ADEQUATE NUTRITION FOR WOMEN AND CHILDREN

The importance of adequate nutrition for women and children cannot be compromised. Women's nutrition directly influences their own health, which in turn affects the well-being of their children and the family as a whole. Insufficient quantity and quality of balanced diets can lead to malnutrition, deficiency diseases, and other illness/disorder as well as lower life expectancy.

- In India, women face several nutritional challenges throughout their lifetime. As per the latest National Family Health Survey 2019-21 **(NFHS-5)**, 18.7% women in the reproductive age group (15-49 years) have a body mass index below normal (BMI<18.5 kg/m²) and **57% of them suffer from anaemia.** This indicates high levels of under-malnutrition which are associated with their poor nutritional intakes.

Age Group		Body Weight (kg)	Estimated Average Requirements (EAR)					
			Energy		Protein		Visible Fat	
			(kcal/day)	Kcal/kg body wt./ day	(g/day)	g/kg body wt./day	(g/day)	g/kg body wt./day
Adult Men	Sedentary activity	65 *(100%)**	2110	32	43.0	0.66	25	0.38
	Moderate activity		2710	42			30	0.46
	Heavy activity		3470	53			40	0.61
Adult Women	Sedentary activity	55 *(84.6%)**	1660	30	36.0	0.66	20	0.36
	Moderate activity		2130	39			25	0.45
	Heavy activity		2720	49			30	0.54
Children (1-3 yrs)		12.9 *(19.8%)**	1110	83	10.0	0.79	Not listed	Not listed
Adolescent Girls (13-15 yrs)		49.6 *(76.3%)**	2400	49	35.0	0.70	40	0.81

Table 1: Estimated Average Daily Requirement of Energy, Protein and Visible Fat for Men, Women, Children & Adolescent Girls

- Further, the NFHS-5 data also reveals that of the children aged less than five years, nearly **35.5% are stunted (low height-for-age), 19.3% and 7.7% wasted/severely wasted (low weight-for- height) and 32.1% underweight (low weight-for-age);** this again highlights an alarmingly high prevalence of malnutrition among children.
- In India, unhealthy dietary patterns and nutritional deficiencies remain a public health problem; and achieving food, nutrition, and health security is a major challenge. The National Nutrition Policy (1993) and the National Plan of Action on Nutrition (1995) have laid sufficient stress on the importance of adequate nutrition for women and children. But in recent years, there have been much more concerted efforts in this direction.
- For making India **"Kuposhan Mukt**", in 2017, NITI Aayog drew up the **National Nutrition Strategy document** entitled "*Nourishing India*" This document emphasises on the importance of reducing/preventing undernutrition across the life cycle, especially during the first three years of life, so as to prevent irreversible and cumulative growth/ development deficits compromising their health and survival.
- Prime Minister's complete scheme for holistic Nutrition- **POSHAN Abhiyan**, the flagship programme of the Ministry of Women and Child Development (GoI) is implemented in a mission mode for improving the nutritional outcomes of children, pregnant women, and lactating mothers.
    - It involved convergence of various programmes, such as Integrated Child Development Services (ICDS), Pradhan Mantri Matru Vandana Yojana (PMMVY), Scheme for Adolescent Girls (SAG), Janani Suraksha Yojana (ISY), National Health Mission (NHM), Swachh Bharat Mission, Public Distribution System (PDS), MGNREGS, and initiatives of the Ministry of Drinking Water & Sanitation.
- In 2022, the Government of India approved the Integrated Nutrition Support Programme "**Saksham Anganwadis and POSHAN 2.0**" which seeks to address the challenges of malnutrition in children (till 6 years), adolescent girls (14-18 years), pregnant women and lactating mothers through a strategic shift in nutrition content and delivery of services.
- The Anganwadi Services of ICDS Scheme for Adolescent Girls, and POSHAN Abhiyan have been realigned under POSHAN 2.0 for maximising the nutritional outcomes.

- It focuses on Maternal Nutrition, Infant, and Young Child Feeding Norms, Treatment of Moderate Acute /Severe Acute Malnutrition (MAM/SAM) and Wellness through AYUSH practices for reducing the prevalence of wasting and underweight besides stunting and anaemia.
- The **Poshan Tracker** - a governance tool by the MoWCD (2021) is envisaged to bring transparency and strengthen the nutrition delivery support systems. Apart from tracking nutrition service delivery, technology is being used for the identification of stunting, wasting, and underweight among children.

PROMOTING HOUSEHOLD FOOD AND NUTRITION SECURITY

Food security and nutrition are closely interlinked. The causes of food and nutrition insecurity are complex, interconnected, and derive from structural and economic constraints. Poverty is the root cause of nutrition insecurity. Lack of access to education, affordable housing, healthcare, transportation, employment, and living wages can impact a household's ability to access adequate and nutritious food.

Pillars of Food And Nutrition Security

The pillars of household food and nutrition security encompass a range of interconnected factors that contribute to ensuring that households have access to sufficient, safe, and nutritious food. These pillars are -

1. **Food Availability**: This pillar focuses on ensuring an adequate and consistent supply of diverse food options. It encompasses aspects such as agricultural productivity, sustainable farming practices, and efficient food production systems.
2. **Food Access**: This refers to the ability of individuals and households to obtain sufficient food for a nutritious diet. It includes factors such as affordability, physical access to markets, infrastructure for storage and transportation, and social safety nets.
3. **Food Utilisation**: It involves addressing issues like dietary diversity, nutritional education, safe food handling/preparation, and access to clean water and sanitation facilities. Promoting food utilisation requires nutrition education campaigns, behaviour change communication, micronutrient fortification, hygiene and sanitation programmes.
4. **Food Stability**: This refers to the ability of households to maintain access to food during shocks and crises. It involves building resilience and reducing vulnerability to natural disasters, price fluctuations, & economic shocks.
5. **Governance and Policy**: It involves development and implementation of coherent policies, strategies, and programmes that address all dimensions of food security. This includes policies related to agriculture, trade, social protection, health, education, and environmental sustainability.
6. **Empowerment and Capacity Building**: It plays a crucial role in enhancing household food and nutrition security. It involves empowering individuals and communities to make informed decisions about food choices, promoting gender equality, and strengthening local institutions and community participation.

