

# ADDING DIVERSITY TO PLATE

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## **Executive Summary**

India has a dual responsibility to tackle the chronic crisis of malnutrition and anemia and building climate resilience for its food and agriculture sector. The recently announced programme on mandatory fortification of rice fails to address both the challenges. The government of India recently announced a policy for combating nutritional deficiency: mandatory fortification of Rice, to enhance micronutrients in the grain.

This announcement, as per the studies available in the public and the RTI responses from different government agencies, reveal that the government does not have enough research-based scientific evidence to substantiate that this move can really help in overcoming the widespread malnutrition and anemia among women and children. Contrarily, there are umpteen number of researches and studies which proposes dietary diversity as the sustainable, holistic and comprehensive solution for undernutrition. Similarly, there are scores of studies which suggest that enhanced agrobiodiversity significantly increases climate resilience and strengthens the livelihood security of farmers.

Greenpeace India, through this report re-emphasizes the importance of dietary diversity and creation of decentralised and community owned food systems which not only build food and nutritional sovereignty of the community but leads to a safe, sustainable and resilient food future for all.

Adding diversity to the food plate could be a sustainable response in tackling malnutrition and climate change.

Greenpeace India asks for a holistic strategy to address the issue of undernutrition and food insecurity through an effective implementation of natural and organic farming practices. These practices reduce the input costs for farmers while significantly increasing the prices of their products. This report also highlights the importance of public investment in promoting indigenous rice varieties which are high on nutraceutical values and are rich in micronutrients including iron, vitamins, zinc etc. instead of forcing women and children to consume chemically fortified pellets, injected with micronutrients.

Indigenous rice varieties suitable to the climatic conditions need to pose against false solutions such as fortification. Decentralized Nutritional Kitchen Gardens and community food parks can also be a possible way out.



## **Introduction**

lauded as a historic move to tackle the problem of nutritional deficiency in India, the Government of India announced to implement fortification of rice in the country(1). In his address to the nation, the Prime Minister mentioned that the lack of essential nutrients to women and children remain a major obstacle in development. Hence, to combat nutritional deficiency fortified rice would be channelised through public distribution systems from Integrated Child Development Schemes (ICDS) to Mid-Day Meals (MDMs). The nationwide policy on fortification is expected to be implemented by 2024(2).

As per NITI Aayog, the policy of Rice fortification is endorsed as an ambitious project which can provide a scientific, sustainable as well as cost effective method in reaching to the mass population with nutritional food. This, as said, could be a helpful scheme in reducing stunting, anaemia and other chronic morbidity in India. The fortification of rice is part of various other projects that the government has brought in to ensure nutritional security in the country(3).

The government of India has already started a Rs. 174.64 cr Centrally Sponsored Pilot Scheme on Fortification of Rice & its distribution under Public Distribution System for a period of three years in 2019-20. It has been started in 15 states of India covering one district each for the initial phase of implementation(4).

At a time when India needs to lead the global fight against climate change and hunger through it's science based diverse, comprehensive and indogeneous knowledge, policy

makers going for simplistic, linear, shortcut and false solutions, might be an attempt to derail the Indian advances towards tackling climate change and ensuring well being of people.

### **Climate Change impacting Food:**

It is now a well established fact that climate induced extreme weather events are adversely impacting agriculture in India. It is having a cascading effect on the purchasing capacity of farmers, food availability and rising food prices, and ultimately resulting in a bigger food and nutritional crisis.

Inter Parliamentary Panel on Climate Change (IPCC) in its special Report on Climate Change and Land(5), listed the ways in which climate change may impact food security and human health. The first could be affecting the amount of food, both from direct impacts on yields and indirect effects through climate change's impacts on water availability and quality, pests and diseases, and pollination services. Another can be through changing CO<sub>2</sub> in the atmosphere, affecting biomass and nutritional quality. Food safety risks during transport and storage can also be exacerbated by changing climate.

Indian government's own Ministry of Earth Sciences (MoES), in its first ever report on the state of climate crisis, Assessment Of Climate Change Over The Indian Region, categorically mentioned: India has witnessed a rise in average temperature, a decrease in monsoon precipitation; a rise in extreme temperature and rainfall events, droughts, and sea levels; and an increase in the intensity of severe cyclones, alongside other changes in the monsoon system. There is compelling scientific evidence that human activities

have influenced these changes in regional climate.

