Advocacy for Healthy Diets: Nutrition Brief Series

Nutrition Brief 5 of 6 – Nutrition Matters: Diet Diversity

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A general view of a 'Tiranga Thali' during a Godhbharai session at an Anganwadi centre in Nayakheda, Rajasthan, India, © UNICEF/UNI335899/ Bhardwaj

1. From birth to adulthood, how does nutrition impact lifelong health?

Nutrition during the earliest stages of life - particularly during the First 1,000 Days[1] - is critical for a child's physical, cognitive, and immune development. Better nutrition is related to improved infant, child and maternal health, stronger immune systems, safer pregnancy and childbirth, lower risk of non-communicable diseases (such as diabetes and cardiovascular disease), and longevity[2]. People with adequate nutrition learn better, are more productive and can create opportunities to gradually break the cycles of poverty and hunger[1].

Malnutrition, in every form, presents significant threats to human health. Today the world faces a triple burden of malnutrition that includes undernutrition (stunting, underweight and wasting), micronutrient deficiencies (also called the "hidden hunger") as well as overnutrition (overweight and obesity). Varied forms of malnutrition pose serious and lasting developmental, economic, social, and medical impacts for individuals and their families, for communities and for countries[1].

[1] The First 1,000 Days: From the conception of the child to the age of two years
[2] WHO: Nutrition

On the other hand, a higher intake of healthy, whole foods supports memory, verbal retention, and cognitive functioning throughout life[3]. This positive effect holds true across different socioeconomic backgrounds, proving that good food choices are universally beneficial[4].

However, increased production of processed and ultra-processed foods, rapid urbanization and changing lifestyles have led to a shift in dietary patterns. People are now consuming more foods too high in energy, fats, free sugars and/or salt/sodium, and many people do not eat enough fruits, vegetables and other dietary fibre such as whole grains[5]. This has led to increased levels of malnutrition, which manifests itself in different ways, in different contexts. Largely though, energy rich diets that are low in variety (of foods) is associated with chronic nutritional deficiencies, and has negative consequences for health, immunity, mental health and reproductive and social capacities[6].

Thus, eating a balanced diet is crucial to fulfil all the nutritional needs of the body. There is no single food which can provide all necessary nutrients and hence, these need to be obtained through a judicious choice of a variety of foods[7] – also called a diverse diet. The exact make-up of a diversified, balanced and healthy diet will vary depending on individual characteristics (e.g. age, gender, lifestyle and degree of physical activity), cultural context, locally available foods and dietary customs. However, the basic principles of what constitutes a healthy and diverse diet remain the same[8].

2. What is diet diversity and why is it important?

Dietary diversity refers to the number of different food groups consumed over a given reference period. It is widely used as a proxy indicator for the quality of diets and the adequacy of micronutrient intake at both individual and household levels. As defined by the Food and Agriculture Organisation (FAO), **dietary diversity is a qualitative measure of food consumption that reflects access to a variety of foods and serves as an indirect indicator of nutrient sufficiency**[9]. In other words, dietary diversity is the sum of well identified food groups consumed during a certain period of time[10]. Importantly, no single food item - except breastmilk in the first six months of life - can provide all the essential nutrients the body needs.

Therefore, varied or diverse diets are required to meet physiological demands across the life cycle. This makes dietary diversity a fundamental principle in food-based dietary guidelines globally and a cornerstone of strategies to improve nutrition, prevent disease, and build resilient food systems[11].

Dietary diversity is conventionally measured through tools such as the *Household Dietary Diversity Score* (HDDS) and the *Individual Dietary Diversity Score* (IDDS). These are used to assess, respectively, the economic ability of households to access a variety of foods, and the nutrient adequacy of individual diets.

