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FOOD FORTIFICATION: AN EFFECTIVE TOOL TO COMBAT HIDDEN HUNGER?

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ABSTRACT

Hidden hunger is one of the most profound socio-economic issues across the globe. It is the root cause of many diseases, lower immunity, irreversible abnormalities and lesser economic security. Food Fortification has been practised globally to mitigate hidden hunger. *It is a remarkable technological advancement with multiple benefits. In many countries viz. Canada, Switzerland and Nigeria fortification practices have improved the health and immunity of the target population. However, indiscriminate use of fortification may lead to degradation of public health.*

India has been practicing voluntary fortification of various food products since the 1950s. Fortified rice and wheat in various districts of Odisha and Bengal have significantly improved the health of women and children. Recently, the Food Safety and Standards Authority of India has proposed mandatory fortification of edible oil, milk and rice from 2024.

Health of the people is one of the most imperative aspects of public policy and fortification practices will yield results only if implemented in a systematic manner on the basis of comprehensive law or guidelines. This article makes an attempt to analyse the impact of mandatory fortification on the target population. Further, the article discusses the lacunae in the existing legal framework

regarding food fortification practices. Lastly, the article will conclude with plausible solutions which can be adopted in the best interest of all the stakeholders.

Introduction

“There are people in the world so hungry, that God cannot appear to them except in the form of bread.” – Mahatma Gandhi

Many countries across the globe provide food to the poor via various schemes and policies, however, it fails to meet the nutritional requirements of the people. According to World Health Organization (WHO) in the year 2020, around 1.9 billion adults and 149 million children under the age of 5 were affected by any one form of malnutrition viz. overweight, obesity, underweight, inadequate vitamins and minerals etc., leading to acute and chronic diseases and abnormalities.⁷⁹³ India has been ranked 101 out of 116 countries in the Global Hunger Index (GHI).⁷⁹⁴ The statistics portend an alarming state of nutritional deficiency in the future, whereby the authorities need to take immediate action to alleviate malnutrition in society.

Hidden hunger is defined as a nutrition deficiency that occurs when intake or absorption of micronutrients is low in order to sustain a healthy body and mind.⁷⁹⁵ Hidden hunger might be an invisible phenomenon but it has a deep-rooted impact on the population both locally and globally. It may result in irreversible abnormalities in the body, permanent brain damage, adults may have lower immunity and children remain underdeveloped. People fail to realize their intellectual and physical potential due to paucity of nutrients. Additionally, poor health leads to lesser economic security and results in

⁷⁹³ WORLD HEALTH ORGANIZATION <https://www.who.int/news-room/fact-sheets/detail/malnutrition> (last visited Jan. 21, 2022).

⁷⁹⁴ GLOBAL HUNGER INDEX, <https://www.globalhungerindex.org/india.html> (last visited Jan. 20, 2022).

⁷⁹⁵ GLOBAL HUNGER INDEX, https://www.ifpri.org/sites/default/files/ghi/2014/feature_1818.html (last visited Jan. 19, 2022).

devastating consequences like poverty and poor health.⁷⁹⁶

One of the most widely used tools to combat hidden hunger is the fortification of food. World Health Organization defines food fortification as “the practice of deliberately increasing the content of an essential micronutrient, i.e., vitamins and minerals (including trace elements) in a food, so as to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health.”⁷⁹⁷ It is widely used in Switzerland, Canada and United States of America to fulfill the nutritional needs of the population.

The right to food is recognized under Article 25 of the Universal Declaration of Human Rights, 1948.⁷⁹⁸ It states that “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food.”⁷⁹⁹ Similarly, Article 11 (1) of the International Covenant on Economic, Social and Cultural Rights recognizes the right of everyone to be free from hunger as a fundamental right of every human being.⁸⁰⁰

The Hon’ble Supreme Court in a catena of judgements has propounded that the Right to food has been considered to be an integral part of Article 21 of the Constitution of India.⁸⁰¹ In the landmark case of *People’s Union for Civil Liberties v. Union of India & Ors.* it was observed that “right to food comes under the ambit of right to life.” The court further stated that government should take proactive initiatives to ensure that adequate and nutritious food reaches those who are poor, vulnerable malnourished.⁸⁰² The Directive Principles of State

Policy also highlight the need for a state to formulate policies that provide adequate and nutritious food to all citizens. Wherefore, India should make concerted efforts to eliminate hidden hunger and ensure that right to food is enjoyed by all its citizens.