According to recent research by international scientists published by Nature Geoscience, **Homogenization of the terrestrial water cycle**(6), vast monocultures with identical plants lack varied leaves, barks and roots, resulting in “a more vulnerable soil-vegetation-atmosphere system that is less able to withstand fires, pests, and extreme weather events.”

Another study by Council on Energy, Environment and Water (CEEW) indicates that three out of four districts in India are extreme event hotspots, with 40 per cent of the districts exhibiting a swapping trend, that is – traditionally flood-prone areas are witnessing more frequent and intense droughts and vice-versa(7).

Several other studies and scientists suggest that monoculture-based industrial agricultural practices are highly vulnerable to climate change and extreme weather.

### **The Curious case of Fortification:**

#### **What is Fortification?**

Fortification, in simple terms, is a process of adding one or more vital nutrients in commonly consumed food like salt, oil, sugar, rice, milk etc. Fortification is done with an aim of increasing the nutritional value of a particular food which is consumed by the majority population. Since, Rice is assumed to be consumed by the majority of Indians, (which is a contesting assumption), the government plans to start with fortifying rice.

#### **Assumptions behind Fortification?**

Rice fortification is an ambitious project of the government of India in combating anemia and malnutrition in India.

The assumption behind its implementation is that the fortification process remains a proven, safe and cost-effective technique from improving the nutritional value of diets. The underlying assumption is that it helps in prevention of micronutrient deficiency in food which leads to various health related issues and chronic diseases. While fortification may be voluntary as well as mandatory, India has opted for mandatory Large Scale Food Fortification (LSFF).

### **Why Rice Fortification?**

As per the operational guideline provided by the Department of Food and Public Distribution, Rice has the highest potential among staple food fortification programs. It is a staple food of around 65 percent of the population and reaches the most vulnerable sections. Through the government safety net programs such as ICDS, Public Distribution System (PDS), and MDM program, rice remains the most distributed staple food. It has the potential reach of 800 million vulnerable people in India, especially women and children.

Hence, India has included staple food fortification (including rice fortification) under the National Nutrition Mission (Poshan Abhiyan) as a complementary intervention to reduce prevalence of anaemia and under-nutrition in India.

### **Where are the red flags?**

Experts point to several structural and scientific loopholes in the fortification process:

a.) Rice, despite being a staple of largest outreach, is still not able to reach 35% of the population.



b.) The fortification process nowhere mentions how the nutritional enrichment of the rest of the population could be done.

c.) The staple food fortification (including rice fortification) has been brought under the National Nutrition Mission as a complementary intervention to reduce prevalence of anaemia and under-nutrition in India. But reports already suggest severe lack of monitoring as well as accountability of the National Nutrition Mission of the government. There's no clarity on the assessment and impact of the project as of now(8).

d.) Another problem with the proposed mandatory rice fortification is that the major target of the project remains combating anemia amongst the population for which iron will be mixed. It will help in reducing the iron deficiency. There remains an ambiguity of positive outcome through this as the Comprehensive National Nutritional Survey 2016-18 has shown that Iron was responsible for less than half of the anemia cases. Other factors like protein, vitamins and a diverse diet are the solution to the prevalence of anemia(9).

e.) RTIs filed by Greenpeace India revealed a lack of science based evidence and data to back a scheme like fortification.

### **RTI responses from the Government agencies:**

Greenpeace India struggled to find any relevant data available in the public domain that could validate the need of such a gigantus policy, hence, we filed multiple RTIs with different government agencies.

On asking the basis on which the pilot project of rice fortification is approved, the Ministry of Consumer Affairs, Food and Public Distribution could not provide any specific survey or data.

The Ministry mentioned that the National Family Health Survey-4 (NFHS-4)(10) survey was taken into consideration for approving the Centrally Sponsored Pilot Scheme on 'Fortification of Rice and its Distribution under Public Distribution System' for a period of 3 years beginning in 2019-20. While the Ministry said that, "Third-party evaluation of the ongoing pilot scheme is due in the third year i.e. in 2021-2022." It also stated that states which are implementing the rice fortification pilot project have been asked to undertake the baseline/endline studies in coordination with their respective Health Departments etc.