[3] Puri, S., Shaheen, M., & Grover, B. (2023). Nutrition and cognitive health: A life course approach. Frontiers in public health, 11, 1023907.
[4] WHO: Healthy diet
[5] Dietary Guidelines for Indians, ICMR-NIN, 2024.
[6] Gupta, S., Sunder, N., & Pingali, P. L. (2020). Market access, production diversity, and diet diversity: evidence from India. Food and nutrition bulletin, 41(2), 167-185.
[7] Dietary Guidelines for Indians, ICMR-NIN, 2024.
[8] WHO: Healthy diet
[9] FAO. Guidelines for measuring household and individual dietary diversity. Rome: FAO, 2010.
[10] Rajpal, S., Kumar, A., Alambusha, R., Sharma, S., & Joe, W. (2021). Maternal dietary diversity during lactation and associated factors in Palghar district, Maharashtra, India. Plos one, 16(12), e0261700.
[11] FAO & WHO. Sustainable healthy diets – Guiding principles. Rome: FAO, 2019.

Among women of reproductive age, the *Minimum Dietary Diversity for Women* (MDD-W) is a widely used indicator that reflects the likelihood of meeting micronutrient requirements. It considers whether a woman has consumed at least five out of ten defined food groups in the past 24 hours[12].

A similar indicator, the *Minimum Dietary Diversity for Children* (MDD-C), is used to assess the diets of children aged 6 to 23 months, based on consumption of five or more out of eight food groups, including breastmilk[13].

In 2024, the ICMR–NIN released the updated *Dietary Guidelines for Indians*[14], which outline 10 food groups and recommend that a healthy/ diverse plate should include 5 to 7 of them (Illustration 1).

Illustration 1: My plate for the day for 2,000 Kcal, Dietary Guidelines for Indians, ICMR-NIN, 2024



It is important to note that various methods and classifications of food groups exist with similarities and distinctions. Table 1 articulates FAO's food groups for women and children, along with the 10 defined food groups as per ICMR-NIN's guidelines for Indians.

[12] FAO & FHI 360. Minimum Dietary Diversity for Women – A Guide to Measurement. Rome: FAO, 2016.
[13] UNICEF & WHO. Indicators for assessing infant and young child feeding practices: Definitions and measurement methods. Geneva: WHO/UNICEF, 2021.
[14] IICMR-National Institute of Nutrition. *Dietary Guidelines for Indians*. Hyderabad, Telangana, India. May 2024.

Table 1: Food group categories defined by FAO and ICMR-NIN

List of the 8 food groups used to measure Minimum Dietary Diversity for Children[13]		List of the 10 food groups used to measure Minimum Dietary Diversity for Women[12]		List of the 10 food groups defined by ICMR-NIN to compose a healthy/ diverse plate[14]	
1	Breast milk	1	Grains, white roots and tubers, and plantains	1	Cereals and millets
2	Grains, roots, tubers and plantains	2	Pulses (beans, peas and lentils)	2	Pulses
3	Pulses (beans, peas, lentils), nuts and seeds	3	Nuts and seeds	3	Vegetables
4	Dairy products (milk, infant formula, yogurt, cheese)	4	Dairy	4	Nuts, oil seeds, oils and fats
5	Flesh foods (meat, fish, poultry, organ meats)	5	Meat, poultry and fish	5	Green leafy vegetables
6	Eggs	6	Eggs	6	Fruits
7	Vitamin A-rich fruits and vegetables	7	Dark green leafy vegetables	7	Dairy
8	Other fruits and vegetables	8	Other vitamin A-rich fruits and vegetables	8	Roots and tubers
		9	Other vegetables	9	Flesh foods
		10	Other fruits	10	Spices and herbs

Scientific evidence consistently shows that higher dietary diversity is associated with improved health outcomes. Prospective studies have linked diverse diets to greater micronutrient intake, lower incidence of child malnutrition (including stunting and wasting), improved cognitive development, and a reduced risk of non-communicable diseases such as type 2 diabetes and cardiovascular disease [6 15 16]. Dietary diversity also contributes to better mental well-being and metabolic regulation, and it plays a critical role in promoting satiety, reducing the overconsumption of energy-dense but nutrient-poor foods[17].

The role of dietary diversity in ensuring food and nutrition security (for individuals, households, and communities) is particularly important in the face of economic, climate-related, or public health shocks. A diverse food basket allows households to absorb fluctuations in the availability or price of any single food group - enhancing dietary resilience[18]. This is especially relevant in low- and middle-income settings, where food supply chains may be vulnerable to seasonal or systemic disruptions. However, it is important to note that households and individuals vary in their consumption habits depending on various characteristics such as lifestyles, demographics, preferences, etc. Understanding these differences in their consumption behaviour is critical for designing informed interventions[19].

