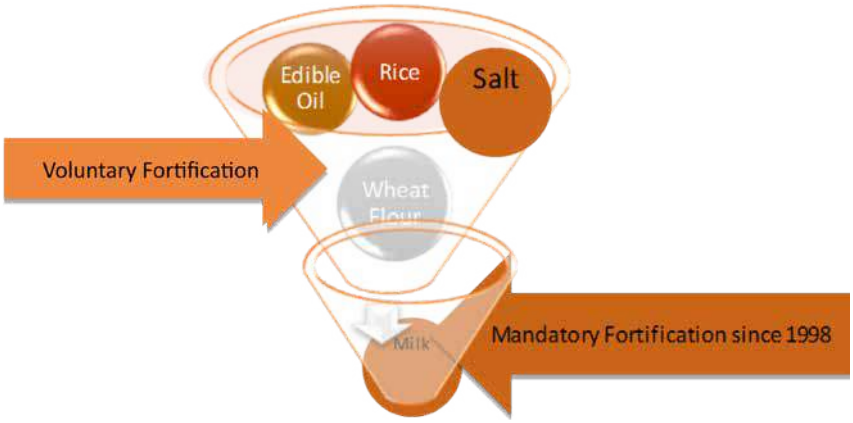
Food fortification in India started when Vitamin A fortification was carried out in Vanaspati. In 1986, the National Universal Salt Idolization was adopted to prohibit the sales of non-iodized salt in India, which was carried out at both the national and states levels.

National Nutrition Policy:

- National Nutrition Policy in India was first adopted in 1963 to be implemented on the various areas to fight undernutrition in the country.
- The strategy adopted under the National Nutrition Policy is to eradicate the problem of undernutrition through the direct nutritional intervention for the vulnerable groups in India.
- Direct short-term nutrition intervention covers the following areas:
    1. Vulnerable groups, children below 6 years, adolescent girls and pregnant and lactating women.
    2. Fortification of the food (rice, wheat, edible oil, milk and salt) with the required amount of nutrition level.
    3. Quality check of micronutrient deficiencies in fortified food.
    4. To make available the low-cost fortified food for the needed group as they have the highest deficiencies level.
- The indirect long-term goal for the food fortification in India:
    1. Improvement of dietary patterns, food security and strengthening the public distribution system for the rural and urban poor to provide them fortified food.
    2. Taking care for the nutritional impact in India, research on the various deficiencies present in the population.

Fortification Types:

Picture 2: Fortification Types



Fortification is either Voluntary or Mandatory : In India, edible oil, rice, milk and wheat are voluntary fortification products and Salt comes under mandatory fortification category. The other type of classification of fortification includes Mass fortification, Targeted fortification and Market-driven fortification.

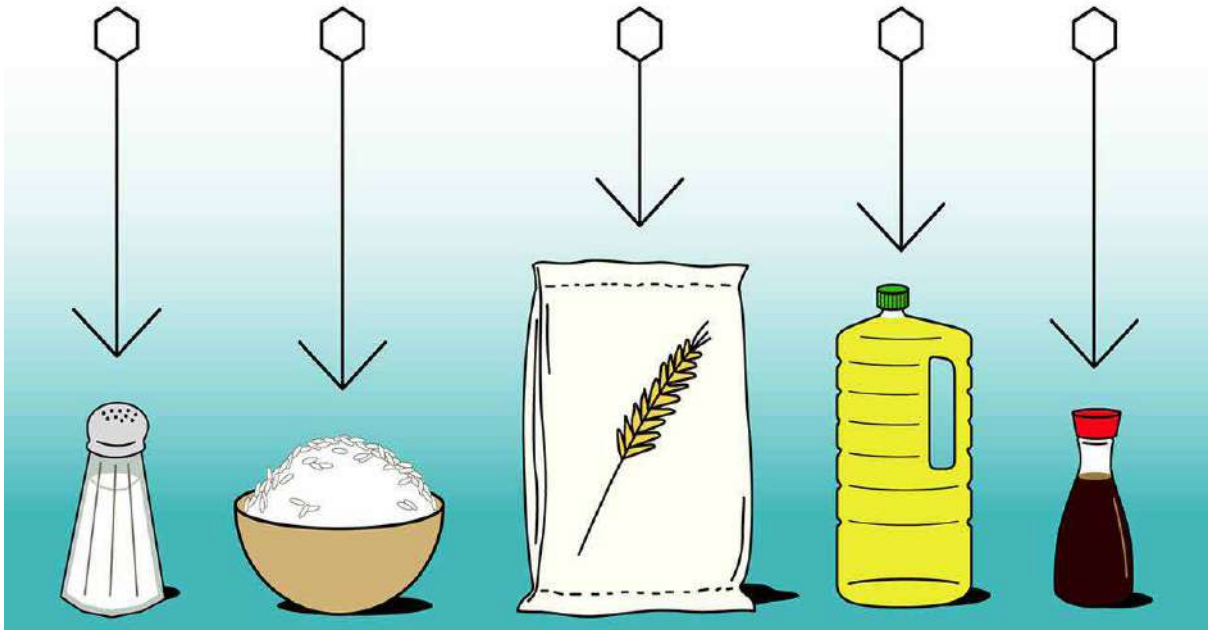


Table 4: Micronutrient Level Claims

Cost	Oil	Milk	Wheat	Rice	Double Fortified Salt
Cost in INR (paise / kg)	44116.00	< 2	44053.00	30-40	200-300
Cost in USD (cents/kg)	0.15 - 0.19	0.031	0.12 - 0.15	0.46 - 0.62	3.09 - 4.64
Annual per capita consumption (kg / person)	12-18	123	60 (ranges widely by state)	70 (ranges widely by state)	2.56-3.29
Annual cost (cents/ beneficiary)	1.8 – 3.4	3.8	7.2 – 9.0	32.2 - 43.4	7.9 – 15.3
Max dose delivered	~25-30% RDA vitamins A and D		~33% RDA of included micronutrients**	~38% RDA of included micronutrients**	30-60% EAR of iron, 100% EAR of Iodine
Micronutrients possible to include in food vehicle	Vitamins A and D	Vitamins A and D	Iron; vitamins A, B1, B2, B6, B9, B12;* Niacin, Zinc	Iron; vitamins A, B1, B2, B6, B9, B12;* Niacin, Zinc	Iodine, Iron

The following Micronutrient used to add up for the fortification of the staples in India as per the deficiency level present.

Table 5: Wheat Flour Fortification Standard In India

Nutrients	Standard Quantity
Iron	35.25 mg/kg
Vitamin B6	2.00 mg/kg
Vitamin B12	0.00 mg/kg
Zinc	12.50 mg/kg
Niacin (B3)	16.25 mg/kg
Folate (B9)	0.10 mg/kg
Vitamin A	0.63 mg/kg
Thiamin (B1)	1.25 mg/kg
Riboflavin (B2)	1.50 mg/kg

Source: Ministry of Health and Family Welfare, Food Safety and Standards Authority of India. The Gazette of India, Extraordinary, Part III - Section 4, Food Safety and Standards (Fortification of Foods) Regulations, 2018, No 290, REGD. No. D. L. - 33004/99. India. 3/August/2018.

Table 6: Rice Fortification Standard In India

Nutrients	Standard Quantity
Vitamin B12	0.00 mg/kg
Folate (B9)	0.10 mg/kg
Vitamin A	0.63 mg/kg
Thiamin (B1)	1.25 mg/kg
Riboflavin (B2)	1.50 mg/kg
Vitamin B6	2.75 mg/kg
Zinc	12.50 mg/kg
Niacin (B3)	16.25 mg/kg
Iron	35.25 mg/kg

Source: Ministry of Health and Family Welfare, Food Safety and Standards Authority of India. The Gazette of India, Extraordinary, Part III - Section 4, Food Safety and Standards (Fortification of Foods) Regulations, 2018, No 290, REGD. No. D. L. - 33004/99. India. 3/August/2018.