Another RTI response from **Indian Council of Medical Research, National Institute of Nutrition (ICMR-NIN)** if they had conducted any study to estimate the wholesome impact of the chemically fortified food on the health of people with special focus to pregnant mother, feeding mothers, under five year children, undernourished and malnourished children. ICMR, in the response mentioned that they've NOT conducted any study to ascertain the impact of chemically fortified food.

Interestingly ICMR said that it did conduct a double blind randomized controlled study in government primary school children (5-11 year age group) on chemically fortified rice served as part of their mid day meal. But their findings showed, "iron fortified rice has a similar effect as mid day meal on improvement in anemia," which clearly raises doubts on the government's assumptions that fortified rice could be helpful in eradicating anaemia, that also means if mid day meal schemes are improvised, added with diversity and effectively implemented can itself be a boost in fight against malnutrition and anemia. Food Safety and Standards Authority of India (FSSAI), in a RTI response said, the Food Safety and Standards (Fortification of Foods) Regulations,

2018 are “VOLUNTARY” and based on the scientific evidence examined by the Scientific Panel, endorsed by the Scientific Committee and approved by the Food Authority, which again is opposed to the present idea of ‘mandatory’ food fortification.

An independent study by ICRISAT, Unicef, Organization for Advanced and Integrated Research, Kobe University, Japan and Akshaya Patra Foundation, Bangalore, India has done a comparative study of Mid Day Meal participant adolescents consuming Fortified Rice and Millets. The study concluded that the introduction of millet-based meals in school feeding programs can significantly improve the nutritional outcome of school going children compared to fortified rice-based meals.

### **Nutritional security vis a vis Food Security:**

The twin concept of Food and Nutritional security needs a close analysis in relation to each other in order to understand the food fortification process. The steep persistence of under-nutrition in India, even with rise in food security net is a cause of worry. It is evident from the fact that even when a large section of the population has been taken out of poverty, stunting, underweight and other chronic problems remain prevalent due to undernutrition.

Malnutrition remains one of the biggest reasons limiting human resource development in India. The latest report of Food and Agriculture Organisation (FAO) on food security and nutrition titled The State of Food Security and Nutrition in the World 2021 also proves the stagnant malnutrition which is existent in India.

India remains one of the most undernourished countries with 15.3% of population during 2018-20 against the global average of 8.9% during the same period. Similarly, 31% of children are stunted and 17.3% of children under the age of five years are wasted, the highest among countries. The prevalence of anaemia among women of reproductive age remains 53%. In this way, India remains home to the largest population of undernourished in the world(11).

Therefore, any policy devised for ensuring food security has to be framed in a way that it also promotes nutritional security for a longer term. It takes into account the diversity of indigenous crops in the country and does not harm health and biodiversity and also protects the interests of farmers.

### **Reports on Anaemia shows it has become more persistent:**

As per the findings of the recently released NFHS-5, the prevalence of anaemia amongst children under five years of age rose to 67.1 % which was 58.6 % in the NFHS-4 survey. India also witnessed a rise in anemia amongst women to 57 % from 53.1 % compared to the last survey. The prevalence of anemia amongst teenage girls (15-19 years) rose to 59.1 % from 54.1 %(12).

This surprising aggravation of anaemia happens even with multiple health programmes targeted for its elimination proves the failure of these programmes(13).

Anaemia presents a peculiar case where it remains a cause of grave concern even after implementation of multiple programmes dedicated to its eradication. The Union Health Ministry under the National Health Mission also started distribution of the Weekly Iron and Folic Acid

Supplementation (WIFS) Programme in 2012. This programme was framed to target the school going boys and girls and out of school adolescent girls. Using a fixed day approach, iron supplement tablets were given to increase the intake of iron and folic acid in them. As per the data provided by the government website, this programme has 11.2 crore beneficiaries covering 8.4 crore in-school and 2.8 crore out of school beneficiaries(14).

Juxtaposing the data of beneficiaries with the figures coming from recently released NFHS-5 survey, the failure of these targeted health programmes could be analysed. From health to awareness programmes to food security net, India`s fight against anaemia is a paradigm of policy and implementation level failure. Even after these steps, the burden of anaemia has increased in India speakers volumes about the policy paralysis. This is also a cautionary story for any of the policies including rice fortification formulated as a solution to India`s nutritional deficiency.