Promoting dietary diversity also supports and sustains culturally appropriate and context-sensitive food choices. In many traditional food systems, local preparation methods and food pairings enhance nutrient bioavailability. For example, fermenting cereals or soaking pulses can reduce anti-

[15] UNICEF Office of Research – Innocenti. Food and Nutrition in the First 1,000 Days. Florence: UNICEF, 2020.
[16] Arimond, M., & Ruel, M.T. (2004). Dietary Diversity Is Associated with Child Nutritional Status: Evidence from 11 Demographic and Health Surveys. J. Nutr. 134: 2579–2585.
[17] Adan, R.A.H. et al. (2019). Nutritional psychiatry: Towards improving mental health by what you eat. Eur Neuropsychopharmacol, 29(12), 1321-1332.
[18] HLPE. Food security and nutrition: Building a global narrative toward 2030. Rome: CFS, 2020.
[19] Venkatesh, P., Premlata, S., Lenin, V., Sudipta, P., Mahra, G. S., Sukanya, B., ... & Monika, Y. (2019). Dietary diversity: determinants and its relationship with nutritional outcomes in Uttar Pradesh. Indian Journal of Agricultural Economics, 74(3), 444-460.

nutritional factors and improve the absorption of iron and zinc. Similarly, combining iron-rich plant foods with vitamin C-rich fruits can increase iron uptake. These practices, often rooted in indigenous knowledge, represent sustainable and non-invasive strategies to improve diet quality[20].

A diverse diet naturally supports the intake of multiple micronutrients, reducing the risk of deficiencies without the complications that may arise from relying solely on single-nutrient supplements or fortified foods[21]. Food-based approaches are often more sustainable and acceptable at the household level, as they build on familiar ingredients, cooking methods, and cultural preferences[22]. Yet despite these advantages, achieving adequate dietary diversity remains a major challenge - particularly for women and children in low-resource settings.

Despite widespread recognition of its importance, dietary diversity remains low in many parts of the world - including India. Data from the National Family Health Survey (NFHS-5) indicates that **only 11 percent of children aged 6-23 months receive a minimum acceptable diet** that includes both dietary diversity and meal frequency[23]. Among women of reproductive age, especially those in rural, tribal, or lower-income groups, the proportion meeting the MDD-W threshold remains low. In India, **only 41 percent of women aged 15–49 achieved the minimum dietary diversity** standard[24] in 2021, indicating a considerable risk of micronutrient inadequacy[25]. These gaps point to deep structural and behavioural barriers that limit the consumption of diverse, nutrient-rich foods.

3. The Challenge: Drivers of Dietary Diversity

Access to diverse diets is shaped by interconnected factors that span structural, economic, social, and environmental domains. In India, inadequate dietary diversity persists despite increased food production and economic growth, due to limited availability, high costs, consumer preferences, and unsupportive food environments. Layered on these are cross-cutting factors - such as gender dynamics, care burden, and seasonal variability - that further constrain access, particularly for women and marginalized groups.

Availability: India has made steady and commendable progress in food production over the past two decades, with encouraging trends in the output of nutrient-rich foods. Between 2013-14 and 2023-24, milk production rose from 137.7 to 239.3 million tons, egg production increased from 78.5 to 142.8 billion, fish production nearly doubled from 9.6 to 18.4 million tons, and meat production expanded from 6.7 to 10.25 million tons[26]. Pulses production also improved significantly, from 19.25 to 24.5 million tons[27]. India continues to hold its position as the world's second-largest producer of fruits and vegetables[28] - an important marker of its agricultural potential.