Methods That Can Ensure Food And Nutrition Security

1. **Sustainable Agriculture Practices**: This involves promoting sustainable farming practices that enhance agricultural productivity while minimising environmental impact. It includes adopting agroecological approaches, organic farming, conservation agriculture, and precision farming techniques.
2. **Diversification of Food Production**: This includes promoting traditional and underutilised crops, horticulture, agroforestry, and aquaculture.

Dietary Diversification To Enhance Food And Nutrition Security

Dietary diversification is crucial for enhancing household food and nutrition security in India. Dietary diversification refers to the inclusion of a wide variety of foods from different food groups to ensure a balanced and nutrient-rich diet. Here are strategies to promote dietary diversification:

- Nutrition education and awareness through public campaigns, school programmes, community workshops.
- Promoting local and traditional foods through organising festivals and events that celebrate local and traditional foods, promoting their cultural significance, nutritional value; and collaborations with local farmers and food producers.
- Promoting the cultivation of diverse crops, including traditional and underutilised crops; home gardening; sustainable farming practices.
- Developing and implementing policies that prioritise nutrition-sensitive agriculture, food production, and distribution, promoting dietary diversification, and addressing food and nutrition security at a systemic level.
- Encouraging food fortification programmes to enhance the nutritional content of staple foods. Food fortification is a strategy aimed at enhancing the nutritional value of food by adding essential vitamins, minerals and other nutrients. It plays a crucial role in attaining household food and nutrition security in light of the following points: Enhanced nutrient content, address micronutrient deficiencies, Targeted approach, effective public health intervention, National/global support and recognition etc.

3. **Enhancing Access to Inputs and Technologies**: This includes promoting the development and dissemination of improved crop varieties, resilient seeds, and appropriate technologies for smallholder farmers.
4. **Social Protection Programmes**: It includes implementing targeted social protection programmes to address immediate food needs and reduce vulnerability. This includes programmes such as subsidised food distribution, school feeding programmes, conditional cash transfers, and public works programmes.
5. **Nutrition Education and Behaviour Change**: This implies promoting nutrition education and behaviour change communication to improve household dietary practices and also raising awareness about the importance of diverse and nutritious diets, promoting breastfeeding, hygiene, and sanitation practices, and addressing cultural and social norms related to food and nutrition.
6. **Strengthening Health and Nutrition Services**: This refers to enhancing access to quality health and nutrition services, particularly for women, children, and vulnerable groups. This includes improving antenatal and postnatal care, promoting breastfeeding practices, providing micronutrient supplementation, and addressing malnutrition through community-based nutrition programmes.
7. **Policy and Governance**: This comprise of developing and implementing policies and governance frameworks that prioritise food and nutrition security. This includes integrating food security into national development plans, establishing regulatory mechanisms, enhancing coordination among relevant ministries and agencies.
8. **Research and Innovation**: It involves investing in research and innovation to generate knowledge, develop technologies, and address emerging challenges in food and nutrition security. This includes conducting research on climate-smart agriculture, nutrition-sensitive interventions, and sustainable food production systems.

Food And Nutrition Security Is Also Crucial For Meeting SDGs

The SDGs provide a comprehensive framework to address various dimensions of development, including hunger eradication, nutrition improvement, sustainable agriculture, and poverty reduction. Following are the ways and means how promoting household food and nutrition security in India contributes to SDGs:

- **SDG 1: No Poverty** - Household food and nutrition security play a vital role in poverty reduction. By ensuring access to sufficient, nutritious food, vulnerable households can break the cycle of poverty, improve their health and productivity, and enhance their overall well-being.
- **SDG 2: Zero Hunger** - This includes achieving targets related to ending all forms of malnutrition, promoting sustainable agriculture, and increasing agricultural productivity.

- **SDG 3: Good Health and Well-being** - Promoting household food and nutrition security contributes to reducing undernutrition, stunting, wasting, and micronutrient deficiencies, leading to improved overall health and well-being, and addressing targets under SDG 3.
- **SDG 5: Gender Equality**- Household food and nutrition security can help address gender inequalities. Women and girls often bear the primary responsibility for food preparation and household nutrition. Empowering women with knowledge, resources, and decision-making power in food production and consumption can contribute to achieving gender equality.
- **SDG 12: Responsible Consumption and Production**- Promoting sustainable agriculture practices and diversifying diets align with SDG 12. By encouraging the production and consumption of diverse and locally grown foods, India can reduce food waste, conserve biodiversity, promote sustainable farming methods, and minimise the environmental impact of agriculture.
- **SDG 13: Climate Action** -Household food and nutrition security strategies should be aligned with climate action goals. Promoting climate- smart agriculture, agroforestry, and sustainable farming practices can enhance resilience to climate change, reduce greenhouse gas emissions, and mitigate the environmental impact of agriculture.
- **SDG 17: Partnerships for the Goals** - Achieving household food and nutrition security require strong multi-stakeholder partnerships. Collaboration between governments, civil society organisations, research institutions, and the private sector is essential for implementing effective policies, programmes, and initiatives to address food and nutrition security in India.

Various Governmental Initiatives For Promoting Food And Nutrition Security

- The **National Food Security Act (NFSA, 2013)** aimed to provide for food and nutritional security by ensuring access to adequate quantities of quality food at affordable prices. India has transitioned from being a food-deficit nation to a self-sufficient food-producing country in the last 30 years.
- A new *Integrated Food Security Scheme* has been approved to provide free food grains to Antyodaya Anna Yojana (AAY) and Primary Household (PHH) beneficiaries from 1 January 2023. The new scheme has been named **Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY)**. Free food grains for the year 2023 will be provided to all PHH and AAY beneficiaries under PMGKAY.
    - This integrated scheme will strengthen the provisions of NFSA-2013 in terms of access, affordability, and availability of food grains to the poor.
- Under the **Pradhan Mantri Matru Vandana Yojana**, registered women have been provided Rs 5000/- on the birth of their first child for wage support and nutritious food during pregnancy and post-delivery period.
- To strengthen the efforts of the Government to address malnutrition in the country and to involve the country's wide population through a Jan Andolan, the **Poshan Maah** is celebrated every year.
- In India, millets were traditionally consumed, but due to the push given to food security through Green Revolution (1960s), millets were rendered as 'orphan crops' - less consumed and almost forgotten. However, the Government of India realised the importance of millets in building nutritional security in the country and made several efforts such as gazetting millets as *Nutri-Cereals, the celebration of the National Year of Millets in 2018 and proposing to UN, the International Year of Millets (2023).*
    - Millets have substantially higher amounts of minerals like calcium, potassium, magnesium, iron, manganese, zinc, and B complex vitamins, making them a preferable choice over the cereal grains.
    - Millets can also help tackle health challenges, such as obesity, diabetes and lifestyle problems, as they are gluten-free, have a low glycaemic index, and are high in dietary fibre and antioxidants.