### **Injecting nutrition:**

Experts point towards possible ramifications of mandatory food fortification:

**Dr Sylvia Karpagam**, a leading public health expert says: “Rice fortification program announced by the government is not going to uplift the nutritional value in the diet. It cannot combat malnutrition in India as it requires enhancing the overall nutritional status of diet which isn't the goal of fortification. Adding certain nutrients like B12, folic acid etc cannot contribute to the overall rise in the nutritional intake of the population.

Premixing of micronutrients is opening a profitable market for the corporates of India as well abroad. The (un)scientific logic of fortification of rice shown as the most cost effective way to tackle malnutrition is also classist and casteist in nature. It is coming from a caste corporate nexus. While introducing indigenous crops and diversity, millets and animal sources which have comparatively higher nutritional value must be considered.”

**Dr Veena Shatrugna**, Former Deputy Director of the National Institute of Nutrition says:

“The fortification project is not formulated from a medical science point of view. Any one food item cannot provide all adequate nutrition. Solutions to anemia, hunger and malnutrition can only be resolved by introducing nutritious food items like several cereals, pulses, fruits and even animal diets into the diet rather than looking for a one bullet solution like fortification.

The absence of experts from the medical community in the committee overseeing the fortification program is also one of the reasons why such unscientific decisions are heralded. I appeal to the scientific community and health experts to come forward in denouncing such kind of pseudo scientific corporate blacked schemes.”

### **One size does not fit all:**

The rice fortification project mandates its fortification with Vitamin B12, Iron and folic acid. The mandatory rice fortification is done with the tendency which predicts somewhat homogeneous nutrient needs across the different groups of population which is scientifically problematic. Everyone does not require the same amount of micronutrients as the need is based on the deficit. The micronutrients intake also happens

through different food one consumes in diet. Iron fortification in rice can give an excess amount of iron then required by the body which can be unhealthy for them. The mandatory fortification can thus lead to dumping of unrequired and excessive nutrients into the food and can have other health consequences.

As the government suggests, the proposed institutionalisation of rice fortification is being done with the target of combating chronic anaemia as well as other micronutrient malnutrition. It is noteworthy that all cases of anaemia are not due to deficiency of iron but many other micronutrients. Hence the emphasis only on iron would not mitigate anaemia(15).

The logic of fortifying rice for fighting anaemia and other deficiency has already been red flagged by several nutritionists and health experts. American Journal of Clinical Nutrition in July 2021, said, the decision of compulsory rice fortification is ignorant regarding the pivotal role of dietary diversity in addressing the problem of nutritional deficiency. The paper, having opinions of around 18 experts, also cautioned about the fortification program and maintained that very little difference could be made possible through fortification of rice without diversifying the diet(16).

### **Benevolence of corporations?**

When the government themselves find dietary diversity and introduction of nutrient rich food in the diet to be the best way in enhancing the nutritional level in the population, why do they continue to promote the fortification in the process?(17) Government agencies back their move by claiming that the fortification process remains one of the cheapest ways through which substantive levels of micronutrients can be mixed in any popular staple diets. It can also produce immediate results. In India, rice comes fifth after salt, edible oil, milk and wheat which

has received government nod for fortification. Its mandatory fortification for the rice distributed under social safety net in the coming years makes it an emerging market from where corporates can smuggle voluminous profit. The micronutrients required in the fortification process has a global monopoly of certain specific corporations.

As per media reports, the proposed rice fortification program in India will create a market of around Rs. 1700 crore for corporates. Manufacturing of fortified rice is an expensive business in comparison to other food items. This is implied in the process that rice fortification remains then a promising market for the global capitalists(18).

Big organizations like Tata Trusts have already collaborated and are working with the government in multiple rice fortification drives in different parts of India(19). Also the oligarchal business conduct of micronutrients supply also leverages the firms to increase the prices in an arbitrary way, reaping excessive profit.