Table 7: Milk Fortification Standard In India

Nutrients	Standard Quantity
Vitamin A	270 µg RE - 450 µg RE per litre
Vitamin D	5 µg -7.5 µg per litre

Production statics for India for the major staples used on a daily basis which can be fortified in order to improve the deficiency levels have been shown in the below table.

Table 8: Key Statistics of Staples Production In India (2015-2018)

Area, Production and Yield of Major Crops								
Crops	Area (Lakh hectare)			Production (Million Metric Tonnes)		Yield (kg/hectare)		
	2015-16	2016-17	2017-18	2016-17	2017-18	2015-16	2016-17	2017-18
Rice	434.99	439.93	437.89	109.7	112.91	2400	2494	2578
Wheat	304.18	307.85	295.76	98.51	99.7	3034	3200	3371
Nutri / Coarse	243.89	250.08	242.05	43.77	46.99	1579	1750	1941
Pulses	249.12	294.45	299.93	23.13	25.23	655	786	841
Foodgrains	1232.18	1292.31	1275.63	275.11	284.83	2041	2129	2233
Oilseeds	260.87	261.77	246.45	31.28	31.31	968	1195	1270
Sugarcane	49.27	44.36	47.32	306.07	376.9	70720	69001	79650

Source: Agricultural Statistics Division

Wheat Fortification

Wheat is one of the highest per capita consumable staples in India which has been fortified with iron, folic acid, zinc, and the Vitamin B as per FSSAI provided standards to tackle the nutritional deficiencies in India. The cost of fortifying wheat is approximately 7 to 8 paise per/kg. On the global level, wheat flour fortification was started in 1942 after which 82 countries made it mandatory. Wheat fortification started in India in 2000.

Graph 5: Wheat Production and Consumption In India (2010-2018)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Production	86874	94882	93506	95850	86527	87000	98510	99870	102190
Consumption	81408	83824	93848	93102	88548	97234	95677	95629	98000

www.indexmundi.com

As only 30% of the wheat market is organized and rest is unorganized, the market is dominated by the unorganized sector. The unorganized sector is driven by local chakki mills. The organized sector is dominated by a few major players which are around 5%. There are around 500 regional brands, 1,500 roller flour mills, 1,472 commercial chakki mills, and 376,803 local chakkis in India. Major packaged wheat flour companies such as ITC, General Mills Patanjali, HUL, Harmony Foods, Nav Bharat, etc., have started fortification as per FSSAI.

Picture 3: Brands As Per The FSSAI Standards Of Fortification

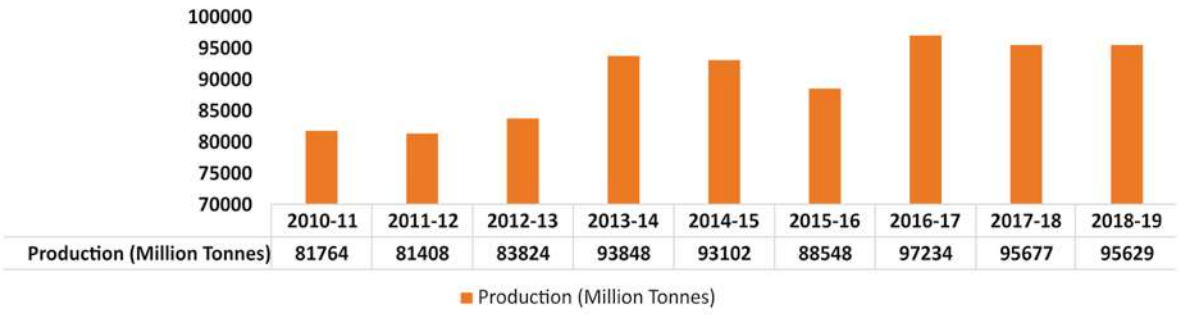
Table 9: Statewise Availability of Fortified Wheat Flour

Fortified Staple	Company Name	Brand Name	States
Wheat Flour	Harmony Foods Pvt. Ltd.	Harmony Chakki Fresh Atta	Andhra Pradesh and Tamil Nadu
	Kumar Chakki	Kumar Chakki Atta	Haryana
	NavBharat Flour Mills	Vitamin Plus	Jammu and Kashmir
	General Mills Pvt Ltd.	Pilsburry	Gujarat
	Jagganath Rice Mill	Risshta Atta	Odisha
	Misha Agri Indus- tries	Energetic	Gujarat, MP and Maha- rashtra
	ITC	Aashirwad Atta	Delhi

Milk Fortification

In the country's organized dairy market, private players account for nearly 55 % of the market share. The share of unorganized sector in India's dairy market stands at around 25%.

Graph 6: Milk Production In India (2010-2019)



National Dairy Development Board

Table 10: Some Dairy Players Who Are Currently Fortifying Milk As Per FSSAI Standards

Dairy Cooperatives	Private Dairies
Chhattisgarh State Co -Operative Marketing Federation Ltd. Devbhog	Britannia Industries Ltd.
Delhi Milk Scheme (DMS) DMS	Creamline Dairy Products Ltd.
Haryana Dairy Development Cooperative Federation Ltd. Vita	Dairy power Ltd.
Jharkhand State Cooperative Milk Producers Federation Ltd. Medha	Goma Foods Pvt. Ltd.
Maahi Milk Producer Company Ltd. Maahi	Heritage Foods Ltd.
Madhya Pradesh State Cooperative Dairy Federation Ltd. Sanchi	Kwality Ltd.
Mother Dairy Fruit & Vegetable Pvt. Ltd. Mother Dairy	Milky Moo PAN
Odisha State Cooperative Milk Producers' Federation Ltd. OMFED	Nestle India Pvt. Ltd.
Punjab State Cooperative Milk Producers Federation Ltd. Verka	Uttar Pradesh Pradeshik Cooperative Dairy Federation Ltd.
Rajasthan Cooperative Dairy Federation Ltd. Saras	Sunfresh Agro Industries Pvt. Ltd.
West Assam Milk Producers' Cooperative Union Ltd. Purabi	Prabhat Dairy Uttar
Uttarakhand State Dairy Coop. Federation Ltd.	VRS Foods Pvt. Ltd.
Bihar State Milk Co-operative Federation Ltd. Sudha	

Picture 4: Brands As Per The FSSAI Standards Of Fortification

Edible Oil Fortification:

Oil fortification globally was introduced in 1965 and 27 countries mandated it. In India, edible oil is fortified with Vitamin D and Vitamin A. Around 40% oil in the country is being used for the direct consumption, with the remaining being used for the institutional purpose, which includes the bakery and the processed food preparation. The cost for the fortification of the Edible Oil is 10 paise per/kg.

Table 11: Oil Fortification Standard In India

Nutrients	Standard Quantity
Vitamin D	0.14 mg/kg
Vitamin A	7.95 mg/kg

Source: Ministry of Health and Family Welfare, Food Safety and Standards Authority of India. The Gazette of India, Extraordinary, Part III - Section 4, Food Safety and Standards (Fortification of Foods) Regulations, 2018, No 290, REGD. No. D. L. – 33004

Total edible oil available for domestic consumption was 21.77 million tonnes in 2019. Per capita consumption has increased from 4 kg to 7 kg per year in rural India and in urban India, it has increased to 6.6 kg to 10 kg per year. All this making the penetration of the consumption of edible oil around 99% in Indian households.