Promoting household food and nutrition security is a multifaceted endeavour that requires concerted efforts from various stakeholders. It involves addressing factors such as availability, accessibility, utilisation, and stability of food, as well as ensuring nutritional adequacy and dietary diversity.

NUTRITION AND HEALTH IN SCHOOL EDUCATION

Good health and nutrition lay the foundation for learning and are an essential investment in the development of a more sustainable and inclusive future for children.

Status of Health and Nutrition in Schools

The Global School health and nutrition aims to protect and promote the physical and mental health, nutrition, well-being, and development of school- age children and adolescents and the wider school community through coordinated and comprehensive strategies, activities, and services that are integrated and sustained within the education system (UNESCO, GPE et al., 2020). The essential elements include:

- Policies and laws that provide an enabling environment at national, subnational, and school Levels.
- Education for health and well-being delivered through skills-based school curricula and extracurricular activities.
- A school physical and socio-emotional environment that is safe, inclusive, and conducive to health, well being, and learning.
- School health and nutrition services and school feeding programmes that provide simple, safe and effective health interventions, and healthy school meals.

According to the recently released report '**Ready To Learn And Thrive'**, which highlights the significant impact and high returns of investments in school health and nutrition programmes, and urges governments to scale up their efforts to provide comprehensive and inclusive set of interventions. The major findings of the report are:

- 9 in 10 countries in the world currently implement School Health and Nutrition programmes.
- 3 in 5 countries include food and nutrition education.
- More than 100 countries have school-based vaccination programmes.
- 9 in 10 include physical education as a compulsory school curriculum subject.
- 80% of countries now have a school feeding policy.
- 388 million children in 161 countries - nearly half of all children enrolled in primary schools receive school meals.

Policy Perspective on Health and Nutrition in Schools

- Governments have realised that these initiatives are wise investments since they improve Students' health, nutrition, and learning outcomes while also significantly advancing their communities and countries (UNESCO, 2023).
- The Covid-19 pandemic has highlighted the critical role that schools play in the physical and mental health, nutrition, and well-being of children and adolescents.
- **SDG 3** talks about ensuring healthy lives and promoting well-being for all ages, while **SDG 4** focuses on inclusive and equitable quality education and promoting lifelong learning opportunities for all.
- The **National Health Policy (NHP) 2017** also envisages the attainment of the highest possible level of health and well-being for all ages, through preventive and promotive health care.
- The **National Education Policy (NEP) 2020** takes a step towards integrating education and health to enable children to learn and grow as healthy individuals. The policy makes it mandatory for all students to acquire skills in the areas of health and nutrition, physical education, wellness, fitness, and sports.
    - NEP has recommended provision of early childhood care and education to children below 5 years of age in preparatory classes in primary schools, and extends the mid-day meal programme to these students.

Initiatives Undertaken in India

Some of the major initiatives undertaken by the Government of India are:

1. **Pradhan Mantri Poshan Shakti Nirman (PM POSHAN):** The scheme is one of the foremost rights based Centrally Sponsored Schemes under the National Food Security Act, 2013 (NFSA). Around 12 crore children studying in 10.84 lakh schools in all Government and Government-aided schools have been covered under the scheme across the country. As per the guidelines, the objectives of the scheme are to address two of the pressing problems for the majority of children in India, viz., hunger and education by:
   a) Improving the nutritional status of children studying in Bal Vatika and classes I - VIII in Government and Government-aided schools and Special Training Centres (STCs).
   b) Encouraging poor children, belonging to disadvantaged sections, to attend school more regularly and help them concentrate on classroom activities.
   c) Providing nutritional support to children of elementary stage in drought affected areas during summer vacation and during disaster times.
2. **School Health and Wellness Programme**
   - The School Health Programme under AYUSHMAN BHARAT is a joint collaborative programme between the Ministry of Health and Family Welfare and the Ministry of Education.
   - In every public school, two teachers- preferably one male and one female - are declared Health and Wellness Ambassadors (HWA) and trained to promote healthy lifestyles and disease prevention information through engaging weekly activities in the classroom.
   - To prevent anaemia among children, the programme also provides mid-day meals and weekly iron-folic acid supplementation including nutrition counselling, tobacco prevention, and life skills education.
3. **Mission Saksham Anganwadi and Poshan 2.0:**
   - The Ministry of Women and Child Development (MoWCD) is implementing an integrated nutrition support scheme called Saksham Anganwadi and POSHAN 2.0.
   - The schemes of Anganwadi Services, Scheme for Adolescent Girls, and Poshan Abhiyan have been realigned under the scheme to maximise nutritional outcomes. It has been organised to address three primary verticals: (i) nutritional support for women, children, and adolescent girls, (ii) early childhood care and education (3-6 years), and (iii) Anganwadi infrastructure including modernisation.
   - For capturing real-time data on the implementation and monitoring of Anganwadi Services across the country, a robust ICT-enabled platform named Poshan tracker has been designed.
4. **POSHAN Abhiyaan:** This was launched by the Prime Minister in 2018 to attain the goal of "**Suposhit Bharat**" in mission mode. The Abhiyaan aims to reduce malnutrition in the country with an aim to achieve improvement in nutritional status of Children aged 0-6 years, adolescent Girls, pregnant women and lactating mother in a time bound manner.
5. **Poshan Bhi, Padhai Bhi:** This scheme has been launched by MoWCD on 10 May 2023, which will focus on Early Childhood Care and Education (ECCE) covering 13 lakh Anganwadis across the country. The objective of this programme is to ensure holistic development of children under the age of 6 years, with focus on building skills in key development domains identified under NEP.