Lack of awareness, poverty, lack of access to government aid are the primary reasons for the increase in malnutrition in developing countries.⁸⁰³ Notably, the developed countries and the privileged section of the society are also exposed to the threat of micronutrient deficiency due to excess consumption of junk food, unhealthy lifestyle, sedentary work life etc. Malnutrition is a grave and pressing socio-economic issue, hence, United Nations has declared 2016-25 as a decade for action on nutrition to promote food security and a sustainable food system across all countries.

I. Need For A Comprehensive Legal Framework Vis A Vis Food Fortification

Law is recognized as a potent tool to improve the health of the population at the local and global levels. An exhaustive and robust legal framework acts as a bedrock for the effective implementation of healthcare policies. It provides a detailed account of responsibilities and functions of the government, the officials, coordination amongst various departments, collection and analysis of data for curating target-specific policies etc.⁸⁰⁴ Therefore, a well-defined legal framework will ensure the successful implementation of the fortification program in the country.⁸⁰⁵

⁷⁹⁶ WORLD HEALTH ORGANIZATION, <https://www.who.int/publications/i/item/9241594012> (last visited Jan. 15, 2022).

⁷⁹⁷ *Id.*

⁷⁹⁸ Universal Declaration of Human Rights, G.A. Res. 217 (III) A, U.N. Doc. A/RES/217(III) (Dec. 10, 1948).

⁷⁹⁹ *Id.*

⁸⁰⁰ International Covenant on Economic, Social and Cultural Rights, 1960, art. 11 (1).

⁸⁰¹ INDIA CONST. art. 21.

⁸⁰² *People’s Union for Civil Liberties v. Union of India & Ors.*, (2004) 12 SCC 108.

⁸⁰³ Rebecca Olson, Breda Gavin-Smith, Chiara Ferraboschi and Klaus Kraemer, *Food Fortification: The Advantages, Disadvantages and Lessons from Sight and Life Programs*, 13 NUTRIENTS 1118 (2021), <https://www.mdpi.com/2072-6643/13/4/1118>.

⁸⁰⁴ WORLD HEALTH ORGANIZATION, <https://apps.who.int/iris/handle/10665/252815> (last visited Jul. 6, 2022).

⁸⁰⁵ Marjoleine Amma Dijkhuizen, Frank Tammo Wieringa, Damayanti Soekarjo, Khan Tran Van, Arnaud Laillou, *Legal framework for food fortification: Examples from Vietnam and Indonesia*, 34 FOOD AND NUTRITION BULLETIN 2 (2013), <https://journals.sagepub.com/doi/pdf/10.1177/15648265130342S113>.

Primarily, the fortification legislation should set out a public health objective that it seeks to achieve.⁸⁰⁶ It should foster credibility by curating specific provisions with respect to maintaining quality, consumer safety, cost-effectiveness, labeling, suitable packaging, storage in a controlled environment, transportation in suitable conditions and promote sustainability of the fortified food products.⁸⁰⁷ In addition to the scientific aspect of the addition of minerals to enhance the nutritional content, the law must also take into consideration consumer awareness, streamlined monitoring and evaluation of the fortified products.

With the introduction of the *Food Safety and Standards (Fortification of Foods) Regulations, 2016*, which was later modified to *The Food Safety and Standards (Fortification of Foods) Regulations, 2018*,⁸⁰⁸ India aims to create a comprehensive legal framework to regulate food fortification in India. It aims to realize the objectives of Article 21 and Directive Principles of State Policy by ensuring that every individual consumes nutritious food. The important aspects of the regulation are analysed as under:

A. Public Health Objective and Quantity of

Fortificant: Regulation 3 defines the object of the fortification policies.⁸⁰⁹ It states that fortification is implemented to address the deficiency in order to meet the nutritional requirements and improve the health of an individual. Additionally, Regulation 4⁸¹⁰ and Regulation 3 provide that the micronutrients or fortifications shall be added as per the standard range provided under Schedule I. The schedule

is technical and descriptive in nature. By clearly demarcating the type and amount of fortificant to be added in various food drivers, the provision acts as a guiding light for the manufacturers.