These gains, while substantial, have not been evenly matched by diversification across all farm systems. Staple grains, particularly rice and wheat, continue to dominate the production landscape, supported by longstanding policy incentives such as input subsidies, price guarantees, and public

[20] FAO. Indigenous Peoples' Food Systems: Insights on sustainability and resilience. Rome: FAO, 2021.
[21] Chaudhary, V., Saraswathy, K. N., & Sarwal, R. (2022). Dietary diversity as a sustainable approach towards micronutrient deficiencies in India. Indian Journal of Medical Research, 156(1), 31-45.
[22] Roy, S., Ratho, R. K., Dubey, A., Ghosh, S., & Sinha, B. (2024). Community perceptions of food-based supplementation for TB-affected households in Jharkhand, India: A qualitative study from the RATIONS trial. PLOS Global Public Health, 4(5), e0004219.
[23] International Institute for Population Sciences (IIPS) & MoHFW. National Family Health Survey – 5 (2019–21). Mumbai: IIPS, 2021.
[24] Minimum dietary diversity standard for women = Consuming ≥5 of the 10 defined food groups in the previous 24 hours
[25] Global Diet Quality Project. "Diet Quality Profile: India" (2021)
[26] Press Information Bureau. (2024a). Year-End Review – Department of Animal Husbandry & Dairying. https://pib.gov.in
[27] Press Information Bureau. (2024b). Pulses Production – Ministry of Agriculture and Farmers Welfare.
[28] Press Information Bureau. (2023). India ranks second globally in fruit and vegetable production.

procurement[29]. As a result, only 7 percent of farmers grow fruits and vegetables, and just 53 percent report income from animal husbandry[30]. Limited crop diversification - especially at the smallholder level - constrains the year-round availability of perishable, nutrient-dense foods in many regions, and keeps their prices relatively high. Enhancing the availability of diverse foods will require complementary investments in production systems, value chains, and market access that prioritize both nutrition and livelihood resilience.

Affordability: Cost is a major determinant of dietary choices. As of 2021, over 56 percent of India's population could not afford a healthy diet, defined as one that meets the minimum requirements for dietary energy, essential nutrients, and food-based dietary guidelines[31]. This affordability gap stems from both low incomes and the high cost of nutrient-dense foods. For example, leafy vegetables cost 8-22 times more per calorie than staples like rice or wheat, and more than double the cost of processed snacks[32]. Moreover, the cost of a recommended healthy diet is rising faster than that of typical food baskets[33]. Animal-source foods, fruits, and vegetables account for nearly two-thirds of the total cost of a healthy diet[34]. As prices climb, low-income households are forced to prioritize energy-dense, nutrient-poor foods - further entrenching cycles of poor nutrition and disease.

Consumer Preferences: Economic access alone does not guarantee better nutrition. In India's wealthiest households, vegetable consumption still falls below recommended levels, while expenditure on ultra-processed foods continues to grow[35]. This indicates that rising incomes may not lead to healthier food choices in the absence of improved awareness and behavioural change. Cultural preferences, dietary traditions, and widespread misinformation often influence food choices more strongly than affordability. For instance, a study in rural Bihar found that a majority of respondents believed biscuits were nutritious, and 43 percent considered fried foods to be healthy[36]. Such misconceptions are compounded by family norms, limited nutrition education, and entrenched taste preferences, especially among children, adolescents, and women who often have limited decision-making agency over food consumption at home[37] [38].

Food Environments: Food environment refers to the physical, economic, political and socio-cultural contexts in which consumers engage with the food system to make decisions about acquiring, preparing and consuming food[39]. When we look at a food environment, we see that diets are far from being a matter of simple personal preference[40]. Rapid urbanization, rural transformation, and digital connectivity are reshaping India's food landscape. Supermarkets, online platforms, and informal vendors are increasingly stocked with ultra-processed foods, often marketed aggressively and priced competitively[41].