Paving the Way Ahead

A nation's future depends on its children because healthy children are the cornerstone of a healthy society. It has been acknowledged around the world that schools are an important setting where children develop behaviour skills for physical, emotional, and social well-being. Investing in health and nutrition interventions in schools serves to promote a well-nourished, healthy, and educated population, which can stimulate long-term growth and economic development. To ensure that children in India receive proper nutrition and health care, we must collaborate in more streamlined and integrated ways. By focusing on and contributing substantially to the health and nutrition of children in schools, we will offer a unique opportunity to transform education.

FOODS THAT ADDRESS NUTRITIONAL DEFICIENCIES

Over the last few years, India has been implementing several nutrition interventions as part of its national strategy to address malnutrition and its associated risks. These include the provision of food supplements, Iron and Folic Acid (IFA) supplementation during pregnancy, breastfeeding promotion, access to clean water, sanitation, etc.

The existing systems in both urban and rural areas are strategically placed to decentralise the efforts under POSHAN and move towards last-mile convergence for better nutrition service delivery. Elected bodies at the grassroots, SHGs consisting of community members, youth groups, Integrated Child Development Services (ICDS), and Anganwadi Centres, can be effectively leveraged for community mobilisation.

Most Common Nutritional Problems

- **Vitamin D Deficiency** - An important nutrient for maintaining bone health, vitamin D is a fat-soluble vitamin that is also known for preventing certain types of cancer. A deficiency of vitamin D can lead to osteoporosis, repeated fractures, and bone and muscle weakness.
- **Vitamin A Deficiency** - Vitamin A is essential for healthy vision, metabolism, and cell development. A major cause of vision loss and blindness, vitamin A deficiency can lead to certain complications with heart, lungs, skin, tissues, and immune system.
- **Vitamin C Deficiency**- It is essential for the absorption of iron in the body, which is used to make red blood cells. Vitamin C benefits the teeth, gums, skin, and tissue.
- **Vitamin B12 Deficiency** - In order to maintain a healthy nervous system, prevent mutations in the DNA, and induce the formation of red blood cells, vitamin B12 is extremely important. A lack of this vitamin can lead to atrophic gastritis, Crohn's disease, parasitic infections, celiac disease, or certain neurological symptoms.
- **Protein Deficiency**—Also known as the building blocks of body, proteins are essential to maintain muscle mass. Lack of protein can cause oedema of the legs, hands, and abdomen. It can also lead to mood changes, slow healing of wounds, preeclampsia, weakness, fatigue, etc.
- **Iron deficiency**- It is one of the most common nutritional problems in India. Its deficiency results in iron deficiency anaemia, fatigue, paleness, and shortness of breath.
- **Folate Deficiency**--Also known as vitamin B9, folate plays a vital role in DNA and RNA synthesis.
- **Iodine Deficiency**--The deficiency of iodine is known to cause impaired thyroid functioning, leading to hypothyroidism symptoms, such as weight gain, fatigue, dry skin, weakness, etc.

Addressing Food Deficiencies

Protein Deficiency

- Protein is an essential macronutrient for proper body functioning and is necessary for building and repairing muscle, producing hormones, and producing enzymes.
- Including a variety of protein-rich plant-based foods such as lentils, chickpeas, beans, soy products, and dairy can help vegetarians meet their daily protein requirements.

Calcium: Finding Alternative Sources Beyond Dairy

Calcium is a crucial nutrient for building and maintaining strong bones and teeth, and it is often associated with dairy products. There are several plant-based sources of calcium that can be easily incorporated into a vegetarian Indian diet.

Leafy Green Vegetables

Spinach, kale, and collard greens are excellent sources of calcium, as are other vegetables such as broccoli, okra, and bok choy. Tofu, a popular vegetarian protein source, can also be an excellent source of calcium, particularly if it has been fortified.

Iron Deficiencies

Consume iron-rich plant foods like spinach, legumes, nuts, seeds, and fortified cereals. Pairing these foods with vitamin C-rich foods, such as tomatoes, citrus fruits, or bell peppers, can enhance iron absorption.

Zinc

This can be found in whole grains, legumes, and nuts, while calcium is abundant in dairy products, green leafy vegetables, and fortified plant-based milk alternatives.

Essential Fatty Acids

- This is important for maintaining good health, as they provide the building blocks for many important hormones and help to reduce inflammation.
- A vegetarian Indian diet may be low in omega-3 fatty acids while high in omega-6 fatty acids.
- To balance the intake of these essential fats, incorporate omega-3 rich foods like flaxseeds, chia seeds, walnuts, and algae-based supplements.

Fibre

- To ensure adequate intake of whole grains and fibre, we should focus on eating foods such as oats, barley, brown rice, quinoa, whole wheat bread, and legumes. Additionally, incorporating foods such as fruits and vegetables can help to meet fibre needs.
- Whole grains like brown rice, whole wheat, and millets are packed with fibre, vitamins, and minerals. Including these in the diet can improve digestion, regulate blood sugar levels, and lower cholesterol.

Micro-Nutrients

The Government of India has launched several schemes and programmes in the wake of micronutrient deficiency. Food fortification, dietary diversification, nutritional education, micronutrient supplementation, maintenance of environmental sanitation, and hygiene are the various available measures taken to tackle the problem of micronutrient malnutrition.

Blue foods

Blue food, sourced from aquatic environments, can reduce nutritional deficiencies and contribute to employment and export revenue in India. Blue foods are important for the economies, livelihoods, nutritional security, and cultures of people in many countries.

Government Initiatives

- The Indian Council of Agricultural Research (ICAR) developed 79 biofortified varieties of various crops that are nutritionally rich and also launched two programmes, Nutri-sensitive Agricultural Resources and Innovations **(NARI)** and Value Addition and Technology Incubation Centres in Agriculture **(VATICA),** for upscaling biofortified varieties of crops through Krishi Vigyan Kendras.
- Millets are a good source of energy, carbohydrates, fats, proteins, soluble and insoluble fiber, antioxidants, iron, zinc and vitamins, and can help eliminate micronutrient deficiency in India and other developing nations. Today, there is a kind of revolution occurring in the wonder cereal--Millets - often called 'nutri-cereals' due to their high nutritional value.

MILLETS: FUTURE FOOD

Millet is a cereal grain that belongs to the Poaceae family, commonly known as the grass family. It is widely consumed in developing countries throughout Africa and Asia. While it may look like a seed, millet's nutritional profile is similar to that of sorghum and other cereals. Millet is no longer promoted as mota anaj, instead, it will be called **Shree anna, or nutri-cereal**, a superfood high in iron and calcium. The resilient grain also fits in well

with the current global climatic concerns - it consumes little water, has low carbon footprint, and grows in arid conditions.