### **Already available alternatives to the mandatory rice fortification:**

#### **Reintroducing Millets in diet of people:**

India is a country with a diverse food production pattern. Millets amongst them could be a viable alternative to the proposed mandatory rice fortification. Millets, also known as ancient grains, are rich in nutritional value and have a history of over 3000 years of cultivation. An accessible source to carbohydrate, protein and other nutrition, millets remain realistic and a go-to diet in fighting malnutrition. Due to the Green Revolution India witnessed a bumper boom in the food production but this came as the cost of large scale chemical induced farming, usage of hybrid seeds, fertilizers and pests. Also came the loss of the production and consumption of diverse foods including millets as it somehow brought a homogeneous cropping pattern in the



agrarian landscape of the country. The production and consumption of millets as a food item reduced which was high in the pre Green Revolution phase.

India still remains the leading producer of Millets in the world. Millets are low input crop and need less amount of water in its production. While rice needs around 5000 litre of water for one kilogram of production, millets just need 250-300. The initiation of millet production can tackle groundwater depletion. So a more nutritious, diverse, sustainable and climate friendly diet could be achieved with millets.

Odisha Millet mission exhibits the success of millet production and the fight against the climate vulnerability. As a form of sustainable farming, the production of millets can achieve milestones in increasing nutrition in the diet as well as combating the climate catastrophe.

Chhattisgarh also launched the Millet mission in 2021, aiming to become the Millet hub of the country. The government is working to encourage millet production by making available high quality seeds to farmers, training as Krishi Vigyan Kendra and ensuring government procurement of the produce.

The Tamil Nadu government has also decided to sell millets and value-added millet products in fair price shops run by cooperative and civil supplies departments. The products will be sold in Chennai and Coimbatore as a pilot project(20).

Millets show us a viable alternative for providing a nutrition rich diet as well as dealing effectively with the climate crisis.

### **Focus on dietary diversity:**

The battle against malnutrition and the way forward towards nutritional security need a long term sustainable plan.

Compulsory fortification has been endorsed historically by many countries to proper the nutritional intake of the population. But even when fortification remains one of the popularly opted plans against malnutrition, dietary diversity remains the most sustainable and long term program to tackle the problem of malnutrition. Dietary diversification becomes more important in the case of India owing to the pluralist food culture it has. The difference of the culinary culture across the country is to be taken into consideration while planning any kind of nutritional security program in order to make it successful. The rationale behind the fortification of rice is that it is the most popular staple diet which is consumed by almost 65% of the population. It is highly accessible to the people of lowest strata as the governmental food security net distributes rice under multiple programs like pds, mid day meal etc. Herein lies the point of diversification of diet, as rice is not consumed by almost the total population either. Neither their food culture includes rice as an important staple. Dietary diversity not only promotes a healthy and more natural form of nutritional intake but it also takes into account the local food culture and remains a more direct intervention towards nutritional security.

Preference shall be given to the locally available and preferred food item. The production and availability of those items shall be augmented to promote and protect the diverse food culture instead of relying just on rice for reducing the deficient nutritional intake. Food items like pulses, oil seeds, millets, vegetables, fruits, milk, meat, fish and poultry shall be promoted. Different kinds of vegetables and fruits which are produced in a particular geographical area and are nutrient rich shall be considered widely for inclusion.

The non-homogeneous food culture of India could be a catalyst for a long term and sustainable process to promote nutritional security amongst the population rather than an obstacle. It just

needs the required dedication and ground level work from the agencies of state along with better coordination with the indigenous population. It will also promote the preservation of indigenous food culture and motivate the farmers to opt for production indigenous food items.

### **Nutrition Kitchen Gardens:**

Another alternative that can be practised is creation of decentralized and community owned Nutritional Kitchen Gardens. Nutritional Kitchen Garden grows a wide array of nutritious food, vegetables and fruits are produced. The farming is done totally through organic means and does not involve any chemical fertiliser and pesticides. It provides an alternative to enrich nutrition in diet and make it more healthy. It can be promoted as an alternative natural medium to promote a self-reliant food and nutritional security in the country.

Nutritional Kitchen Gardens are seen as a promising option to bring a community level change in the nutritional level and also enhance the dietary diversity. It also helps in creating an awareness regarding nutritional diets and food preference as well as allows people to bank on local sources of high nutrition food rather than to be dependent on artificial fortification based diets(21). It remains a viable option against the fertiliser driven chemical farming which deteriorates soil health as well as gives nutrient deficient produce.