Table 12: Statewise Availability of Fortified Oil In India

Fortified Staple	Company Name	Brand Name	States
Edible Oil	ADM	Parampara, HealthFit	Maharashtra, Karnataka, Rajasthan, U.P
	AAK Kamani	Jawan, Komal, Klassic	Pan India
	Adani Wilmar	Fortune, King, Aadhar, Bullet, Raag Gold, Alpha	Pan India
	Bunge India Pvt Ltd.	Dalda, Gagan, Ginni, Chambal, Lotus, Lily, Rica Primor, Coco Rica, Golden Fry	Pan India
	Cargill India Pvt Ltd	Sweekar, Nature Fresh, Gemini, Shubh	Pan India
	Marico Ltd	Saffola Active, Saffola Gold, Saffola Total, Saffola Tasty	Pan India
	Mother Dairy	Dhara, Lokdhara	Pan India
	Kaleesuwari Refinery Private Limited	Gold Winner	Tamilnadu, Kerala, Karnataka, Andhra Pradesh, Maharashtra, Odisha
	B. L. Agro Oils Ltd.	Bail Kolhu, Krishan, K.Jyoti, Khiladi, Garib Rath, Vatika, Nourish, Mohandhara	North East, U.P (East), Uttara-khand, Delhi- NCR

Table 13: Edible Oils Production and Consumption In India (2017-19)

(In Million Tonnes)	2017-18	2018-19
Production	10.38	10.06
Domestic Consumption	24.13	24.23

Source DSVO

Picture 5: Major Brands of Fortified Oil In India

Salt Fortification:

Per day consumption of the salt in India is 7 to 9/g per person. Fortification of the salt with the iodine had started in India since 1962. It has significantly reduced the deficiency of Iodine in India. Again, the fortification of the iodized salt with the iron is the initiative of the double fortified salt (DFS). Through government-initiated programs, DFS has the potential to reach 150 to 180 million people and most of the vulnerable sections of the population.

Yearly salt production in India was 28.94 Million Tonnes in 2018, out of which 6.4 Million Tonnes was used for edible consumption purpose. There are around 11,800 salt producers in India, spread over 8 states. About 95% are small manufacturers who produce about 40% of the total salt in India.

Table 14: Salt Fortification Standard In India

Nutrients	Standard Quantity
Iron	975 mg/kg
Iodine	25 mg/kg

Source: Ministry of Health and Family Welfare, Food Safety and Standards Authority of India. The Gazette of India, Extraordinary, Part III - Section 4, Food Safety and Standards (Fortification of Foods) Regulations, 2018, No 290, REGD. No. D. L. - 33004/99. India. 3/August/2018.

In India, 80% of raw salt is used to produce refined/upgraded quality edible salt. Due to the lack of iodine in the soil, there is a risk of iodine deficiency. In 2017, around 92% of the Indian population was consuming iodized salt.

Table 15: Statistics on Salt Production In India

Statistics		2015-16	2016-17	2017-18
Total Area Assigned for Salt Production	**Acres**	610809	647866	646964
	Hectares	244324	259146	2587856
Area Under Salt Production	**Acres**	363343	355313	329711
	Hectares	147102	142125	131884
Production (Lakh Tonnes)				
i) Public Sector		3.62	4.88	4.25
ii) Private Sector		256.78	274.28	273.61
iii) Co-Op. Societies		16.03	12.76	11.63
Total		**276.43**	**291.92**	**289.49**
Distribution (Lakh Tonnes)				
i) Human Consumption:		62.43	64.36	64.69
ii) Export:		65.67	82.75	91.63
iii) Industries:		119.04	115.82	118.11
Total		**247.14**	**262.93**	**274.43**
IODISED SALT (Lakh Tonnes)				
i) Production		44.64	49.37	49.32
a) Refined		20.12	19.74	18.97
b) Non-Refined		64.76	69.11	68.29
Total		**Units**	**No.**	**Capacity**
		Units	454	78.79
No. of Iodization Plants/ Refineries (2017-18)		Plants Refineries	133	146.9
		Total	**587**	**225.69**

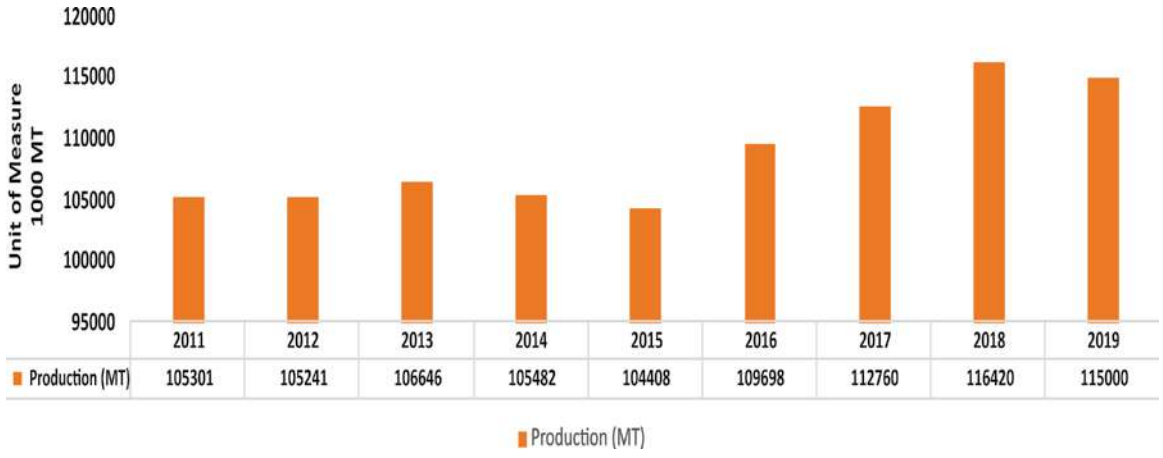
Picture 6: Major Brands of Fortified Salt In India

Rice Fortification:

The use of fortified rice was made mandatory in the midday meal, under the Integrated Child Development Services (ICDS) scheme in India in December 2019.

Rice is one of the staple foods for around 65% population in India. Fortification of rice can help to tackle the deficiencies of Vitamin B12, Folate (B9) Vitamin A, Thiamin (B1), Riboflavin (B2), Vitamin B6m, Zinc, Niacin (B3) and Iron. Around 33.7 million ton of rice has been distributed every year through public funds nationwide.

Graph 7: Milled Rice Production In India (2011-2019)



Picture 7: Fortified Rice Brands In India

Table 16: Fortified Rice Companies and Brands In India

Fortified Staple	Company Name	Brand Name	Availability
Rice	DCP Foods Pvt Ltd	Asbah	Pan India
	LT Foods Pvt Ltd	Daawat Rozana	Pan India

4. FOOD FORTIFICATION IN INDIA

Safety Measures:

The main goal behind the monitoring and evaluation (M&E) of staple food fortification in India is to maintain and check the quality that has been provided. M&E has been divided into three processes that are as follows:

1. Short-term
2. Medium-term
3. Long-term

For all the processes, the government has connected with different private firms for quality check.

Short-term:

- In the short-term, the government ensures availability of staples with food fortification in both the open market and in the government-related schemes.
- Another objective is to maintain the standards FSSAI.
- Open Market Activities includes organizing industry consultations, to prepare technical handbooks for fortification for the companies.

Medium-term

- The medium-term goal is to increase consumer awareness, educate about benefits and increase the availability of fortified foods.
- Establish the communicable way for the food fortification with the corporates and the industry. Initiate campaigns like Safe and Nutritious Food etc.

Long-term

- Over the Long-term, the focus is to change the health scenario in the country by improving micronutrient malnutrition as per the NFHS-5 indicators.

STANDARDS ON FORTIFICATION

A. General Principles

(1) Micronutrients may be appropriately added to foods for the purpose of contributing to any of the following as mentioned in Schedule-I:

(a) Preventing or reducing the risk of, or correcting, a demonstrated deficiency of one or more micronutrients in the population or specific population group.