The Year '2023' has been declared as the International Year of Millets. The declaration calls on all stakeholders to provide support to 'activities aimed at raising awareness of and directing policy attention to the nutritional and health benefits of millet consumption and their suitability for cultivation under adverse and changing climatic conditions, while also directing policy attention to improving value chain efficiencies.

A Smart Food

- Millets are an important staple cereal crop for millions of smallholder dryland farmers across Asia and sub-Saharan Africa.
- They are also called nutri-cereals or dryland cereals, and include sorghum (jowar), pearl millet (bajra), finger millet (ragi), foxtail millet (kangni), proso millet (chena), barnyard millet (samvatke chawal) and kodo millet (kodon), and offer high nutritional benefits.
- Millets are also referred to as Smart Food, which are good for the consumers, the planet and the farmers.
- They are climate-smart and hence constitute a good risk management strategy for farmers as compared to rice and wheat crops, which require higher quantities of water and fertiliser supplements.

Boost Production

- In India, traces of millets have been found in the archaeological sites of Harappa and Mohenjodaro, and several ancient Indian scriptures make references to millets.
- Today, there is a growing realisation among Indian farmers that cultivating millets requires fewer inputs and it is also an economically viable option, especially in harsh and dry environments.
- The Union Government of India, headed by the Prime Minister Narendra Modi, had declared 2018 as the National Year of Millets to boost production of the nutrient-rich grains.
- For many generations, millets were a regular part of the diet. These grains are rich in many essential nutrients for nutrition and health. A variety of cuisines can be prepared, like Millet cheela, Millet Dosa, Millet Momos, Millet Pizzas, Millet manchuria, Pasta, Idli, and Kodo Biryani.
- The Indian Government is leading a global movement for the UN International Year of Millets in 2023. This initiative is being followed up with the 'Millet Mission'. (International Crops Research Institute for the Semi-Arid Tropics) ICRISAT-founded Smart Food initiative is advocating demand driven by strengthening of millet and sorghum value chains.
- World Food India 2023 is expected to be held at Pragati Maidan in Nov' 2023. MILLIND, the new avatar for the futuristic spirit of India's Food Processing Industry, which comprises two parts: Mill- from Millets representing the 'International Year of Millets' And Ind-As in India, the potential Food basket of the World!

Iron Deficiency

- A new study has shown that regular consumption of millets can improve haemoglobin and serum ferritin levels to reduce iron deficiency anaemia, which is rising globally.
- The recently published research, a meta- analysis of 22 studies on humans and eight laboratory studies on millets consumption and anaemia, was undertaken by seven organisations across four countries and was led by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).
- The study concluded that millets can provide all or most of the daily dietary iron requirements of an average person. The results of the meta-analysis based on 19 efficacy studies conducted on anaemic individuals clearly indicate that including millets in our daily diets, as a meal or beverage, decreases anaemia.

With the support of world leaders and initiation of the Indian Government, millets, the superfood will become the future food in the coming years and witness the World Food Basket to reach out many in have not countries, by fulfilling the objectives of Sustainable Development Goals and aspirations of global living beings.

NUTRITIONAL MANAGEMENT FRAMEWORK FOR RURAL INDIA

The universal human needs revolve around food, clothing, health, and shelter in any country. Food and nutrition are critical to human development, which is much needed for maintaining good health, enhancing productivity, and enabling socio-economic development.

Why Nutrition Matters

- Nutrition refers to the process of consuming food and converting it into the sources of energy and other essential nutrients/vitamins required for life.
- The key nutrients of nutrition include protein, carbohydrates, fats, minerals, vitamins, and fibre/roughage.
- Malnutrition in its all forms, directly poses great challenges to health and livelihood, and indirectly presents a threat to fiscal imbalance due to its cost involved.
- In the development agenda, the nutrition interventions for vulnerable groups is of utmost importance which includes women, children, lactating women, adolescent girls, etc.
- The incidence and the impact of malnutrition and under-nutrition is found to be higher in the rural areas, in tribal areas, and in the urban slums of India including most people under the BPL (below poverty line).
- Thus, the holistic management of nutrition, health and well-being has emerged as a significantly important dimension, especially for the women and children in rural India.

Initiatives by the Government

- Government has been making dedicated and concerted efforts to reduce malnutrition and under-nutrition in the country.
- A variety of initiatives have been taken, such as *Integrated Child Development Services (ICDS), POSHAN Abhiyaan, POSHAN Abhiyaan 2.0, AYUSH (Ayurveda, Yoga, Unani, Siddha and Homeopathy)* etc.
- The Ministry of Women and Child Development has introduced the **'National Nutrition Mission (NNM)'** across approximately 583 districts.
- **'Nutrify India Now',** a mobile-app developed by the NIN, is guiding to assess the nutrients from variety of foods consumed.
- Holistic nutrition management essentially requires real-time and reliable data at all (village, block, district, state & centre) levels. **Three dashboards** viz., 'Anemia Mukt Bharat Dashboard', 'Jan Andolan Dashboard' and 'Nutrition India' provide much-needed information about malnutrition and create awareness of best practices to manage the malnutrition.
    - This tech-enabled system furnishes data and trends at district, state, and national levels, thereby facilitating effective management and monitoring of the interventions by GoI.
- Nutritional education programmes are also undertaken by government to encourage appropriate dietary intake and healthy lifestyles, especially in the rural areas, tribal areas and in the urban slums.
- On the overall, it can be observed that a variety of institutional initiatives, interventions, and projects of GoI together have brought-in a tremendous transformation in the entire nutrition management ecosystem.

Way Forward

- Central and State Governments have done adequately to manage the health and nutritional aspects through institutional mechanisms and collaborative interventions, which are constantly evolving.
- The success of all the initiatives and interventions undertaken by the government for nutrition, health, and wellness significantly depends upon the engagement and commitment levels of all stakeholders, including field functionaries, beneficiaries, community and policy makers at large.
- The success of national nutritional initiatives/ policies predominantly depends upon food policy, education policy, health policy, agriculture policy and rural development programmes.