B. Quality Assurance: Quality assurance and monitoring by the manufacturer is dealt under Regulation 5.⁸¹¹ It mandates the manufacturer to give an undertaking coupled with suitable evidences twice a year to the Food Authority or any other designated authority. A certificate needs to be submitted under the aegis of the food authority, indicating that the fortification is carried out as per the prescribed standard under the law. It also provides for monitoring during the manufacturing and packing process, random testing of products and regular audit of the technical equipment and compliance with the procedure. Regulation 5 address the safety of consumer to an extent however it has many loopholes which impinge the effectiveness of fortification practices.

The regulation lacks a well-oiled system of licensing or registration manufacturers and intermediaries. It also fails to provide a comprehensive monitoring and evaluation process. A three-tier monitoring system can be beneficial to ensure that the objectives of quality assurance and consumer safety are met.⁸¹² The first level of monitoring should be at the production site. The manufacturer should conduct rigorous internal monitoring throughout the manufacturing and packing stage.⁸¹³ At the second level, external monitoring should be conducted at the manufacturing site by the researchers

⁸⁰⁶ *Id.*

⁸⁰⁷ Rose Nathan, *Regulation of Fortified Foods to Address Micronutrient Malnutrition: Legislation, Regulations and Enforcement*, IODINE GLOBAL NETWORK (Jul. 2, 2022, 9:29 PM), <https://www.ign.org/regulations-of-fortified-foods-to-address-micronutrient-malnutrition-legislation-regulations-and-enforcement-2000.htm?from=0142002801>.

⁸⁰⁸ *Food Safety and Standards (Fortification of Foods) Regulations, 2018, Regulation 1*, Gazette of India, pt. III sec. 4 (Aug. 2, 2018).

⁸⁰⁹ *Food Safety and Standards (Fortification of Foods) Regulations, 2018, Regulation 3*, Gazette of India, pt. III sec. 4 (Aug. 2, 2018).

⁸¹⁰ *Food Safety and Standards (Fortification of Foods) Regulations, 2018, Regulation 4*, Gazette of India, pt. III sec. 4 (Aug. 2, 2018).

⁸¹¹ *Food Safety and Standards (Fortification of Foods) Regulations, 2018, Regulation 5*, Gazette of India, pt. III sec. 4 (Aug. 2, 2018).

⁸¹² Marjoleine Amma Dijkhuizen, Frank Tammo Wieringa, Damayanti Soekarjo, Khan Tran Van, Arnaud Laillou, *Legal framework for food fortification: Examples from Vietnam and Indonesia*, 34 FOOD AND NUTRITION BULLETIN 2 (2013), <https://journals.sagepub.com/doi/pdf/10.1177/15648265130342S113>.

⁸¹³ *Id.*

and officers authorized by the government. And at the third level, a detailed inspection should also be conducted at the market or retailer or even at the stage of the consumer. The law should be meticulously drafted by clear demarcation of the function and power of the monitoring or inspection authorities, timeline, schedule and criteria of inspection.

Notably, Regulation 7, provides that the packaging of the product should be in accordance with the nature of fortificant added and its stability to ensure longevity of shelf life.⁸¹⁴ It further states that Food Safety and Standards (Packaging and Labeling) Regulations, 2011 are applicable to all fortified food products.⁸¹⁵ Nevertheless, the regulations fail to take into account the stability of micronutrients which is dependent on light exposure, temperature, the chemical form of the food etc.⁸¹⁶ Therefore optimum level of packing is imperative to minimize the loss of micronutrients during storage and transportation of the food. For instance, oil fortified with Vitamin A is packed in plastic containers as it is cheap and accessible. On the contrary glass bottles will be suitable alternative as it is impermeable to oxygen which prevents the degradation of Vitamin A.⁸¹⁷