(b) reducing the risk of, or correcting, inadequate nutritional status of one or more micronutrients in the population or specific population group.

(c) meeting requirements or recommended intake of one or more micronutrients.

(d) maintaining or improving health.

(e) maintaining or improving the nutritional quality of foods.

(2) When fortification of a food is made mandatory, it shall be based on severity and extent of public health need as demonstrated by generally accepted scientific evidence.

(3) The Food Authority may, specify mandatory fortification of any staple food on direction of the Government of India.

(4) Wherever "**Iron (As Fe)**" is used as a source of nutrient, heme iron shall not be used in any form in any article of food.

B. Compliance with Standards on Micronutrient Content in Fortified Food

(1) Any manufacturer who fortifies any food shall ensure that the level of micronutrient in such fortified food does not fall below the minimum level specified in Schedule- I.

GENERAL OBLIGATIONS

A. Quality Assurance

(1) Every manufacturer and packer of fortified food shall give an undertaking on quality assurance and submit evidence of steps taken in this regard to the Food Authority or such other authority which the Food Authority may designate.

(2) The undertaking shall be given twice a year and shall include, the following, namely:-

(a) certification by a food laboratory notified by the Food Authority that the fortified food is in compliance with the provisions of the Act and regulations and standards specified therein;

(b) up-to-date record keeping and continuous inventory of fortificants used in the manufacturing or packing process, including the source of its procurement;

(c) appropriate monitoring procedures at different stages of manufacturing or packing process;

(d) random testing of fortificants and fortified food;

(e) regular audit of technical equipment and processes;

(f) such good manufacturing practices, as may be specified by the Food Authority from time to time.

(g) provisions for the reference of the purity criteria of micronutrients, generally accepted by pharmacopoeias, namely, Indian Pharmacopoeia, British Pharmacopoeia, Food Chemical Codex, Joint Food and Agriculture Organization or World Health Organisation Expert Committee on Food Additives or CODEX Alimentarius may be adopted by food Business operators.

B. Compliance with the generally applicable provisions of the Act, Regulations and Standards

All fortified food, whether voluntarily fortified or required to undergo mandatory fortification shall be manufactured, packed, labeled, handled, distributed and sold, whether for profit or under a Government-funded programme, only in compliance with the standards specified under the provisions of the Act and regulations made thereunder.

C. Packaging and Labeling Requirements

(1) All fortified food shall be packaged in a manner that takes into consideration the nature of the fortificant added and its effect on the shelf life of such food.

(2) Every package of fortified food shall carry the words "fortified with (name of the fortificant)" and the logo, specified in Schedule-II of these regulation, on its label. It may also carry a tag line "Sampoorna Poshan Swasth Jeevan" under the logo.

(3) provisions of the Food Safety and Standards (Packaging and Labeling) Regulations, 2011, shall also apply to the fortified foods.

(4) Every package of food fortified with Iron shall carry a statement "People with Thalassemia may take under medical supervision".

(5) All manufacturers and packers of fortified food complying with the provisions of the Act and rules or regulations made thereunder on fortified food shall be permitted to make a nutrition claim in relation to an article of fortified food under the Food Safety and Standards (Packaging and Labeling) Regulations, 2011.

D. Promotion of Fortified Food

(1) The Food Authority shall take steps to encourage the production, manufacture, distribution, sale and consumption of fortified food including fortification through conventional breeding or hybridization, in co-operation with concerned departments of the Government of India/Government of States/UTs.

(2) Without prejudice to the generality of sub-regulation (1), the Food Authority shall endeavor to:

(a) advise and promote the use of fortified food in Government-funded programmes on distribution of food;

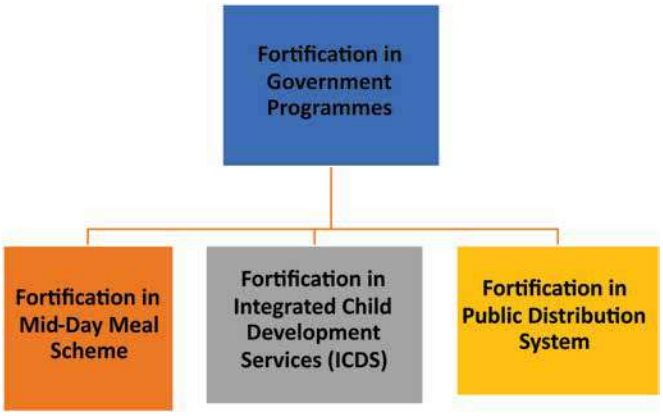
(b) organise public awareness, educate and advocate campaigns on nutrition and fortified food;

(c) conduct technical assistance programmes and provide technical expertise to small manufacturers to enable them to undertake fortification.

(d) equip laboratories and research institutions notified under the Act to conduct the nutrient analysis of fortified food.

4. GOVERNMENT INITIATIVES

Picture 12: Government Initiatives for Fortification



Fortification in Mid-Day Meal Scheme

Government has started the Mid-Day Meal (MDM) Scheme in order to improve the nutritional levels in children for underprivileged class and studying in government-aided school and Aganbadis. As per the government standards, primary school children will be provided 100 grams of grains and apart from that other school children will be provided 150 grams of grains daily, which are to be cooked in the school.

Fortification in Integrated Child Development Services (ICDS)

Supplementary Nutrition (SN) has been provided to the ICDS Scheme for the two kind of beneficiaries, i.e., first Take-Home Ration (THR) for the pregnant women and lactating mothers, and second for children aged 6 months to 3 years. Supplementary Nutrition is served to the beneficiaries under the National Food Security Act, 2013, which provides food security to the people. ICDS follows different models in different states.

Fortification in the Public Distribution System

Public Distribution System (PDS) is one the most important mediums for government to maintain food security in India, which has been implemented by the Ministry of Consumer Affairs, Department of Food & Public Distribution.

The present PDS includes staples food like wheat, rice and sugar as well as kerosene. Depending on states/UTs, some of them also permit the sale of food items such as pulses, edible oils, iodized salt, spices, etc. through the PDS system.

The government of India has initiated programs for food security in order to improve the nutritional deficiencies level in India through the mandated government schemes, which are given below:

National Food Security Act

National Food Security Act is an important policy by the government to reduce hunger and improve food security scenario in India. It mandates to provide enough quantity of quality food at reasonable prices to vulnerable sections of society. It aims to cover around 75% rural population and 25% urban population. Registered households that are below poverty line will be entitled to 5 Kg of food grains per person at issued prices, which includes rice, wheat & coarse grains.

Under NFSA 2013, beneficiaries under the AAY or PHH (Priority Households /Non-AAY) get rice at INR 3 per kg, and wheat at INR 2 per kg, and the overall entitlement is 35 kg per month per family.

This Act is based on the population figures of Census, 2011. As of 2019, it has been implemented in all 36 States/UTs and covers around 813.5 million of the country's population.