RISING MATERIAL OBESITY: IMPLICATION AND WAY FORWARD

Obesity has become the most common medical condition in women of reproductive age, and the rise in prevalence of obesity is seen in both high-income countries and low- and middle-income countries (LMICS).

Prevalence of Maternal Obesity in India

- In India, 24% of women in the age group of 15-49 years are overweight or obese.
- A study conducted by Chopra et al. (2020) based on NFHS - 4 population estimates reported that among pregnant women, the prevalence of obesity was over 40% in 31 districts, with the highest prevalence of 72% in Shopian district (Jammu and Kashmir).
- The prevalence of obesity among postpartum women was over 40% in 37 districts, with the highest prevalence of 61% in Pathanamthitta district (Kerala).
- Another study conducted by Luhar et al. (2020) has forecasted the prevalence of obesity in India in the year 2040. Using simulation models, they have reported that the prevalence of overweight and obesity is forecasted to remain higher in urban areas, compared with rural areas, reaching 32.3% (27.8% - 37.1%) and 19.7% (14.0% - 24.5%), respectively among urban women by 2040.

Complications Associated with Maternal Obesity

- Obesity during pregnancy is linked to an increased risk of gestational diabetes (GDM), preeclampsia, miscarriage, venous thromboembolism, infection, and haemorrhage in the mother.
- Obese women may be subjected to nutrient-poor but energy-dense diets, which may contribute to bad pregnancy outcomes.
- Intrauterine hyperglycemia (in GDM) and hypertension can harm foetal development via epigenetic mechanisms, resulting in preterm birth, macrosomia, congenital defects, stillbirth, and neonatal death.
- In India, however, there is minimal research on obesity risk factors throughout pregnancy and the postpartum period.
- Obese pregnant mothers are at an increased risk of developing complications during antenatal, intrapartum, and postnatal periods.
- Several factors, including sociodemographic features, obstetric characteristics, knowledge, and perception of health- promoting behaviour, are linked to the likelihood of maternal obesity.
- Identifying pregnant women at risk of maternal obesity is critical for planning and implementing effective and timely interventions for optimal pregnancy outcomes. Importantly, maternal obesity is widely modifiable as a key pregnancy risk factor.

FIGO's Guidance for the Management of Pregnancy, and Postpartum Obesity

The Pregnancy Obesity and Nutrition Initiative (PONI) developed by FIGO's (The International Federation of Gynecology and Obstetrics) Pregnancy and Non-Communicable Diseases (PNCD) Committee emphasises that management of obesity in pregnancy should be considered in the context of a life course approach (Table 1), linking with preconception, postpartum, and interconception services to prevent excess weight gain before and during pregnancy.

Table 1: FIGO Committee guideline for the management of pre-pregnancy, pregnancy, and postpartum obesity

Time Point A: Pre-Pregnancy

A.1 All women should have their weight and height measured and their body mass index (BMI, calculated as weight in kilograms divided by height in meters squared) calculated. Consider ethnic differences.

A.2 All women with a BMI of >=30 should be advised of the effect of obesity on fertility, the immediate risks of obesity during pregnancy and childbirth, and the subsequent long-term health effect of obesity including the higher risk of noncommunicable diseases for them and their children.

A.3 All women with obesity should be encouraged to lose weight through diet and adopting a healthy lifestyle including moderate physical activity. If indicated and available, other weight management interventions might be considered, including bariatric surgery.

A.4 All women with obesity should be advised to take at least 0.4 mg (400 µg) and consider up to 5 mg folic acid supplementation daily for at least 1-3 months before conception.

Time Point B: Pregnancy

B.1 All women should have their weight and height measured and their BMI calculated at the first antenatal visit. Consider ethnic differences. Advise on appropriate gestational weight gain.

B.2 All women should receive information on diet and lifestyle appropriate to their gestation including nutrient supplements, weight management, and regular physical activity.

B.3 All women with obesity should be advised of the risks of obesity and excess gestational weight gain on pregnancy, childbirth, and long-term health including risk of noncommunicable diseases for them and their children.

B.4 All antenatal healthcare facilities should have well-defined multidisciplinary pathways for the clinical management of pregnant women with obesity including the identification and treatment of pregnancy-related complications.

Time Point C: Postpartum

C.1 All women with pre-pregnancy obesity should receive support on breastfeeding initiation and maintenance.

C.2 All women with obesity and pregnancy complications should receive appropriate postnatal follow-up in line with local resources, care pathways, and in response to the individual health requirements of each woman and her children.

C.3 All women with obesity should be encouraged to lose weight post partum with emphasis on healthy diet, breastfeeding if possible, and regular moderate physical activity. They should be advised of the importance of long-term follow-up as they and their children are at increased risk for non-communicable diseases.

C.4 Maternal obesity should be considered when making the decision regarding the most appropriate form of postnatal contraception.

Way Forward For Policy Implementation

- Intensive system strengthening efforts are needed to improve the coverage and quality of maternal nutrition interventions, particularly calcium supplements and gestational weight gain monitoring.
- Identify approaches for making a nutritionally adequate diet accessible and affordable for pregnant and lactating women households. Promoting the use of local traditional greens and other food items, and popularising Nutri-gardens, which are seen to improve diet diversity.
- Strengthen the knowledge and skills of frontline workers on overweight, obesity as well as its consequences (especially Anganwadi workers, ASHA, ANM, and teachers) through results-focused training, communication materials, and job aids, as well as their support systems, such as supportive supervision.

Key Challenges For The Policy Implementation

- Lack of gestational weight gain charts and corresponding optimal weight gain recommendations for pregnant women;
- Nutrition norms for preventing and managing maternal malnutrition lack penetration in service delivery system;
- Budget for implementation under several heads (capacity building, equipment, supplies, human resource, dissemination, etc) not costed;
- Engagement of private sector for demand creation; targets for maternal obesity missed in the Poshan Abhiyaan;
- Indicators for tracking and review missing from the government's health information management system.

- Harmonise overweight & obesity communication guidelines and critical messages across ministries and programmes. There is a need to initiate a comprehensive and coordinated national nutrition education programme, sensitive to overweight & obesity among women, to increase 'nutrition literacy and promote key nutrition behaviours.
- Promote maternal nutrition in Village Health, Sanitation, and Nutrition Days (VHSND) to deliver these essential nutrition interventions. Increase local involvement in nutrition, particularly in planning, monitoring, and supporting key services and behaviour change efforts, such as through VHSND, home visits by FLWS, and panchayati raj institutions.
- Expand efforts to engage and empower vulnerable communities, particularly women in these communities, to overcome malnutrition (including through Gram Sabhas and self-help groups).
- Promote mild to moderate physical activity during the first 1000 days. Awareness raising efforts improve counselling around these issues, especially during the first 1000 days but also during life course.