[29] Pingali, P., Aiyar, A., Abraham, M., & Rahman, A. (2017). Transforming Food Systems for a Rising India. Palgrave Macmillan.
[30] Chand, R., & Singh, A. (2024). Shifting Trends in Agricultural Diversification in India. NITI Aayog Working Paper.
[31] FAO, IFAD, UNICEF, WFP & WHO. (2024). The State of Food Security and Nutrition in the World.
[32] Headey, D., & Alderman, H. (2019). The relative caloric prices of healthy and unhealthy foods in 176 countries. Global Food Security, 23, 100–138.
[33] Narayanan, S., et al. (2024). Price Trends and the Cost of Healthy Diets in India. CSE Working Paper.
[34] Raghunathan, K., et al. (2021). Affordability of recommended diets in rural India. IFPRI Discussion Paper 2057.
[35] Sharma, R., et al. (2020). Changing Food Consumption Patterns in Urban India. NCAER.
[36] Samin, A., et al. (2023). Food and Nutrition Beliefs in Bihar: A Behavioural Study. Bill & Melinda Gates Foundation / IFPRI.
[37] Jasvir Kaur et al. (2020). Multilevel Influences on Fat, Sugar, Salt, Fruit, and Vegetable Consumption Behaviors Among Urban Indians: Application of the Social Ecological Model.
[38] Das & Mishra (2021). Dietary Practices and Gender Dynamics: Understanding the Role of Women. Journal of Ethnic Foods.
[39] High Level Panel of Experts on Food Security and Nutrition (HLPE). (2017). Nutrition and food systems. Report No. 12, Committee on World Food Security. Rome: FAO.
[40] UNICEF. (2024). Why our food environments matter. UNICEF India.
[41] Blake, L., et al. (2025). Digital Retail and Food Environments in India. Tata-Cornell Institute.

These food environments disproportionately influence low-income families and young consumers, who are especially susceptible to targeted advertising and convenience-based purchasing. In fact, the growing dominance of packaged and processed foods often displaces healthier options, even when they are locally available[42].

Cross-Cutting Barriers:

- ✓ **Gender Norms, Care Work and Time Poverty:** Women in India shoulder the majority of unpaid domestic and care responsibilities (cooking, childcare, farm work, etc.) which leave little time for planning and preparing diverse meals. A national time-use survey (2019) highlighted that social norms, rather than socioeconomic factors, primarily explain this burden[43]. Likewise, women's limited decision-making power in household finance and agricultural choices reduces their ability to purchase or produce nutrient-dense foods - and often prioritizes men's dietary needs over their own[44]. Empirical evidence confirms the causal pathway: in rural India, women who control income or decisions over farming and food procurement are significantly more likely to procure pulses, dairy, eggs, fish, and meat - enhancing household diet quality[45]. However, this remains rare: only a minority of farm households enable women's agency in food-related decisions.
- ✓ **Seasonality and Agricultural Cycles:** Seasonal variability continues to challenge dietary diversity in rural and tribal regions of India. During the monsoon lean season, heat stress and water scarcity reduce the reach and functionality of markets—resulting in fewer vendors and limited availability of diverse foods. At the same time, access to local markets is constrained by poor or non-existent transportation infrastructure and low purchasing power, further exacerbating food insecurity. In winter, while certain crops like tubers and citrus fruits become more abundant, overall access to nutrient-rich foods remains limited. This is often due to inadequate storage facilities, reduced market reach and accessibility, and persistent gaps in the supply chain connecting producers, transporters, retailers, and consumers[46] [47]. Overall, it reduces the availability and affordability of fresh vegetables and leafy greens. A longitudinal study in forested districts of Jharkhand and West Bengal provides compelling evidence of these seasonal effects. Women who consumed wild-harvested foods - including leafy greens, root tubers, and forest fruits - recorded 9 and 13 percent higher mean Dietary Diversity Scores in June and July, respectively, compared to those who did not consume wild foods[48]. This underscores the vital role of wild foods as nutritional buffers during agricultural off-seasons. However, the identification and documentation of such locally available, low-cost wild foods and their nutritional values remain insufficient in India. This information gap limits the promotion of diversified diets that are accessible and affordable in targeted areas, while higher-cost alternatives with similar nutritional benefits are promoted, often creating aspirational but unachievable dietary goals for many households.