Greenpeace India is currently working in collaboration with Bihar Jeevika, to establish organic kitchen gardens with over 150 women farmers from vulnerable communities. They grow over 20 varieties of crops. Witnessing the success of the organic kitchen garden project, the government has decided to pilot the project with over 5000 families across the Jamui district of Bihar(22).

These gardens have not only positively contributed in the

income generation but have also provided them with a sustainable and nutrition rich diet improving the health of people. Worth mentioning these gardens are sustainable way forwards against climate change and environmental degradation.

### **Custodians of Rice aka Rice Heroes:**

The preservation of seed diversity of paddy crops is also one the way forward towards promoting dietary diversity. Due to fundamental change in farming pattern by introduction of hybrid and genetically modified seeds many seed varieties were eliminated from the cropping cycle and production.

In a time where genetically modified and hybridised seeds are promoted for higher yield, there are many rice heroes working for conservation of endangered and nearly extinct indigeneous varieties of rice that can help in the reintroduction process of these seeds. They are also suitable as per the different climatic conditions as per geography.

Due to push towards use of these varieties of seeds, not only the local and diverse kind of seeds got out of farming cycle but their availability also became scarce. There is a long list of these rice heroes but we are able to highlight some of them in the report.

### **Debal Deb:**

An ecologist and scientist and a conservator of indigenous varieties of seeds, Debal Deb is one of the few persons who have dedicated their life in the conservation of the rice diversity in India. In a time period spanning over 25 years, he has been able to conserve around 1420 varieties of native variety of rice, as per a report.

These rice varieties are at the verge of extinction and many others have already gone extinct. He took the task of conservation after witnessing the wipe out of native rice variety which received no positive notice from government agencies and agri scientists. He travelled for years in the remotest areas of various states like West Bengal, Odisha. He has done the collection of these native varieties of seeds in 12 states as well as other countries like Sri Lanka, Pakistan etc. He cultivates all these rice varieties in his farmland(23).

### **Mohan Chandra Borah:**

An Assamese farmer, Mohan Chandra Borah is another rice warrior who is stocking up the near extinct and endangered varieties of native rice. He has also established a library named 'Annapurna'. It is said to be the first of its kind in northeast India. It is an indigenous seed saving library which works to collect and promote the cultivation of these diverse and endangered rice varieties. He started collecting seeds and now he has more than 250 varieties of seeds, most of them from northeast India. He also mentions higher prevalence of hybrid seeds which got the indigenous variety of seeds rejected from farmers, owing to lesser productivity(24). While talking to Greenpeace, Borah said that the Rice fortification scheme is formulated to provide profuse profit to the corporates and isn't going to benefit in the fight against malnutrition. He also told the benefits of the indigenous seeds of rice which are far rich in terms of nutritional benefit.

There are many other rice heroes who are preserving the near to extinct varieties of rice seeds and trying to promote their plantation too. The Green revolution has increased productivity but these lab modified hybrid seeds have also reduced the nutritional content of it. Native rice has a far better nutritional component which is also suitable with an area specific climatic condition in which it is grown.

The diversity of rice varieties in India had nearly 1,00,000 varieties of rice in the 1970s which has been reduced to nearly 6,000. It is one of the devastating results of the green revolution which focused on mono culture and hybrid crops(25). Health experts and scientists have already shown their concern regarding the proposed mandatory fortification program. It can lead to severe effects on health including diseases like diabetes, cholesterol etc(26).

It is evident that encouraging the wide variety of indigenous paddy seeds can be a promising solution to the pervasive malnutrition as well as hunger. It will also lead to a sustainable form of farming which will be inclusive and chemical free.

### **Conclusion:**

Artificially injected nutrients through chemical fortification is a less tested solution than increasing the dietary diversity to control undernutrition and malnutrition. Hence forcing a huge number of women and children to unknowingly consume chemically fortified rice is like devoiding them of their right to choose and aware consumption apart from exposing them to unknown health and wellness related ramifications.

When the country already has enough diversified and indigenous food practices which can address the problem in a much better and sustained way by not only supporting farmers but also the consumers, the gigantic task of investing massive public money into fortification is ridiculous.



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