

Curbing Nutritional Attrition to Achieve Nutritional Security through Agri-Nutri-Food Value Chain

September 2022



The Associated Chambers of Commerce and Industry of India

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Curbing Nutritional Attrition to Achieve Nutritional Security through Agri-Nutri-Food Value Chain

September 2022

The Associated Chambers of Commerce and Industry of India

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Deepak Sood
Secretary General
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MESSAGE

India is a leader in the surplus production of food crops and further value addition, which has economic significance globally. However, we are still defining and identifying the ways to achieve nutritional security, thereby bringing forth the methods to maintain nutritional value in food. Health and nutrition is a vital component of our lives, ensuring the healthy functioning of organs, supporting the normal ageing process, having immuno-modulatory benefits and maintaining a healthy lifestyle. As sustenance comes from our food while consuming nutritious food, it is essential for maintaining our overall health in terms of both physical and mental and emotional health.

Today, India is promoting Biofortified crops enriched biologically with essential nutrients for optimum well-being. This drive is also supported under the leadership of our Hon'ble Prime Minister to curb nutritional deficiency by fortifying the staples and the processed foods which are usually regularly consumed, such as rice, wheat flour, salt, milk, oil, etc. As an essential aspect of one's life, nutrition is becoming a priority amongst the commonalities. This focus has led to the expansion of nutraceuticals, nutritionally enriched products, healthier alternatives to traditional snacks, etc.

The Government of India has a renewed focus on implementing policies that support addressing the hazards caused by nutritional insufficiency in our country. With the promotion of such policies and their implementation, we must make good choices in adopting what is good for our health and vitality. With such a proactive approach, there is a need for cascading better nutrition practices with an emphasis on the intake of a nutritious diet.

Given the significance of the subject, ASSOCHAM, jointly with Nangia Andersen LLP, has come out with this report, which highlights the multisectoral approach to nutrition for improving the performance of food value chains. The report recommends that the agri-food value chain can be implemented, among others, through public programmes and policies to curb hunger and malnutrition. We acknowledge the efforts made by the experts in preparing the report being presented at the 'National Conference on Achieving Nutritional Security Through Agri-Nutri-Food-Value Chain'. We hope the report will provide helpful information and insights to the policymakers, industry leaders, and stakeholders to strengthen India as a nutritionally secure nation.

Deepak Sood



Suraj Nangia
Partner
Nangia Andersen LLP

MESSAGE

The statistics on nutritional status indicate that India has struggled on the issue, along with the other fast-growing economies of Asia and the World. With a ranking of 101 of 116 on the Global Hunger Index 2021 and 131 of 189 on the Human Development Index 2020, India is home to almost one-fourth of the world's chronically undernourished people (190.7 million out of 815 million). Therefore, SDG 2 – Zero Hunger cannot be achieved globally unless it is achieved in India.

Achieving nutritional security in the context of a growing population, unpredictable climate change effects, diminishing land and water resources, environmental degradation, and fast changing diets will require not just approaches to sustainably producing more food, but also dealing with food waste and promoting improved nutritional outcomes.

Capacities for nutrition-sensitive value chains can be developed through resources and interventions that support local stakeholders in driving change through locally suited and participatory processes including, but not limited to, policy- and decision-making, investments, research, innovation, and learning.

It gives us great pleasure to have served as Knowledge Partner to ASSOCHAM and drafting this Knowledge Paper on "Curbing Nutritional Attrition to Achieve Nutritional Security through Agri-Nutri-Food Value Chain" that is expected to discuss this issue and strategize to mitigate its ill-effects.

I take this opportunity to congratulate ASSOCHAM for sensing the dire importance of this issue and organising the timely conference.

Thank you.

Suraj Nangia

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Executive Summary

Nutrition, Food Security and Livelihoods are largely interconnected, more so in the Indian context where agriculture, including livestock, remains the principal source of livelihoods for almost 60 percent of rural households and 86.2 percent of Indian farmers, who are small and marginal holders.

India is undergoing rapid economic growth and undernutrition continues to be a major problem. Protein Energy Malnutrition (PEM), micronutrient deficiencies such as vitamin A deficiency, Iron deficiency, Iodine Deficiency Disorders (IDD) and vitamin B-complex deficiencies are some of the undernutrition problems. What is more alarming is the prevalence of overnutrition, equally in developed and emerging economies, especially in the urban areas. It is important to note that Malnutrition includes overweight and obesity, undernutrition, as well as micronutrient deficiencies.