Besides the factors mentioned above, dietary diversity also depends on foundational systems - such as education, infrastructure, and public service delivery. Nutrition literacy remains

[42] UNICEF. (2024). Why our food environments matter. UNICEF India.
[43] Ministry of Statistics and Programme Implementation (MoSPI). (2020). Time Use in India 2019: A Report. Government of India.
[44] FAO. (2023). The status of women in agrifood systems. Rome: Food and Agriculture Organization of the United Nations.
[45] Pingali, P. et al. (2017). Transforming Food Systems for a Rising India.
[46] FAO, IFAD, UNICEF, WFP and WHO. (2020). The State of Food Security and Nutrition in the World 2020: Transforming food systems for affordable healthy diets. Rome: FAO.
[47] National Institute of Nutrition (NIN). (2021). Diet and Nutritional Status of Rural Population: Report of Third Repeat Survey. Hyderabad: ICMR-NIN.
[48] Indian School of Business et al. (2023). Wild foods contribute to women's higher dietary diversity in India. Nature Food.

limited, especially among women and adolescent girls, which constrains knowledge of diverse food groups and dietary needs. Similarly, physical infrastructure - including irrigation, cold storage, and rural transport- shapes the production, pricing, and availability of diverse, perishable foods, particularly in remote areas[49]. Strengthening these systems, especially through locally contextualized nutrition education, is essential to improve access to diverse, healthy diets. When individuals and communities have clarity about what constitutes a balanced diet, it enhances the impact of information campaigns, social behaviour change efforts, and public programmes.

4. Dietary Diversity in Practise: A Rainbow Diet

The Rainbow Diet is a practical and visually intuitive way to promote dietary diversity. By including foods of different colours each day, individuals can increase their intake of a broad spectrum of vitamins, minerals, antioxidants, and phytochemicals that collectively support health, immunity, and disease prevention[50]. As a practice, eating healthy foods of all the colours of the rainbow in every meal, not simply for the aesthetic, but for the health benefits that each of these coloured foods carries. According to scientific research[51] [52], these are the properties of the colours of different foods:

- Red foods and inflammation: High in antioxidants (e.g. anthocyanin) and red-food carotenoids (e.g. astaxanthin, lycopene), naturally red foods like tomato, red pepper, red cabbage, berries, pomegranate, watermelon, and strawberry support cardiovascular health, have anti-inflammatory properties, and help modulate the immune system (e.g. through vitamin C).
- Orange foods and reproductive health: Rich in carotenoids, naturally orange pigmented foods like pumpkin, carrot, orange, and mango support endocrine function and fertility by aiding processes like ovulation.
- Yellow foods and digestion: Provide dietary fibre that supports a healthy gut microbiome and promotes digestion through gastric motility and secretions. Examples include lemon, corn, pineapple, papaya, etc.
- Green foods and cardiovascular health: Contain nutrients like vitamin K, folate, magnesium, and potassium that support heart health and metabolic function. Commonly consumed examples include spinach, broccoli, fenugreek, amaranth leaves, etc.
- Blue-purple foods and cognition: Polyphenol-rich foods like brinjal, black grapes, plum, and jamun aid memory, mood, and learning - due to compounds like flavonoids, flavanols (e.g. kaempferol, quercetin), and phenolic acids.

The Rainbow Diet concept is not just about colourful eating - it encourages a variety of locally available foods across seasons and food groups, cooked at home, aligning closely with both scientific guidance and traditional food practices. It serves as an accessible entry point for nutrition education,

[49] Pingali, P., Aiyar, A., Abraham, M., & Rahman, A. (2019). Transforming Food Systems for a Rising India. Palgrave Macmillan.
[50] Warne, T., Ahmed, S., Stewart, A., & Dupuis, V. (2021). Dietary Diversity (Sustainable Diet Series). Salish Kootenai College/Food & Health Lab, Montana State University.
[51] Minich DM. A Review of the Science of Colorful, Plant-Based Food and Practical Strategies for "Eating the Rainbow". J Nutr Metab. 2019 | A Review of the Science of Colorful, Plant-Based Food and Practical Strategies for "Eating the Rainbow" - PubMed
[52] Luke Coutinho, "How to Eat a Rainbow Diet," Luke Coutinho Official Blog | How To Eat A Rainbow? Here's A FREE 101 Guide!

especially for children, adolescents, and caregivers who may be unfamiliar with technical terms like micronutrient adequacy or dietary diversity[53].

The benefits extend beyond everyday nutrition. During illness and recovery, the body's micronutrient reserves are rapidly depleted. A diverse diet - rich in vegetables, fruits, pulses, and nuts - helps replenish key nutrients and supports immune resilience. Many Indian household staples like garlic, turmeric, and ginger also offer antimicrobial and anti-inflammatory benefits, blurring the line between food and medicine[54].