In a similar vein, the storage and transportation conditions are sine qua non for successful implementation of the fortification process. The product received by the consumer should be of the optimum quality.⁸¹⁸ The stability of

micronutrients is susceptible to temperature, light exposure, moisture, air etc. Wherefore, the regulations should provide a comprehensive set of guidelines to all the stakeholders with respect to the appropriate packaging, storage and transportation conditions specific to each food driver and fortificant.⁸¹⁹

C. Repercussions of Non-compliance

Consumer safety is cardinal to any legislation concerning the health of the population. Detailed and specific provisions for penalty should be provided in the law for any non-compliance with any fortification law or regulation. It will promote the quality assurance and safety of consumers. The law should provide for civil as well as criminal action against anyone who contravenes the law or regulations. The state or the consumer should be empowered to take civil and criminal action against the licensee, manufacturer, or person responsible for storage, transportation, packaging etc. for violation of any provision. The court should impose appropriate civil fine or compensation taking into account the magnitude and continuation of such violation.⁸²⁰

Additionally, a parallel remedy for criminal enforcement should also be provided in the law. Anyone who wilfully contravenes the regulations or provisions of the fortification laws should be punished with an appropriate fine or imprisonment or both as per the regulation.⁸²¹ The law should also provide for adequate defenses for licensee or

⁸¹⁴ Food Safety and Standards (Fortification of Foods) Regulations, 2018, Regulation 7, Gazette of India, pt. III sec. 4 (Aug. 2, 2018).

⁸¹⁵ Food Safety and Standards (Packaging and Labelling) Regulations, 2011, Regulation 1, Gazette of India, pt. III sec. 4 (Aug. 1, 2011).

⁸¹⁶ INTERNATIONAL FINANCE CORPORATION, [https://www.ifc.org/wps/wcm/connect/97e60679-e1ff-4995-931c-b84816d561f5/Food+Fortification+leaflets+combined.pdf?MOD=AJPERES&CVID=nKy9i2k#:~:text=Food%20fortification%20refers%20to%20the,from%20the%20population's%20food%20base.\(last%20visited%20Jul.%202,%202022\).](https://www.ifc.org/wps/wcm/connect/97e60679-e1ff-4995-931c-b84816d561f5/Food+Fortification+leaflets+combined.pdf?MOD=AJPERES&CVID=nKy9i2k#:~:text=Food%20fortification%20refers%20to%20the,from%20the%20population's%20food%20base.(last%20visited%20Jul.%202,%202022).)

⁸¹⁷ *Id.*

⁸¹⁸ WORLD HEALTH ORGANIZATION, <https://www.who.int/publications/i/item/9241594012> (last visited Jan. 15, 2022).

⁸¹⁹ Rose Nathan, *Regulation of Fortified Foods to Address Micronutrient Malnutrition: Legislation, Regulations and Enforcement*, IODINE GLOBAL NETWORK (Jul. 2, 2022, 9:29 PM), <https://www.ign.org/regulations-of-fortified-foods-to-address-micronutrient-malnutrition-legislation-regulations-and-enforcement-2000.htm?from=0142002801>.

⁸²⁰ *Id.*

⁸²¹ Rose Nathan, *Regulation of Fortified Foods to Address Micronutrient Malnutrition: Legislation, Regulations and Enforcement*, IODINE GLOBAL NETWORK (Jul. 2, 2022, 9:29 PM), <https://www.ign.org/regulations-of-fortified-foods-to-address-micronutrient-malnutrition-legislation-regulations-and-enforcement-2000.htm?from=0142002801>.

food seller viz. exercise of due diligence, handling the food product as per the mandate etc. and the burden of proof should be with the person charged with non-compliance. The legislature needs to strengthen the fortification laws by clearly providing for appropriate defenses and penalties or punishment for non-compliance.