Poshan Abhiyaan:

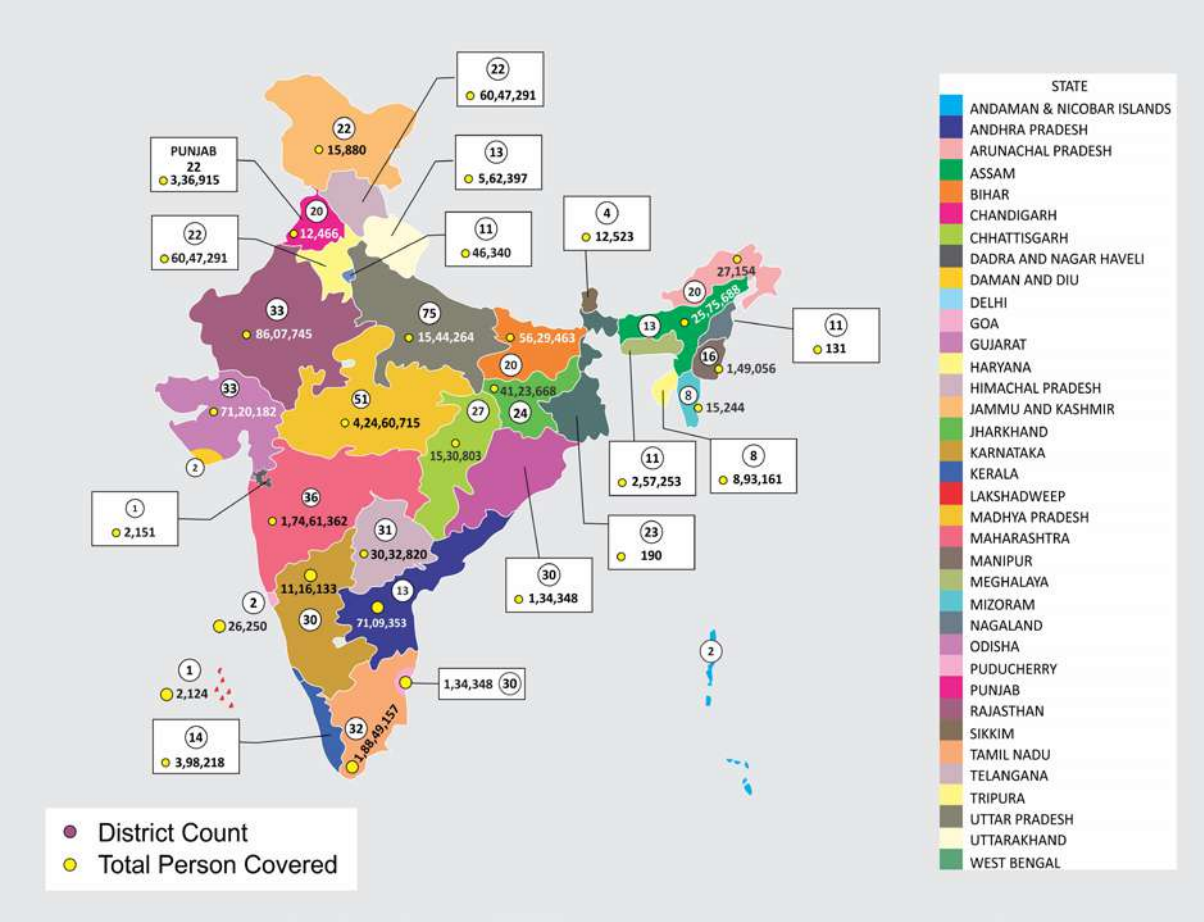
Poshan Abhiyaan is also known as National Nutrition Mission. It was inaugurated by Prime Minister Shri Narendra Modi on March 2018. It is a multi-ministerial convergence mission with the motive to make India malnutrition free by 2022.The objective of Poshan Abhiyaan is to decrease stunting in identified districts of India with the highest malnutrition prevalence by improving the Anganwadi Services and quality of Anganwadi Services delivery. Its vision is to ensure development and adequate nutrition for pregnant women, lactating mothers and children. The broad themes of Poshan Abhiyaan are designed to increase focus on Adolescent Education, Diet, Food Fortification & Micronutrients, Age of Marriage, Anemia, Antenatal Checkup, Breastfeeding, Diarrhoea, ECCE (Early Childhood Care and Education), Growth Monitoring, Hygiene, Water, Sanitation and Immunisation.

Ministries associated with the Poshan Abhiyaan are as under:

1. Ministry of Women & Child Development
2. Ministry of Health & Family Welfare
3. Ministry of Drinking Water & Sanitation
4. Ministry of Rural Development
5. Ministry of Housing & Urban Affairs
6. Ministry of Panchayati Raj
7. Ministry of Human Resource Development
8. Ministry of Information & Broadcasting
9. Ministry of Tribal Affairs
10. AYUSH (Ministry of Ayurvedic, Yoga and Naturopathy, Unani, Siddha and Homeopathy)
11. Ministry of Youth Affairs & Sports
12. Ministry of Defence
13. Ministry of Agriculture & Farmers Welfare
14. Food Safety and Standards Authority of India
15. Ministry of Minority Affairs

Ministry of Women and Child Development in India/ poshanabhiyaan.gov.in/

Picture 8: Coverage of the Poshan Abhiyaan



National Nutrition Strategy

The National Nutrition Strategy (NNS) has been published by NITI (The National Institution for Transforming India) Aayog in 2017 which is majorly focusing on drinking water & food, health services, sanitation and income in order to improve nutrition level in India. 'National Nutrition Strategy is linked with the Kuposhan Mukt Bharat, Swachh Bharat and Swasth Bharat schemes. The National Nutrition Strategy identified the basic nutrition intervention for the vulnerable groups which would be taken care under the program and include:

1. Infant and Young Child Care and Nutrition
2. Infant and Young Child Heath
3. Maternal Care, Nutrition and Health
4. Adolescent Care, Nutrition and Health
5. Addressing Micronutrient Deficiencies
6. Community Nutrition (Interventions Addressing the Community)

In order to create the awareness of the fortification in India government has initiated the marketing campaigns:

Picture 9: Government Initiated Marketing Campaign

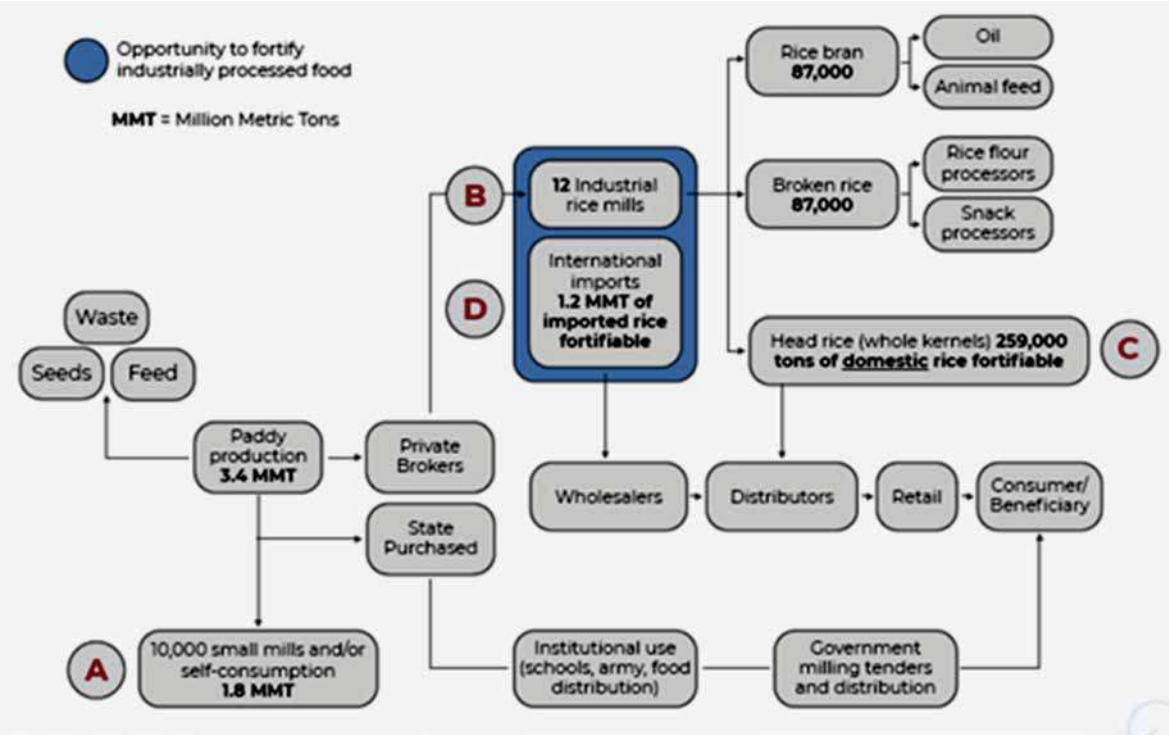
6. SUPPLY CHAIN & DISTRIBUTION

The supply chain of the fortified food focuses on identifying where, when, and how much food can be fortified. What ingredients must be added? Also, it focuses on how minerals and vitamins should be added.