In addition, the aesthetic and sensory aspects of colourful meals - visual appeal, variety of textures, cultural familiarity - can positively influence appetite, mood, and emotional well-being[55]. This is particularly relevant for young children, pregnant women, and older adults, whose dietary intake may be shaped by taste fatigue, food taboos, or changes in mental health.

While specific nutritional needs evolve across the life course, the importance and principles of dietary diversity remain constant. In early childhood, a variety of foods supports physical growth and immune development. As children transition into adolescence, the need for nutrient-rich diets becomes even more critical due to rapid growth and the onset of puberty - especially for girls, whose nutrition affects their long-term health and that of future babies (if they choose to have any). In adulthood, particularly during pregnancy and lactation, a diverse diet helps meet elevated energy and micronutrient demands, supports foetal development, and promotes maternal well-being. Older adults also benefit from diverse diets that protect against age-related decline, support immunity, and preserve muscle mass.

Across all stages, the principle is clear: no single food can provide all essential nutrients. Promoting diet diversity - especially through locally available, seasonal foods - is thus, key to sustaining health and resilience throughout life.

5. Strategic Recommendations to Promote Dietary Diversity

To translate awareness into action, stakeholders across levels - households, institutions, and systems - must play a coordinated role in promoting diverse, balanced diets. Below are tailored recommendations offering **key actions for key actors.**

Consumers and Communities

- *Eat the Rainbow*: Incorporate a variety of naturally coloured foods daily—each colour offers distinct nutrients and phytochemicals that support immunity, heart health, and cognitive function.
- *Try New Recipes:* Experiment with local, seasonal ingredients. Feature nutrient-dense foods such as leafy greens, pulses, fruits, millets, and eggs.
- *Revive Traditional Diets*: Reclaim and revive local food - many traditional diets already emphasize diversity through mixed cereals, fermented foods, and foraged greens.
- *Engage Men and Boys*: Promote shared responsibility in food planning and preparation to ease women's time burden and reinforce inclusive food decisions.

[53] UNICEF. (2021). Programming Guidance: Infant and Young Child Feeding.
[54] Ministry of AYUSH & Ministry of Health and Family Welfare (2020). Immunity Boosting Traditional Remedies. Government of India.
[55] FAO & WHO. (2019). Guiding Principles for Sustainable Healthy Diets. Rome.

Institutions and Frontline Programmes

- *Offer a Variety of Nutrient-Dense Foods*: In schools, Anganwadis, canteens, and hostels, integrate diverse foods using culturally appropriate recipes (as a complement to the Take Home Ration and the Hot Cooked Meal government's programme)[56].
- *Procure Locally and Seasonally*: Source from smallholders and women's collectives, with a focus on coarse grains, pulses, vegetables, and wild edibles.
- *Use Visual Tools*: Promote the Rainbow Diet and seasonal food charts in community spaces, health camps, and school walls.
- *Conduct Demonstrations*: Use community-based events, food fairs, recipe contests, and cooking demonstrations to showcase affordable ways to cook diverse meals.
- *Integrate Nutrition Messaging*: Embed dietary diversity education into adolescent and maternal health sessions, growth monitoring, and farmer outreach.