Value chains are a core element of food systems and most crucial in creating an enabling environment to promote nutrition-sensitive food systems, agricultural policies and interventions, and effective nutrition education strategies. A multisectoral approach is needed – including agriculture, education, physical activity, healthcare services, safe drinking water, sanitation, and socio-economic development, all of which strongly influence nutrition and health.

Sustainable Agri-Nutri-Food Value Chain can address nutrition problems by shaping food value chains to increase supply and demand of nutritious and safe food. Interactions among different commodities within the food system must be seen holistically, tackling nutrient gaps, and not ignoring the environmental risk of reducing diversification.

Any intervention should consider the current nutrition situation to identify locally suitable food crops to improve - nutrition, market demand, and farm-income. However, translation of knowledge into action calls for the coordinated efforts of several sectors and stakeholders. Effective IEC strategies and other large-scale educational campaigns should be integrated with the existing national nutrition and health programs.

CHAPTER 1

Nutrition, Agriculture and Food Systems

The term food security has been around for at least 50 years and has undergone many changes. Earlier, it was synonymous with national or regional level food availability, but more recently, it has been used to determine the accessibility and entitlements at community and household level.

According to FAO, food security means that “all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life”.

The term nutritional security on the other hand is comparatively recent and focuses more on health and related aspects. It can be defined as “adequate nutritional status in terms of protein, energy, vitamins and minerals for all household members at all times”¹

Thus, nutritional security broadens the concept of food security. “Food and Nutrition Security is achieved, if adequate food (quantity, quality, safety, socio-cultural acceptability) is available and accessible for and satisfactorily utilized by all individuals at all times to live a healthy and happy life.”²

Today's rapid dietary changes can be attributed mainly to urbanization, rising incomes, and societal changes - including greater participation by women in labor markets, developments in technology, business strategies, and public policy.³

In 2016, the UN General Assembly proclaimed the period from 2016 to 2025 the United Nations Decade of Action on Nutrition - “Nutrition Decade”, with FAO and WHO leading the implementation along with the WFP, IFAD and UNICEF.⁴ This Decade of Action aims to trigger intensified action to end hunger and eradicate all forms of malnutrition worldwide, and ensure universal access to healthier and more sustainable diets – for all people, wherever they are and wherever they live.

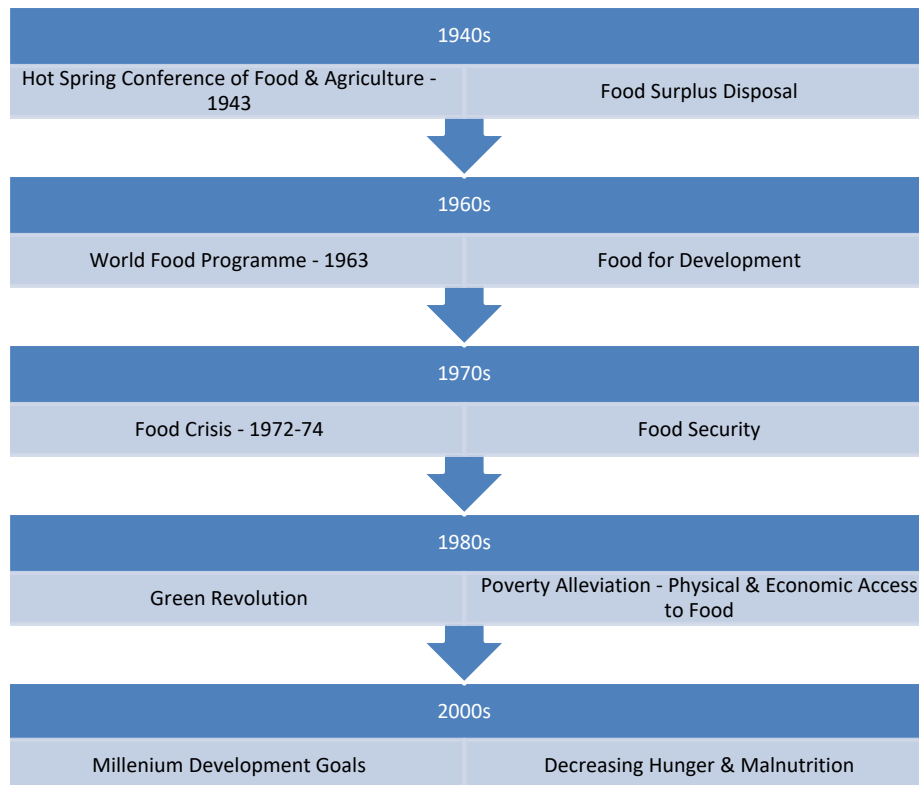
Agriculture has a very important role to play in healthy diets and acts a crucial link between health/nutrition and biodiversity. Increasing predominance of just three crops (wheat, rice and