The most important goals of supply chain analysis:

- To identify a centralized place because it is easier to fortify quantifiable food together instead of fortifying a small quantity.
- When fortification is done at a centralized place, the equipment required is also less.
- The supply chain is different depending on the type of food.
- First, food for fortification has to be collected from the farmers and small mills/private partners.
- After the paddy production, it's either sent to the private brokers/manufacturers or purchased by the state government.
- Then the food is sent for the fortification in the rice mills. For example, rice (It could be manufactured as rice bran or broken rice or whole rice). Whole rice is used for consumption.

Picture 10: Supply Chain of Fortified Food



7. COMPETITIVE ANALYSIS

Fortified products are available Pan India. Few brands are offering product throughout India and few brands are offering products in the regional market.

Picture 11: Fortified Product Companies Presence In India

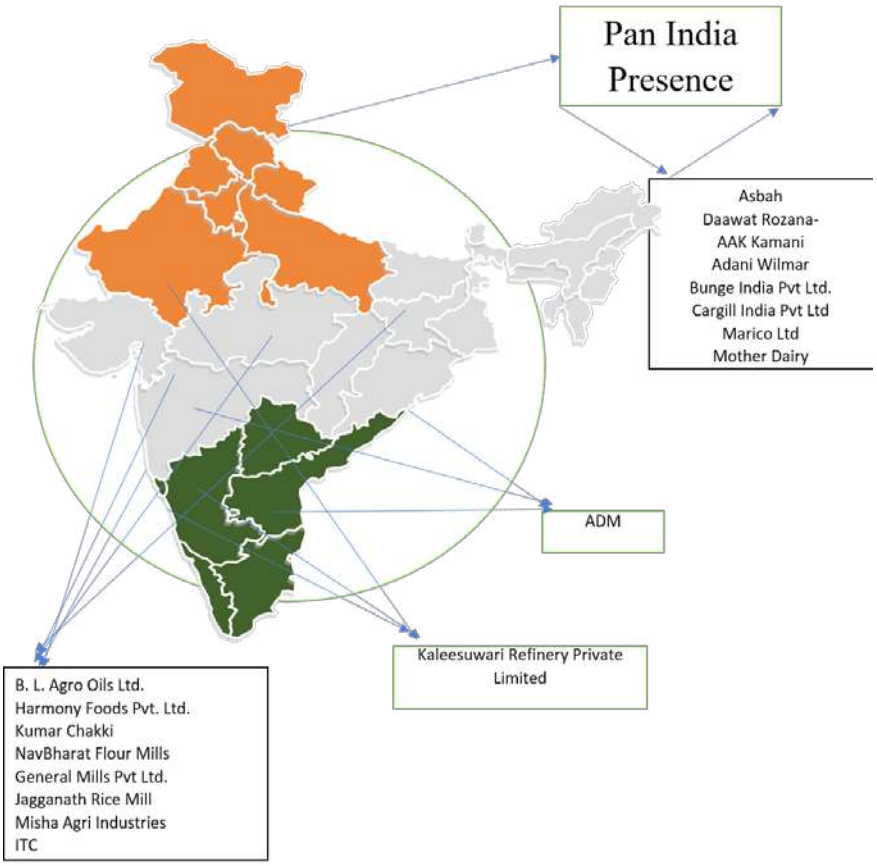


Table 17: Fortified Products Prices In India

Product	Quantity	Price
Daawat Rozana Gold Basmati Rice	1kg	99
Tata Salt	1kg	18
Patanjali Double Fortified Salt- Richness of Iron & Iodine	1kg	100
Fortune Sunlite Refined Sunflower Oil,	1L	119
Fortune Goldnut Refined Groundnut Oil	1L	149
Dhara Nourish Refined Sunflower Oil Pouch	1L	120
Dhara Groundnut Oil Pouch	1L	155
Aashirvaad Shudh Chakki Atta	5kg	193

8. CONTRIBUTORS & CHALLENGES

Contributors:

Initiatives for Boosting Fortification:

FSSAI is engaging with the rice industry to work on rice fortification. Companies like DCP India Pvt. Ltd and LT Foods Pvt. Ltd are already providing fortified rice in the open market. Other companies such as Adani Wilmer, Pattabi Agro, K.K.R group also plan to start fortification of rice in the open market. States like Karnataka and Odisha have already started fortification of rice in their MDM (Mid-Day Meal) programs. Government of India has already given approval to centrally sponsor pilot scheme for" Fortification of Rice in Public Distribution System and their Distribution".This Scheme has been approved for 3 years beginning 2019-20. The incremental cost @ 60 paise per kg is also reimbursed to the rice millers through States/UTs for the total volume of fortified rice produced through the mills. Non-profit organizations are also increasingly coming forward to support fortification initiatives.

Rising Awareness:

An increasing number of people are becoming more aware of fortified food and understand that a little price doesn't create much difference. Well-known brands such as Patanjali and General Mills have announced their support for fortification in India. The rural part of India is also showing momentum due to schemes implemented by the government. Availability of the fortified food across the departmental stores and kirana stores is also rising.

Revision of Government Standards:

FSSAI has laid the standards for fortification of salt with iron and iodine (150 micrograms at retail level) and enlisted two formulations - Ferrous Sulphate (FS) with stabilizer Sodium Hexametaphosphate (SHMP) to prevent reaction between iodine and iron; and Ferrous Fumarate encapsulated by soya stearin (EFF) to prevent interaction between iodine and iron. FSSAI constantly revises standards and conducts timely meetings related to large scale fortification. Ministry of Women and Child Development has mandated the use of DFS (Double Fortified Salt) under ICDS and MDM since 10th July 2017 and 2nd August 2017, respectively.

Challenges

Dominance of Unorganized Market:

Currently, the wheat flour market is mainly dominated by local players and small scale chakkis. Thus, it presents a challenge for the government to implement its fortification initiatives. Moreover, it is difficult for the government to conduct quality control measures to that level. There is a need to encourage makers to take fortification measures and help them in implementing the prescribed standards.

DFS Procurement:

DFS (Double Fortified Salt) production can be increased in order to reach most of the household over the next 3–5 years. In order to encourage adoption of DFS, awareness programs should be

conducted by central/state governments. DFS was introduced under SNP and directives were issued in 2011, but procurement of DFS has become a major challenge due to non-availability of the same in the open market.

Distribution and Supply Chain Strengthening:

Supply chain logistics infrastructure that facilitates supply of rice to the safety net programs in India, especially Targeted Public Distribution System (TPDS), needs to be strengthened through the state levels. As of now, central government is responsible for the procurement, allocation and transportation of food grains to their designated depots operated by the (FCI) Food Corporation of India. The operational responsibility of allocation of food grain, distribution, identification of the beneficiaries, issuance of the ration cards is under the state government/UTs.

8. WAY FORWARD AND RECOMMENDATIONS

- The government should intervene and set prices for fortified staples so that the companies are not able to sell fortified food at the higher price than those set by the government. It can be encouraged first at the miller level. Fortified rice must have low GST so that it would remain affordable for most of the population in the open market. There is a need to take care of the urban poor as people who are not connected with the PDS are unable to get adequate nutritional food. There is a specific need to identify the beneficiaries. People who are above the poverty line are getting ration cards in order to get the low-price ration, but people below the poverty line and most vulnerable groups aren't able to get their due on account of inadequate government infrastructure.