SHREE ANNA FOR NUTRITIONAL WELLBEING

By declaring 2023 as 'The International Year of Millets', the United Nations General Assembly has set the tone for promoting millets across the world.

Millets: Key Properties and Benefits

- Millets contain various phytochemicals that exert therapeutic properties owing to their anti-inflammatory and anti-oxidative properties.
- Millet grains are rich sources of nutrients like carbohydrates, protein, dietary fiber, and good- quality fat. They also have substantially higher amounts of minerals like calcium, potassium, magnesium, iron, manganese, zinc, and B complex vitamins, making them a preferable choice over cereal grains.
- Millets can help tackle health challenges such as obesity, diabetes, and lifestyle problems as they are gluten-free and have a low glycemic index.
- A study was undertaken by ICRISAT across four countries, involving nearly 1,000 children, adolescents, and adults, to understand the impact of the inclusion of millets in the diet. The researchers found that millets increased haemoglobin levels by as much as 13.2%.
- They are hardy, resilient crops that have a low carbon and water footprint, can withstand high temperatures, grow on poor soils with little or no external inputs, and are therefore termed 'miracle grains' or 'crops of the future'.
- Millets in India have been given the identity of 'Shree Anna'. As highlighted by the Prime Minister, 'Shree Anna' means a door to prosperity for small farmers of the country; 'Shree Anna' means forebearer of nutrition for crores of people of the country; 'Shree Anna' means welfare of the tribal society of the country; 'Shree Anna' means more crop yield with less water; 'Shree Anna' means chemical- free farming; 'Shree Anna' means a way to tackle the challenge of climate change.

Overview of India's Millet Sector

India is the fifth-largest exporter of millets in the world. Most States in India grow one or more millet crop species. India grows over 17 million tons (MT) of millet, which amounts to 80% of Asia's and 20% of global production. India recorded 27 per cent growth in millet production in 2021-22 over the previous year. Pearl Millet (60%), followed by Sorghum (27%), Finger Millet (11%) and Small Millets (2%) are the major varieties produced in India. The major millet producing States are Rajasthan, Uttar Pradesh, Haryana, Gujarat, Madhya Pradesh, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, and Telangana.

Government Initiatives to Promote Millets

- Under the **National Food Security Mission (NFSM)**, awareness is being created among farmers about millets through demonstrations and training. The growing market for millets will directly benefit the 2.5 crore small farmers who are involved in its production.
- The Union Government is implementing Pradhan Mantri Poshan Shakti Nirman **(PM POSHAN)**, from 2021-22 to 2025-26, wherein millets can be used by States/ UTS.
- The Agricultural and Processed Food Products Export Development Authority (APEDA) has prepared a comprehensive strategy to promote Indian millet exports across the globe commencing December, 2022.
- The Union Budget 2022-23 highlighted that support would be provided for post-harvest value addition, enhancing domestic consumption, and branding millet products nationally and internationally.

India is poised to become a global millet hub if all States and UTs maximize their participation. Some of the key initiatives that States/UTS can implement for the promotion of millets in the daily diet include:

a) Awareness programmes on the health benefits of various millet grains.

b) Millet melas and events to publicise the inclusion of millets in the daily food habits of farmers and consumers at the State-/District- level.

c) Training and promotional campaigns on millet cultivation for farmers and Farmer Producer Organisations, at the district, gram panchayat, and block levels.

d) Chaupals for millet related awareness sessions at the gram panchayat level.

e) Awareness about improved millet production, seed production, and technologies with mechanisation, identification of village clusters for promotion of millets.

f) Distribution of seed mini kits to farmers.

g) Orientation of farmers on new age practices for branding, labeling, packaging, and export markets,

h) Promotion of millets cultivation across fallow and degraded lands.

i) Supplementation of millets in Integrated Child Development Services, Mid-Day Meal, Public Distribution System. and other State funded programmes. 'Shree Anna' has been included by several States in their Public Distribution System. This can be replicated in other States too.

j) Engaging hotel associations for popularising millet recipes and enabling value addition.

COMBATING MALNUTRITION : ACHIEVING PROSPERITY

Malnutrition is a pressing issue, with significant economic consequences that affect the country's growth and development. India has one of the world's fastest expanding economies, but the country is still fighting with malnutrition, especially among children and women. India ranks 101 out of 116 nations on the Global Hunger Index 2021, demonstrating the severity of the issue.

Cost of Malnutrition

1. **Human Capital Loss**: Malnutrition has a severe impact on human capital development. Children who suffer from malnutrition experience stunted growth and cognitive impairments, leading to reduced learning abilities and lower productivity in adulthood.
2. **Increased Healthcare Expenditure**: Malnutrition contributes to a higher burden of disease and Increased healthcare costs. Malnourished individuals are more susceptible to infections, chronic illnesses, and other health complications.
3. **Education and Skill Development**: Malnutrition affects cognitive development, leading to poor educational outcomes. Malnourished children often face difficulties in concentrating, retaining Information, and performing well academically.

4. **Impact on Agricultural Productivity**: Malnutrition is closely linked to agricultural productivity, as undernourished farmers face challenges in sustaining agricultural activities effectively. Lack of proper nutrition hampers physical strength, endurance, and productivity among farmers, affecting crop yields and agricultural output.
5. **Long-Term Economic Implications**: A malnourished population faces reduced earning potential, limited employment opportunities, and increased dependency on social welfare programmes. This creates a drag on economic growth and places an additional burden on government resources, diverting funds that could be allocated to other developmental initiatives.