1 Qisumbing, A.R. et al. 1995: Women: The key to food security. IFPRI Food Policy Report. Washington

2 Lioba Weingärtner, Rottenberg, 2009: The Concept of Food and Nutrition Security. InWEnt – Internationale Weiterbildung gGmbH, Feldafing

3 Sonja J. Vermeulen, Toby Park, Colin K. Khoury, Christophe Béné. 2020: Changing diets and the transformation of the global food system. Annals of the New York academy of sciences. New York

4 Joint FAO/WHO Secretariat of the UN Decade of Action on Nutrition. 2017: United Nations Decade of Action on Nutrition 2016-2025. Work programme. New York



maize) in the global agricultural food production and consumption has led to loss of biodiversity and agri-landscapes. It has also led to increased risks to - losses in production (due to pests and climate change), income (smallholder farmers) and undernutrition (including macro and micro). The different services a biodiverse ecosystem provides leads to ecosystem resilience, which is important for food, nutrition and income security. The diversity of foods in a production landscape and the nutrients they contain will have a direct impact on human health and the nutrition status of people living in that system.⁵ The loss of agricultural biodiversity is recognized by the Rio Convention on Biological Diversity and the SDGs, as when we lose agricultural biodiversity, we also lose the options to make our diets healthier and our food systems more resilient and sustainable.

Achieving positive nutritional outcomes requires consideration not just of the way food is produced (agriculture), but also of how it is processed, distributed, marketed and consumed (food systems). Food Systems can contribute to nutrition by extending the shelf-life of fresh food, maintain the food quality over time, and enhancing safety, palatability and convenience of transportability. Food system has been influenced by urbanisation, changing lifestyles and dietary patterns, and has, in turn influenced the availability, accessibility, affordability and desirability of food.

⁵ J. Bélanger & D. Pilling (eds.), 2019: The State of the World's Biodiversity for Food and Agriculture. FAO Commission on Genetic Resources for Food and Agriculture Assessments. Rome

CHAPTER 2

Rationale for Focusing on Food & Nutrition Security

“ Every man, woman and child has the inalienable right to be free from hunger and malnutrition in order to develop fully and maintain their physical and mental faculties ”

– United Nations 1974

Today, nearly one in three persons globally suffers from at least one form of malnutrition: wasting, stunting, vitamin and mineral deficiency, overweight or obesity and diet-related non-communicable diseases. Where multiple forms of malnutrition exist simultaneously in the same population groups and individuals, it is known as double burden of malnutrition. Sometimes this is even referred to as the triple burden of malnutrition, with micronutrient deficiencies considered as separate from undernutrition. This calls for action on malnutrition in all its forms because:

- Nutrition is critical to both health and economic development
- Addressing malnutrition is essential to achieve the SDGs
- Leads to integrated solutions having impact on all-round development
- Promotes maternal, infant and child health which in turn leads to a healthier working population
- Supports stronger immune systems and prevents secondary infections
- Reduces the risk of disease
- Has a favourable impact on other goals like education, women-empowerment, ending poverty etc.

In fact, the effects of poor nutrition begin in the womb. The period between conception and first two years of child growth, also known as first 1000 days, has considerable impact on health, intellectual development and overall well-being of an individual; and by implication on the entire nation.

Although the nutritional needs keep changing throughout the life cycle of an individual, there are certain groups which are particularly vulnerable, such as:

- Women of reproductive age (including pregnant and lactating)
- Children
- Adolescent girls

In reality, immediate causes of malnutrition are directly related to an individual's dietary intake and ability to absorb nutrients, but the underlying causes include social and economic related factors that affect nutrition status at the household level. These emerge from the political and social environment that controls the decision-making processes determining access, availability and affordability of nutritious food at the household level.