- The quality check should be done at the regular intervals at the Pubic Distribution System in order to ensure the best quality fortified food for the vulnerable groups. The industry is fragmented and thus it is not possible to make unbranded products ready for the fortification. The government must encourage the small-scale producers for fortification. It is recommended to make fortification mandatory for branded milk for at least 6 months. For now, unbranded milk can be exempted from the mandatory fortification. Fortified flour should also be made mandatory for at least 6 months. Also, GST should be removed in order to make fortified food available for the country's population falling below poverty line.

- In a recent report published by the UNICEF in 2019, malnutrition has caused 69% of deaths of children below the age of five in India. Though the National Nutrition Mission is playing an important role in improving nutrition scenario in India, there is still a need to take care of malnutrition in the country through fortification. In March 2018, Anaemia Mukt Bharat programme was by the government of India to fight anaemic prevalence across the country. Also, it has been recognized as one of the best programmes implemented by governments across the world to address malnutrition. The 6X6X6 strategy (six target beneficiary groups, six interventions and six institutional mechanisms) was also launched to fight anaemia in India. Urban India is moving into an unhealthy food snacking environment, which is influencing children's food choices and this is spreading to rural areas as well. Food consumption patterns in India reveal that child diets are largely starved of proteins and micronutrients and are hugely influenced by household food choices in India. However, there is a need to identify latest consumption food patterns across the country, and thereafter develop an effective strategy supported with adequate infrastructure and government machinery to make food fortification successful in India.

Sources and References

Department of Agriculture, Cooperation & Farmers Welfare Ministry of Agriculture & Farmers Welfare Government of India, Annual Report 2019
Global Hunger Index, India Rankings, 2019
Food and Agriculture Organization of the United Nations, Food Security and Nutrition in the World, 2019
Food Safety and Standards Authority of India, Food fortification in India Status and Road Ahead, 2018
World Bank, Future of food Shaping the Global Food System to Deliver Improved Nutrition and Health, 2016
Global Scenario on Fortification of Staple Foods and its Implication, Ministry of Women and Child Development, Government of India 2019
India - South Africa agri trade 2018-19, Production, Stocks, Trade and Availability of Edible Oils
World health Organization, Global database on the Implementation of Nutrition Action
Global Health Risks, World health Organization, 2004
Food Safety and Standards Authority of India, Journey of food fortification in India, Large Scale fortification India 2017
National Notional Monitoring Bureau, Technical Report no 27
Salt Department Government of India, Ministry of commerce and Industry, Department of Policy and Production, Annual Report 17- 18, Salt production and Statics
Food Safety and Standards Authority of India, Food Fortification Resource Centre, Fortified brands and Availability & Nutritional Requirements for the staples.
Global Fortification Data Exchange, Fortification data
National Diary Development Board, Milk production and per capita availability of milk in India
Amazon.in pricing analysis of the staple food in India
Food and Nutrition Security Analysis, India, 2019, WFP and Ministry of Statistics & Programme Implementation
The Mother and Child Health and Education Trust, Malnutrition overview
Nutrition International, International Development Research Centre
Index Mundi, Wheat Production and consumption in India 2011-2019
Index Mundi, Milled Rice Production in India 2011-2019
TechSci Research Analysis, Estimation of the functional food market in India & Globally
pulsusconference.com/ food science for functional food
Directorate of Vanaspati, Vegetable oil and Fats (DVVOF) and Department of Commerce, oil production in India
Ministry Of Health And Family Welfare (Food Safety And Standards Authority Of India) Regulations & Standards
Nutraceuticals, Functional Foods and Dietary Supplements in Health and Disease, functional food overview and functional food ingredients, Journal of Food and Drug Analysis, Vol. 20, Suppl. 1, 2012, Pages 226-230
Agriculture & Rural Development Department, World Bank, functional food overview
British Journal of Nutrition (2002), 88, Suppl. 2, S133–S138 DOI: 10.1079/BJN2002677q International Life Sciences Institute 2002
Functional Foods: Opportunities and Challenges for Developing Countries, Agriculture & Rural Development Department, World Bank
Ital. J. Food Sci., vol 28, 2016/ Functional Foods: Trends and Development Of The Global Market
Global health Alliance for Improved Nutrition, Food fortification as a complementary strategy for the elimination of micronutrient deficiencies: case studies of large-scale food fortification in two Indian States
Ministry of Consumer Affairs, Department of food & Public Distribution, NSSO data
Ministry of Women and Child Development in India/ poshanabhiyaan.gov.in/
Ministry of Health and Family Welfare, Government of India, National Nutrition Strategy

gain
Global Alliance for Improved Nutrition

The Global Alliance for Improved Nutrition (GAIN) is a Swiss-based foundation launched at the United Nations in 2002 to tackle the human suffering caused by malnutrition. Headquartered in Geneva, Switzerland, GAIN has offices in countries with high levels of malnutrition: Bangladesh, Ethiopia, India, Indonesia, Kenya, Mozambique, Nigeria, Pakistan, and Tanzania. To support work in those countries, we have representative offices in Denmark, the Netherlands, the United Kingdom, and the United States.

At GAIN, we believe that everyone in the world should have access to nutritious, safe, and affordable food. GAIN offers high quality know-how transforming food systems to improve the consumption of nutritious and safe food for all people, especially those most vulnerable to malnutrition.

We are unique because of our focus on food systems and diet quality, our alliance-based approach to working with governments, businesses & civil society, and our ability to engage critically and productively with the private sector. Our work to improve the consumption of safe and nutritious food is based on three strategic objectives:

- Increase consumer demand for safe and nutritious food
- Increase accessibility of safe and nutritious food

Strengthen the enabling environment for designing, implementing, and scaling up effective programs

ASSOCHAM
CELEBRATING 100 YEARS

THE KNOWLEDGE ARCHITECT OF CORPORATE INDIA

EVOLUTION OF VALUE CREATOR

ASSOCHAM initiated its endeavor of value creation for Indian industry in 1920. Having in its fold more than 400 Chambers and Trade Associations, and serving more than 4,50,000 members from all over India. It has witnessed upswings as well as upheavals of Indian Economy, and contributed significantly by playing a catalytic role in shaping up the Trade, Commerce and Industrial environment of the country.

Today, ASSOCHAM has emerged as the fountainhead of Knowledge for Indian industry, which is all set to redefine the dynamics of growth and development in the technology driven cyber age of 'Knowledge Based Economy'.

ASSOCHAM is seen as a forceful, proactive, forward looking institution equipping itself to meet the aspirations of corporate India in the new world of business. ASSOCHAM is working towards creating a conducive environment of India business to compete globally.

ASSOCHAM derives its strength from its Promoter Chambers and other Industry/ Regional Chambers/Associations spread all over the country.

VISION

Empower Indian enterprise by inculcating knowledge that will be the catalyst of growth in the barrier less technology driven global market and help them upscale, align and emerge as formidable player in respective business segments.

MISSION

As a representative organ of Corporate India, ASSOCHAM articulates the genuine, legitimate needs and interests of its members. Its mission is to impact the policy and legislative environment so as to foster balanced economic, industrial and social development. We believe education, IT, BT, Health, Corporate Social responsibility and environment to be the critical success factors.

MEMBERS – OUR STRENGTH

ASSOCHAM represents the interests of more than 4,50,000 direct and indirect members across the country. Through its heterogeneous membership, ASSOCHAM combines the entrepreneurial spirit and business acumen of owners with management skills and expertise of professionals to set itself apart as a Chamber with a difference.