Both mandatory and voluntary fortification are practiced in Vietnam on a large scale. The success of fortification in Vietnam is attributed to well-defined fortification procedures, roles and responsibilities of stakeholders and the time frame for the process. However, it lacks a robust system of monitoring, inspection and evaluation.⁸²² This leads to failure of fortification initiatives whereby a huge loss of money, technology and manpower is experienced. On the contrary, Indonesia has curated a holistic legal framework with provisions pertaining to quality assurance, monitoring, evaluation etc. but the lack of enforcement is the Achilles heel in its fortification laws.⁸²³ India should learn from the mistakes of other countries which led to the failure of fortification practices. Moreover, India should adopt innovative methods from other jurisdictions and modify them as per the needs of the Indian conditions in order to optimize the benefits of fortification and improve public health.

The fortification of food is a multi-sectoral process that encapsulates the essence of various important aspects like health, agriculture, science and technology, industry and law. Wherefore, a concerted and collaborative effort of various ministries viz. Ministry of health, Consumer Affairs, Food and Public Distribution, Electronics and Information Technology, Health and Family Welfare, Science and Technology and Food Processing Industries

is the need of the hour. It is necessary that their roles, responsibilities and powers are clearly defined in law.

The Food Safety and Standards (Fortification of Foods) Regulations, 2018 is a significant step towards a uniform fortification framework to be applicable in India but it fails to incorporate many aspects of international guidelines formulated by the WHO and Food and Agricultural Organization (FAO). Adherence to the international guidelines along with an effective monitoring mechanism is imperative for the best interest of the target population.

II. Can Mandatory Fortification Alleviate Hidden Hunger?

Voluntary fortification occurs when the manufacturer chooses to fortify a specific food product with a fortificant under any food law or guidelines by the government or after obtaining permission from the requisite authorities. Thus, the manufacturer exercises his free will to fortify the food products. While fortification is known as mandatory when a legal obligation is imposed on the manufacturers by application of law to fortify certain food products with specified nutrients.

Recently, the Food Safety and Standards Authority of India has proposed mandatory fortification of edible oil, milk (with vitamin A and vitamin D as fortificants) and rice (with vitamin B12, iron, and folic acid as fortificants).⁸²⁴ The objective of the law is the betterment of public health by ensuring that the requisite nutritional requirements of the population is fulfilled. This will result in the realization of the directions of the Supreme Court in landmark case **People's Union for Civil Liberties v. Union of India & Ors.**, wherein it was observed that the right to food is a subset of the right to life under article 21 of the constitution of India.

⁸²² Marjoleine Amma Dijkhuizen, Frank Tammo Wieringa, Damayanti Soekarjo, Khan Tran Van, Arnaud Laillou, *Legal framework for food fortification: Examples from Vietnam and Indonesia*, 34 FOOD AND NUTRITION BULLETIN 2 (2013), <https://journals.sagepub.com/doi/pdf/10.1177/15648265130342S113>.

⁸²³ *Id.*

⁸²⁴ THE HINDU, <https://www.thehindu.com/news/national/kerala/fssai-urged-to-drop-move-to-make-food-fortification-mandatory/article35689829.ece> (last visited Jul. 2, 2022).

However, fortification alone will not be sufficient to fulfill the nutritional requirements of the people in the long run. The World Health Organization in its guidelines on fortification of food raised grave concerns over the indiscriminate use of fortification.⁸²⁵ The limitations of mandatory fortification are enumerated as under:

- A. **Right to Choose:** The guidelines state that a person who has not consented to intake of fortified food cannot be compelled to eat it by way of legislation mandating fortification. Further, the right to choose comes within the ambit of the right to life and personal liberty under Article 21 of the Constitution of India.⁸²⁶ Thus, fortification should not be forced as every person has a right to exercise his or her volition with respect to the consumption of fortified food.
- B. **Excess Levels of Micronutrients:** Due to indiscriminate use, there is a high possibility of excess consumption of the nutrients than the prescribed quantity. It may result in permanent physiological and psychological disorders. In a few regions of the USA, many people were diagnosed with hypervitaminosis due to excessive fortification.⁸²⁷ Similarly, an increase in pathogenic microbes was observed due to excess iron fortification which caused abdominal inflammation amongst African children.⁸²⁸ Such depreciation of public health due to excess fortification is against the spirit of the statute.
- C. **Unfulfilled Level of Nutrition:** The nutrient requirement depends on the consumption of the fortified food in a considerable

amount. Thus, children and infants may not be benefitted as their intake is less in comparison to adults. Further, fortification of one of the micronutrients does not guarantee a healthy life. It is a balanced combination of all the nutrients which will make the population healthy. Thus, fortification of one of the nutrients is ineffective to counter multiple micronutrient deficiencies in the population.