Therefore, Governments and Organisations like FAO and WHO, come up with guidelines from time to time such as:⁶

Food-Based Dietary Guidelines

- To help countries determine which foods, food groups and dietary patterns promote healthy diets.

Minimum Dietary Diversity for Women

- An indicator of whether women 15-49 years of age are achieving an adequate level of micronutrient intake, by determining if they have consumed at least five out of ten defined food groups in the previous day or night.

Nutrition education, vitamin A supplementation and breast-feeding promotion are among the most cost-effective public health interventions in terms of disability adjusted life years (DALYs) gained (World Bank 2001).

Malnutrition is one of the most important causes of underdevelopment and poverty and investments in nutrition is an investment in human capital. There are positive implications on adult labour force participation and productivity, maternal and child health and education, increased livelihood opportunities and income, and ultimately on overall development of the nation.

⁶ FAO and WHO. 2019. Sustainable healthy diets – Guiding principles. Rome

CHAPTER 3

A Multisectoral Approach to Nutrition

Multi-sector and multi-stakeholder platforms are semi-structured processes that allow actors from different economic sectors and government departments to come together for working around a shared set of concerns. They aim at solving a specific problem which requires expertise and resources beyond that of a single sector, and is in the shared interests of stakeholders from multiple sectors. Good nutrition is a direct result of food, but there are non-dietary factors which exert positive or negative effects on nutrition. These factors could be water, sanitation, hygiene etc. and might need additional activities to be carried out outside of the nutri value chain and demand coordination with organisations working in such other fields. Nutrition also involves multiple types of stakeholders such as government, civil society, academia and the private sector. All these sectors and stakeholders are involved in different ways in influencing nutrition outcomes within a country.

These efforts require cross-sectoral nutrition workshops and other such platforms where experts from multiple sectors - like community health worker, NGO, nutrition practitioners, agriculture officer etc., share their views on nutrition. The idea behind such multi-sectoral workshops/platforms should be to develop a compilation of socio-economic conditions, gender issues, policy and programme shortcomings etc., to form a consensus around key economic, cultural, social and political factors that have an impact on nutrition. Mapping stakeholders and relevant policies and programmes holds the key to the success of such multi-sectoral platforms.

Such efforts lead to the formation of departmental working groups on nutrition, value-chain actor alliances and civil society groups to aid, advise and direct the national efforts towards tackling malnutrition. It may even result into a National level Multi-sectoral Nutrition Strategy to complement the various departmental strategies. Such a national strategy may consequently lead to district level efforts, policies around nutrition education and behaviour change communications, and investments to diversify food production systems.

Thus, stakeholders can form and run sustainable nutrition efforts and achieve lasting results by bringing multiple sectors together. Addressing the determinants of nutrition requires a multi-sectoral and a multi-level strategy to ensure coherence and coordination among sectors apart from their individual action. By linking actions across key sectors like agriculture, health, water, sanitation etc., and ensuring policy coherence and programmatic convergence, multi-sectoral strategies can effectively address malnutrition. For instance, agricultural stakeholders need to be sensitised on how agriculture, food value chains and the overall food system influences nutrition. This should be followed by actionable insights and training on how they can contribute to nutrition through their sector as well as working in tandem with other sectors.

Designing such Multi-sector and multi-stakeholder platforms is not easy, mainly because as different sectors and stakeholders start coming closer, the level of engagement and dynamics change. The activities range from simply exchanging information to organising joint action and furthering deeper understanding for a more sustainable collaboration. They are conceptualised to leverage integration of resources and strategy among stakeholders, but to getting to such a level of cooperation, coordination or collaboration requires a lot of effort to build mutual trust and respect for each other's work.

Managing such platforms is even more challenging because of unclear lines of accountability and control, voluntary participation and informal environment. Such challenges can be dealt by:⁷

- Embracing systemic change
- Minimising power gradient among members
- Resolving conflict
- Effective communication

There are distinct phases of evolution of such platforms, although it is not linear as shown below, rather it indicates different needs and priorities at different stages.