Currently, ASSOCHAM has more than 100 National Councils covering the entire gamut of economic activities in India. It has been especially acknowledged as a significant voice

of Indian industry in the field of Corporate Social Responsibility, Environment & Safety, HR & Labour Affairs, Corporate Governance, Information Technology, Biotechnology, Telecom, Banking & Finance, Company Law, Corporate Finance, Economic and International Affairs, Mergers & Acquisitions, Tourism, Civil Aviation, Infrastructure, Energy & Power, Education, Legal Reforms, Real Estate and Rural Development, Competency Building & Skill Development to mention a few.

INSIGHT INTO 'NEW BUSINESS MODELS'

ASSOCHAM has been a significant contributory factor in the emergence of new-age Indian Corporates, characterized by a new mindset and global ambition for dominating the international business. The Chamber has addressed itself to the key areas like India as Investment Destination, Achieving International Competitiveness, Promoting International Trade, Corporate Strategies for Enhancing Stakeholders Value, Government Policies in sustaining India's Development, Infrastructure Development for enhancing India's Competitiveness, Building Indian MNCs, Role of Financial Sector the Catalyst for India's Transformation.

ASSOCHAM derives its strengths from the following Promoter Chambers: Bombay Chamber of Commerce & Industry, Mumbai; Cochin Chambers of Commerce & Industry, Cochin: Indian Merchant's Chamber, Mumbai; The Madras Chamber of Commerce and Industry, Chennai; PHD Chamber of Commerce and Industry, New Delhi.

Together, we can make a significant difference to the burden that our nation carries and bring in a bright, new tomorrow for our nation.

ASSOCHAM Contacts

assocham@nic.in

The Associated Chambers of Commerce and Industry of India (ASSOCHAM)
Corporate Office:
5, Sardar Patel Marg, Chanakyapuri, New Delhi - 110 021
Tel: 011 4655 0555 (Hunting Line) • Fax: 011 2301 7008, 2301 7009
Website: www.assocham.org

ASSOCHAM's REGIONAL & OVERSEAS OFFICES

ASSOCHAM CORPORATE OFFICE

5, Sardar Patel Marg, Chanakyapuri, New Delhi-110 021
Tel: 011-46550555 (Hunting Line) • Fax: 011-23017008, 23017009
Email: assocham@nic.in • Website: www.assocham.org

ASSOCHAM REGIONAL OFFICES

Ms. Uma Shashi Nair, Regional Director
#F1, First Floor, Richmond Plaza, No. 10 & 10/1,
Raja Ram Mohan Roy Road, Bangalore-560 025
Tel: 080-41132467/41131891/41134838; Mb: 9036333975
E-mail: umasnair@assocham.com

Mr. Vipul Gajingwar, Regional Head
608, 6th Floor, SAKAR III, Opposite Old High Court
Income Tax Cross Road, Ashram Road, Ahmedabad-380 014, Gujarat, India
Tel: 079-2754 1728-29/2754 1876; Mb : 9810825894
E-mail: Vipul.bg@assocham.com

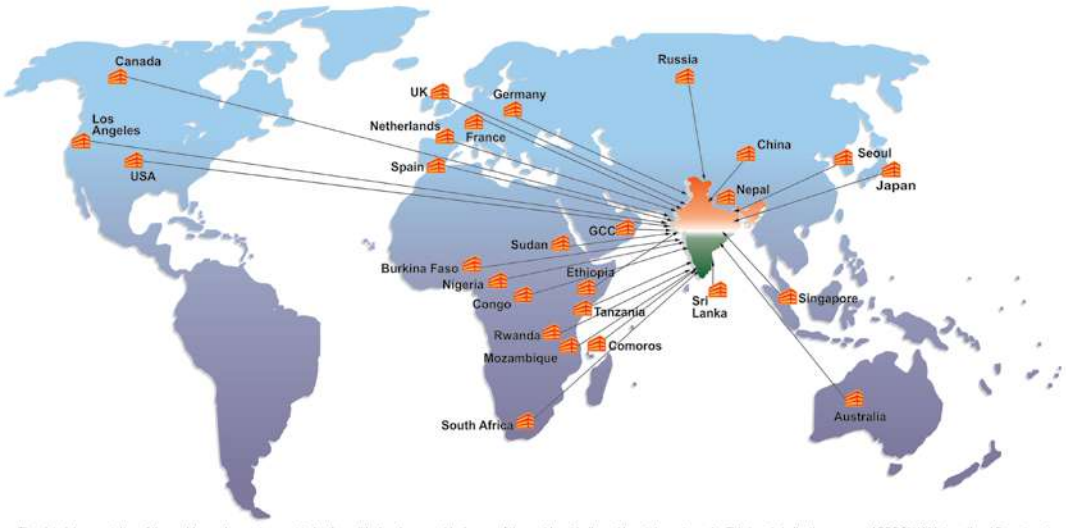
Mrs. Perminder Jeet Kaur, Regional Director
18, Ballygunge Circular Road, Kolkata-700 019
Tel: 91-33-4005 3845/41; Fax: 91-33-4000 1149; Mb: 9674312234
E-mail: Perminder.kaur@assocham.com

Mr. Bharat Jaiswal, Regional Director
503/D, Mandir Marg-C, Ashok Nagar, Ranchi-834 002
Tel: 0651-6555601 /65555801/ 2242443; Mb: 9971047550
E-mail: bharat.jaiswal@assocham.com

Mr. Gourav Mahajan, Regional Director
SCO: 55, 56, 57, II Floor
Sector- 8C, Madhya Marg, Chandigarh- 160008
Phone: 0172-4800855, 4800865, Mb : 9876438111
Email : gourav.mahajan@assocham.com

ASSOCHAM Jammu and Kashmir Chapter
SHREE TOYOTA, Batra Group Complex,
Milestone Zero, Narwal Bala,
Jammu - 180001, India.

ASSOCHAM OVERSEAS 28 OFFICES



The pictorial presentation of the world map does not purport to be the political and geographical maps of the world and India and is not drawn to scale. This is only indicative. *ASSOCHAM International Department*

FOLLOW US ON

WE ARE TECHSCI RESEARCH

TechSci Research is a research-based management consulting firm providing market research and advisory solutions to its customers worldwide, spanning a range of industries. TechSci Research's core values are value, integrity and insight. Led by a team of dynamic industry experts, TechSci Research provides its customers with high value market research and advisory services that helps them identify new market opportunities, growth engines and innovative ways to capture the market share. As a result, TechSci's client leads rather than follow market trends. Not bound by legacy, TechSci's cutting-edge research model leverages its decades of research knowledge and an increased use of technology as engines of innovation to deliver unique research value. Provided as an alternative to traditional market research, TechSci Research reports do not just deliver data and knowledge rather highlights the insights in a more usable and interactive format for its clients.

TechSci Research – North America
708 Third Avenue, Manhattan,
New York, United States
Email: sales@techsciresearch.com
Tel: +1- 646- 360- 1656

TechSci Research – Europe
54, Oldbrook, Bretton,
Peterborough, United Kingdom
Email: sales@techsciresearch.com

TechSci Research – Asia-Pacific
B– 44, Sector -57, Noida,
National Capital Region, U.P. - India
Tel: +91-120-4523900
Email: sales@techsciresearch.com

www.techsciresearch.com

ASSOCHAM Corporate Office
5, Sardar Patel Marg, Chanakyapuri, New Delhi - 110021
Mail : assocham@nic.in
Website : www.assocham.org
Tell : 011-46550555 (Hunting Line)
Fax : 011-23017008, 23017009

New Age TechSci Research Pvt. Ltd.
B – 44, Sector 57, Noida, National Capital Region, India – 201301
Mail : info@techsciresearch .com
Website : www.techsciresearch.com
Tell : +91 120 4523900