- D. **Uncertainty Regarding Addition of Multiple Fortificants in a Single Food Driver:** There is a possibility of fortifying multiple micronutrients like iron, vitamins, minerals etc. in a single food driver but it may result in varying degrees of absorption of those micronutrients. For instance, few food items undergo a change in colour or taste on the addition of iron fortificant. Further, it has been observed that on addition of iron, iodine and vitamin fortificant to a single food driver, the effect of iodine and vitamin fortificants decreases.⁸²⁹ This results in excess expenditure of chemicals and technology without giving the desired outcome.
- E. **Failure to Reach the Most Vulnerable Section of the Society:** The poor and indigent are most likely to have nutritional deficiencies. Lack of awareness and access to the various government policies are the primary reasons for hidden hunger. Optimum health of the target population will not be achieved even after mandatory fortification if there is a lack of access to the vulnerable section of society. Thus, it is imperative that the authorities ensure adequate supply of fortified food to them.
- F. **Fortification is Not a Panacea:** The guidelines explicitly state that food fortification is not an alternative to a balanced healthy diet. It is merely a tool to combat excess nutritional deficiency. Thus, it can never be a long-term solution for malnutrition. Adequate policies of food

⁸²⁵ WORLD HEALTH ORGANIZATION, <https://www.who.int/publications/i/item/9241594012> (last visited Jan. 15, 2022).

⁸²⁶ INDIA CONST. art. 21.

⁸²⁷ Sherry A Tanumihardjo, Chisela Kaliwile, Erick Boy, Muhammad A Dhansay and Martha E van Stuijvenber, Overlapping vitamin A interventions in the United States, Guatemala, Zambia, and South Africa: case studies, 1446 ANN. N. Y. ACAD. SCI. 102, 110 (2019), <https://nyaspubs.onlinelibrary.wiley.com/doi/10.1111/nyas.13965>.

⁸²⁸ Michael B Zimmermann, Christophe Chassard, Fabian Rohner, Eliézer K N'Goran, Charlemagne Nindjin, Alexandra Dostal, Jürg Utzinger, Hala Ghattas, Christophe Lacroix, Richard F Hurrell, *The effects of iron fortification on the gut microbiota in African children: a randomized controlled trial in Côte d'Ivoire*, 92 AM. J. CLIN. NUTR. 1406, 1410 (2010), <https://academic.oup.com/ajcn/article/92/6/1406/4597520>.

⁸²⁹ WORLD HEALTH ORGANIZATION, <https://www.who.int/publications/i/item/9241594012> (last visited Jan. 15, 2022).

security, alleviation of poverty, awareness, education, better healthcare infrastructure, hygiene and sanitation are other important considerations that are imperative for achieving the optimum level of health.

Mandatory fortification has reaped successful results in Vietnam, Canada and few regions of the United States of America. However, the aforementioned concerns indicate that mandatory fortification is not the ultimate cure for malnutrition. According to the guidelines of WHO and FAO, mandatory fortification shall be introduced only when there is scientific data that reflects a significant risk to public health or that the targeted population is in need of the nutrients and that such needs can be fulfilled and risks can be reduced if the population consumes fortified food. This implies that mandatory fortification shall be applied only in case of exigency with appropriate precautionary safeguards.

Moreover, there needs to be a comprehensive legal framework in accordance with the international guidelines to achieve the right to food for all and for successful implementation of fortification. Fortification of food is a dynamic process.⁸³⁰ Therefore, after the introduction of laws, regular monitoring and evaluation of the impact of fortification practices will be helpful in designing a policy suitable for the target population.