Policymakers and Programme Designers

- *Incentivize Crop Diversification*: Reform Minimum Support Price, input subsidies, and procurement norms to support pulses, millets, fruits, and vegetables - not just rice and wheat.
- *Adapted Agricultural Techniques:* Crop diversification & intercropping (promote millets, pulses, oilseeds, fruits, vegetables alongside cereals); Integrated & homestead farming (combine crops, livestock, poultry, aquaculture, and nutrition gardens for multiple food groups); Climate-smart practices (drought/flood-tolerant and short-duration crops for year-round diversity); Biofortified & indigenous crops (scale-up nutrient-rich varieties such as iron millet, zinc rice, vitamin A maize, moringa, amaranth, etc.); Water, soil & post-harvest management (micro-irrigation, organic soil practices, and local processing to boost availability).
- *Strengthen Nutrition Education*: Include practical ways to achieve dietary diversity in school curricula and frontline worker trainings using age-appropriate, region-specific visual content. Building the capacity of Self-Help Groups (SHGs) in the promotion of diversified food could assist in reaching an increased number of families and communities.
- *Leverage Community-based Platforms:* Identify and engage underutilised platforms - such as self-help groups (SHGs), youth collectives, and religious or cultural associations - to amplify their role in supporting nutrition campaigns, services, and related initiatives.
- *Support Infrastructure for Perishables*: Invest in cold chains, rural storage, processing units, and transport to stabilize year-round supply of nutrient-dense foods.
- *Safeguard Forest and Common Lands*: Protect community access to wild foods and traditional commons that serve as critical nutrient sources in tribal belts.
- *Monitor Diet Quality*: Establish robust systems to track dietary diversity and food quality at the local, district, state, and national levels. This includes integrating diet quality indicators into existing surveys (e.g. NFHS) and supporting decentralized data collection efforts to inform context-specific nutrition interventions.

[56] Government programs such as Take Home Ration and Hot Cooked Meals are not designed to provide complete nutritional intake. It is important that parents and Anganwadi workers are aware of their role in actively complementing these provisions with additional foods, within their financial means.

5. Ways Forward

India has made strong strides in improving food and nutrition security, with a growing portfolio of programmes addressing hunger, malnutrition, and access to subsidized food. The next step is to intentionally integrate dietary diversity into the objectives and delivery of these efforts - aligning policies, systems, and communities around the shared goal of enabling all individuals to access and consume a variety of nutrient-rich foods.

A key opportunity lies in translating dietary diversity into clear, actionable guidance for families and frontline workers. Concepts like the Rainbow Diet - rooted in both science and tradition - can help simplify complex nutrition messages. When delivered through trusted platforms like Anganwadi centres, schools, and self-help groups, they can build food literacy, shift dietary preferences, and make healthy diets aspirational.

At the systems level, stronger inter-sectoral and inter-ministerial coordination is needed. Dietary diversity is shaped by agriculture, markets, health services, and social protection. Creating space for decentralized menu planning, local procurement, and integrated food initiatives can help align these efforts with nutrition goals. Several states are already demonstrating success through locally adapted solutions, offering valuable models for wider adaptation[57] [58] [59] [60]. These innovations demonstrate the importance of contextual, community-driven approaches. The next step is to ensure that such innovations are not just documented but actively learned from and scaled where relevant. This calls for knowledge-sharing platforms, flexible funding windows, and cross-state collaboration that allows for iterative learning. Interestingly, an econometric analysis[61] estimates that in a counterfactual scenario of full "convergence" - where all relevant interventions across sectors are simultaneously and successfully implemented - child stunting could be reduced by 18.37 percentage points and underweight by 20.26 percentage points. These findings underscore the transformative potential of coordinated, multisectoral action in improving nutritional outcomes[62].

As India moves toward integrating dietary quality into national nutrition goals, building a robust evidence base will be key. While some metrics like MDD are already in use, there is growing consensus that a more nuanced understanding of diet patterns, cost dynamics, and intra-household consumption is needed to inform policy. Developing such insights will require collaboration between researchers, programme implementers, and government institutions - strengthening the loop between data generation and action. Better data systems will also be essential. Including indicators like intra-household consumption patterns, food literacy, and cost of healthy diets in national and subnational surveys can help track progress and guide action. More granular, timely data will support equity-focused decision-making and ensure dietary diversity becomes a visible and measurable part of nutrition planning.

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Promoting dietary diversity also intersects with broader goals of equity, sustainability, and resilience. Ensuring that these efforts are inclusive - especially of tribal, rural, and other nutritionally vulnerable populations - will enhance their impact. Doing so means engaging communities not just as beneficiaries, but as partners in shaping food systems that reflect their needs, preferences, and knowledge.

By leveraging existing strengths and remaining open to innovation, India is well-positioned to lead a shift toward nutrition-responsive systems that prioritize not just calories, but the quality and diversity of diets. The path forward lies in making dietary diversity not just a message - but a measurable, resourced, and community-owned commitment.