Addressing The Challenge

Addressing malnutrition in India requires comprehensive and multi-sectoral approach. Some key strategies include:

1. **Strengthening Health Systems**: One of the key strategies to address malnutrition is further strengthening the health systems to ensure accessible and quality healthcare services, especially for vulnerable populations. This involves several aspects:
   a) **Improving Healthcare Infrastructure**: India's healthcare infrastructure, particularly in rural areas, needs to be further strengthened. There should be healthcare facilities like primary care clinics and community health centres with qualified medical personnel, sufficient medical supplies, and necessary medications.
   b) **Enhancing Nutritional Screening and Assessment**: Incorporating routine nutritional screening and assessment in healthcare settings can help identify individuals at risk of malnutrition and provide timely interventions.
   c) **Strengthening Maternal and Child Healthcare**: To combat hunger, more focus on maternal and child healthcare is essential. Promoting antenatal care, healthy eating throughout pregnancy and exclusive breastfeeding through the implementation of programmes can help to enhance mother and infant health outcomes.
   d) **Capacity Building and Training**: It is critical to invest in the education and development of healthcare personnel, especially at the primary care level. This entails improving their expertise in nutrition assessment, counseling, and malnutrition case treatment.
   e) **Integration of Nutrition Services**: Integrating nutrition services within the healthcare system can facilitate a comprehensive approach to addressing malnutrition. This involves incorporating nutrition assessment, counseling, and interventions as part of routine healthcare visits.

2. **Improved Nutrition Interventions**: These interventions should focus on improving dietary diversity, addressing specific nutrient deficiencies, and promoting optimal feeding practices. Here are some key aspects of improved nutrition interventions:
   a) **Food Fortification**: Adding vital micronutrients like iron, vitamin A, iodine, and zinc to frequently consumed food items is known as food fortification. Foods that are commonly consumed, such as salt, wheat flour, rice, and edible oils, can be fortified to help fight widespread nutrient shortages.
   b) **Promotion of Breastfeeding**: Infants receive the best nourishment from breastfeeding, which supports their healthy growth and development. The risk of infant malnutrition can be considerably decreased by programmes that encourage exclusive breastfeeding for the first six months, continuing nursing, and adequate complementary feeding.
   c) **Micronutrient Supplementation**: Prenatal iron and folic acid supplementation can reduce maternal anaemia and enhance the quality of births. Zinc supplementation can boost children's growth and immune response, while vitamin A supplementation can lower the incidence of childhood blindness and improve immune function.
   d) **Nutrition Education and Behaviour Change**: This can be accomplished by promoting the importance of eating a variety of nutrient-dense foods through awareness campaigns, community workshops, and

educational resources. Furthermore, nutrition instruction in schools can aid in establishing healthy eating habits at a young age.

e) **Public-Private Partnerships**: The public and commercial sectors working together can significantly enhance nutrition efforts. It can improve consumer choices and increase the availability and affordability of nutrient- dense meals by encouraging food producers, retailers, and the hospitality sector to offer healthier food options, promote nutrient- rich products, and adopt ethical marketing practices.

3. **Enhancing Agricultural Practices**: Improving agricultural productivity and encouraging environmentally friendly farming methods can help to boost the availability and accessibility of nutritious food. Here are some essential areas to concentrate on in order to improve agricultural practices:
   a) **Diversification of Crops**: Promoting crop diversity can enhance dietary diversity and treat vitamin shortages. The cultivation of nutrient-rich foods such as fruits, vegetables, legumes, and millets can improve micronutrient availability.
   b) **Sustainable Farming Techniques**: These practices reduce the need for synthetic fertilisers and pesticides, while also improving soil health and biodiversity. Organic farming, agro-ecology, and conservation agriculture are all examples of sustainable farming practices.
   c) **Irrigation and Water Management**: Investing in irrigation infrastructure, such as drip irrigation and sprinkler systems, can assist farmers in optimising their water usage and. increasing agricultural yields. Effective water management practices, such as rainwater harvesting and watershed management, can increase agricultural water availability, particularly in water-stressed areas.
   d) **Support for Smallholder Farmers:** Smallholder farmers account for a sizable share of India's agricultural economy. Smallholder farmers' productivity and income can be increased by providing them with finance, superior seeds, modern farming technologies, and training programmes.
   e) **Research and Development**: Climate-resilient crop varieties, nutrient-rich crop types, and new agricultural approaches that maximise resource utilisation can be developed by research institutions. Collaboration between research institutions, farmers, and extension agencies is critical to ensuring that research findings are effectively disseminated and adopted.

4. **Social Protection Programmes**: These programmes provide support to vulnerable individuals and families, ensuring their access to nutritious food, healthcare services, and other essential resources. Here are key aspects of social protection programmes that can contribute to combating malnutrition:
   a) **Targeted Cash Transfer Programmes**: It can help to alleviate poverty and increase access to nutritious meals. The Public Distribution System (PDS) and the National Food Security Act are direct benefit transfer programmes that aim to supply subsidised food grains to eligible households.
   b) **Maternal and Child Welfare Programmes**: Financial help, nutrition counseling, and healthcare services are provided to pregnant and breastfeeding mothers through programmes, such as the Integrated Child Development Services (ICDS) and the Pradhan Mantri Matru Vandana Yojana (PMMVY), assuring optimal maternal nutrition and infant care.
   c) **School Feeding Programmes**: School feeding programmes, such as the Mid-Day Meal Scheme, are critical in combating both food insecurity and malnutrition among school- aged children. These programmes provide nutritious meals in schools, which improves children's nutritional status, encourages frequent school attendance, and improves their overall learning outcomes.
   d) **Employment Generation and Livelihood Programmes**: Improving livelihood possibilities for vulnerable populations can help to alleviate poverty and improve nutrition outcomes. Programmes such as the Mahatma Gandhi National Rural work Guarantee Act (MGNREGA) provide work opportunities and economic support to rural communities, increasing their purchasing power and access to nutritious food.
   e) **Behaviour Change Communication**: These programmes can reinforce beneficial nutrition practices and improve health outcomes by fostering behaviour change at the individual and community levels. To

educate beneficiaries on the importance of nutrition, health, and hygiene practices, social protection programmes should include behaviour change communication tactics.

f) **Monitoring and Evaluation**: Regular evaluations and surveys can offer information on programme efficacy, highlight gaps, and influence evidence-based policy decisions. To ensure that initiatives are accomplishing their intended aims, monitoring systems should track important variables relating to food security, dietary diversity, child growth, and maternal health.

Conclusion

Malnutrition has significant economic effects, influencing human capital development, healthcare expenditures, educational performance, agricultural production, and long-term economic growth. To combat malnutrition, the Government, civil society, and the commercial sector must work together to invest in nutrition-specific and nutrition-sensitive measures.