III. Recommendations And Conclusion

Malnutrition or hidden hunger has a devastating impact on the physical and mental health of an individual. It leads to poverty and poor quality of life in the long run. Food fortification has been prevalent in various countries for many decades and has yielded fruitful results. MS Swaminathan Report also recommended food integration and fortification to eradicate nutritional deficiency amongst the

⁸³⁰ Rebecca Olson, Breda Gavin-Smith, Chiara Ferraboschi and Klaus Kraemer, *Food Fortification: The Advantages, Disadvantages and Lessons from Sight and Life Programs*, 13 NUTRIENTS 1118 (2021), <https://www.mdpi.com/2072-6643/13/4/1118>.

masses.⁸³¹ Therefore, in order to realize the Sustainable Development Goal 2 i.e., to achieve Zero Hunger by 2030 and eliminate all forms of malnutrition, there needs to be effective policies and practices to address the issue of hidden hunger.⁸³²

Albeit the *Food Safety and Standards (Fortification of Foods) Regulations, 2018* provides a detailed legal framework, there are a few limitations in the legislation which need to be addressed by the Government. Therefore, the following amendments can be made to make the future legislation more effective:

A. Comprehensive Legal Framework: The fortification regulations are a laudable initiative by the government to eradicate and eliminate pervasive hidden hunger in the country. It provides for self-monitoring, packaging and labelling instructions promoting quality assurance and consumer safety. Nevertheless, there are glaring voids that stymie the credibility and effectiveness of fortification.

1. **Mandatory licensing or certification:**

Many jurisdictions have mandated a license or registration for all manufacturers, sellers, exporters or importers.⁸³³ Such license or certification should be subject to renewal every year to ensure that they abide by the provisions of quality assurance. Moreover, repeated and wilful non-compliance should be considered as sufficient ground to revoke or suspend the license of the manufacturer or seller. This requirement should be incorporated in *Food Safety and Standards (Fortification of Foods) Regulations, 2018* to make the fortification process more transparent, accountable and safe for the consumers.

⁸³¹ PRS LEGISLATIVE RESEARCH, https://prsindia.org/files/policy/policy_committee_reports/1242360972--final%20summary_pdf_0.pdf (last visited Jan. 12, 2022).

⁸³² UNITED NATIONS, <https://www.un.org/sustainabledevelopment/hunger/> (last visited Jul. 2, 2022).

⁸³³ *Id.*

2. **Monitoring and investigation:** The regulation provides for undertaking to be submitted along with evidence to show that the manufacturer is abiding by the quality standards as per the law. However, this may result in a lack of compliance and the manufacturer may use dupable methods and continue to sell low-quality products to the consumer. It can be detrimental to the health of the consumer. Wherefore three-tier monitoring is required. The first level is self-monitoring by the manufacturer, the second and third level is by the state-authorized officers and researchers at the production site and retail shop respectively.⁸³⁴

3. **Packaging, storage and transportation:** The stability of the fortificant and the food driver depends on various external factors like temperature, moisture etc. Accordingly, the regulation should provide appropriate material for packaging each fortified product. Similarly, suitable conditions for storage and transportation should also be described to maintain the quality and stability of the fortified food product.

B. Acknowledging the Dynamic Nature of Fortification Laws: The legislation fails to provide for monitoring, data collection and evaluation of fortification policy on the target population after the food is consumed by them for a reasonable amount of time. Monitoring the impact of policy on regular and review of data collected after the implementation of policy gives valuable insights about the lacunae in the implementation process, impediments in the application of the law. Notably, evaluation of the policy at regular intervals determines the positive and negative impact of the policy on the population.

⁸³⁴ Marjoleine Amma Dijkhuizen, Frank Tammo Wieringa, Damayanti Soekarjo, Khan Tran Van, Arnaud Laillou, *Legal framework for food fortification: Examples from Vietnam and Indonesia*, 34 FOOD AND NUTRITION BULLETIN 2 (2013), <https://journals.sagepub.com/doi/pdf/10.1177/15648265130342S113>.

This helps the policymakers to make an informed and calculated decision regarding amendments that can be introduced to make the policy more effective for the stakeholders. Whereby instances of hypervitaminosis and toxicity due to excess consumption of micronutrients can be avoided.

Recently, Switzerland has revised its fortification standards to prevent overdose of nutrients.⁸³⁵ A similar approach was adopted by Vietnam where fortification was changed from mandatory to voluntary after the reduction of iodine deficiency. However, after a few years it was continued again owing to data that indicated dearth of iodine in the population.⁸³⁶

Wherefore, the *Food Safety and Standards (Fortification of Foods) Regulations, 2018* should incorporate a specific regulation to conduct regular monitoring and evaluation of fortification practices in India to avoid an overdose of micronutrients. The data collected should be stored in a digital database to analyse the effectiveness of policy and subsequently design policies as per the nutritional need of the population.

C. Civil and Criminal Enforcement: The law should empower the state and the consumer to take criminal and civil action against the manufacturer or seller who fails to comply with the fortification standards laid down in the regulation or legislation.⁸³⁷ This is an important safeguard to ensure the safety of consumers. Under the civil action, the court should be authorized to revoke or suspend the license for noncompliance with the regulations and to

⁸³⁵ Dr. Frank Mörsberger, *Comprehensive Revision of Swiss Food Law*, AGROLAB (Jan. 17, 2022, 9:03 PM), <https://www.agrolab.com/en/news/food-news/2737-swiss-food-law.html>.

⁸³⁶ Marjoleine Amma Dijkhuizen, Frank Tammo Wieringa, Damayanti Soekarjo, Khan Tran Van, Arnaud Laillou, *Legal framework for food fortification: Examples from Vietnam and Indonesia*, 34 FOOD AND NUTRITION BULLETIN 2 (2013), <https://journals.sagepub.com/doi/pdf/10.1177/15648265130342S113>.

⁸³⁷ Rose Nathan, *Regulation of Fortified Foods to Address Micronutrient Malnutrition: Legislation, Regulations and Enforcement*, IODINE GLOBAL NETWORK (Jul. 2, 2022, 9:29 PM), <https://www.ign.org/regulations-of-fortified-foods-to-address-micronutrient-malnutrition-legislation-regulations-and-enforcement-2000.htm?from=0142002801>.

impose appropriate compensation in consonance with the gravity of the circumstances. While in a criminal action the non-compliance should be punished with fine or imprisonment or both as per defined in the law. Moreover, if as a result of violation of any regulation the quality of the food is compromised leading to death or illness of any individual the punishment shall be increased in accordance with the law.

D. Mass Sensitization and Consumer

Demand: Regulation 8 (2) promotes the use of fortified food in the public distribution system and highlights the importance of awareness campaigns and technological assistance for the successful implementation of fortification policies.⁸³⁸

However, even after the existence of fortification of salt and vegetable oil since 1950 less than a minuscule population is aware of the fortification process. Audio-visual media is the quickest and most accessible medium to educate people about multiple social issues. Various short movies, advertisements and short videos should be created to spread information about fortification on different platforms viz. television, radio, various social media platforms. The process and its benefits should be told to the masses to create consumer demand in the market. The citizens should be made aware about the fortification logo [F+], amount of consumption, method of storage and cooking in order to optimize the benefits of fortified food.

Additionally, reduction of tax on fortified food, additional tax on non-fortified food coupled with license or certification mechanism can be another way to enhance consumer demand.

For any legislation to be effective, there should be a rigorous enforcement mechanism in force

especially when the subject matter is the health of the population. Comprehensive legislation and an effective implementation strategy are the key ingredients for the successful application of any law. Covid 19 pandemic has highlighted the importance of a balanced diet, strong immunity and hygiene for a healthy life. A population with micronutrient deficiency has lesser immunity which makes it more vulnerable to many diseases. Mandatory, food fortification can be an instrumental method to alleviate hidden hunger, however, its efficacy depends on efficient implementation. It has been observed that fortification has its own limitations, wherefore it cannot be a panacea for combatting malnutrition or hidden hunger. Primarily, the legal framework needs to be revamped to address the loopholes in the current fortification regime. Moreover, a holistic approach targeting alleviation of poverty, mass sensitization, education, better healthcare facilities, hygiene and sanitation, employment opportunities, agricultural practices coupled with food fortification can be effective to mitigate malnutrition.

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