Such platforms can be effectively used to set put necessary actions, roles, timelines and effective plans to achieve nutritional goals. At the household level, major goals include food security (through targeted public distribution), dietary diversification (enhanced micronutrients and bioavailability of diets), use of fortified food and double fortified salt, kitchen gardens and good cooking practices, and nutrition education through increased awareness about balanced diet. At the community level, some of the goals include regular observation of village health sanitation and nutrition committee meetings, and village and health nutrition days, monitoring of the regular and good quality supply of supplementary food at Anganwadi centers and mid day meals in schools, regular and continuous supply of safe drinking water, strengthened open defecation free (ODF) campaign, sustainable and good agricultural practices (including livestock), and ensuring availability of nutritious and good quality foods in the local markets.⁸

But such goals should be set out in collaboration with key stakeholders allowing all to provide inputs in the process. This is to ensure participation from stakeholders who do not have nutrition as a core mandate to feel a sense of ownership over the tasks assigned and overall strategic goal.

⁷ <https://msptoolkit.scalingupnutrition.org/topic/principles-for-effective-msps/>

⁸ Sharma S. A conceptual model and framework of nutrition sensitive and specific interventions across Life stages in India. J Family Med Prim Care 2021;10:3976-82

CHAPTER 4

Assessing the Current Food and Nutrition Security Situation in India

The national food security act 2013 guarantees subsidised food grains to vulnerable households. Ministry of Health and Family Welfare, Government of India, had launched the Anemia Mukta Bharat (AMB) program in 2018 with an ambitious target of a three-point percent annual reduction in the burden of anemia. The AMB program underlines six strategies, including increased testing and follow up for haemoglobin, IFA tablets supplementation, deworming, intensive behaviour change communication, mandatory provision of IFA fortified foods in public health programs, and address of non nutritional causes of anemia, such as malaria, etc.

Integrated Child Development Service (ICDS) scheme has been in existence for the past 50 years now to improve nutritional status of children, pregnant and lactating women, and adolescent girls. It provides for supplementary food, preschool education, primary healthcare, immunization, health check-up and referral services to children under 6 years of age and their mothers through Anganwadi centres. In 2018, the government of India launched Poshan Abhiyan (National Nutrition Mission) as an umbrella program to support nutrition interventions for children, adolescents, and mothers. It aims at improved training and capacity building of ICDS functionaries on nutrition (Anganwadi workers, ASHAs etc.) through incremental learning approach (ILA) and establishment of nutrition resource centres.⁹

To ensure food security to children and adolescents in schools and improve school retention, the government of India has been running a mid day meal program since 1997 98 across the country. The cooked food served in schools through mid day meals aims to cover one third of the total calories and half of the protein requirements of children.¹⁰

Nutrition sensitive interventions for adolescents include prevention of early marriage, promotion of girls' education, improving self efficacy, confidence, and life skills of adolescents, targeting their unmet needs of contraception, improved water and sanitation hygiene (WASH) practices, and peer support (under National Adolescent Health Program; Rashtriya Kishore Swasthya Karyakaram). Realizing the multi-dimensional needs of out of school pre-adolescent girls (11-14 years) and with a aim to motivate these girls to join school system, the Government approved implementation of restructured Scheme for Adolescent Girls (SAG) to focus on out of school

⁹ Ministry of women and child development, government of India. Poshan Abhiyan. <https://icds-wcd.nic.in/nnm/home.htm>.

¹⁰ Sharma S. A conceptual model and framework of nutrition sensitive and specific interventions across Life stages in India. J Family Med Prim Care 2021;10:3976-82

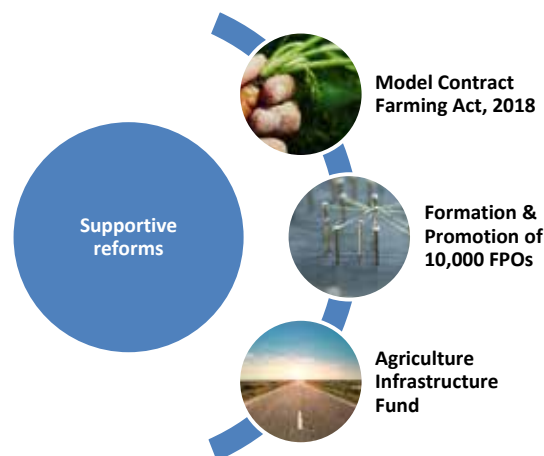
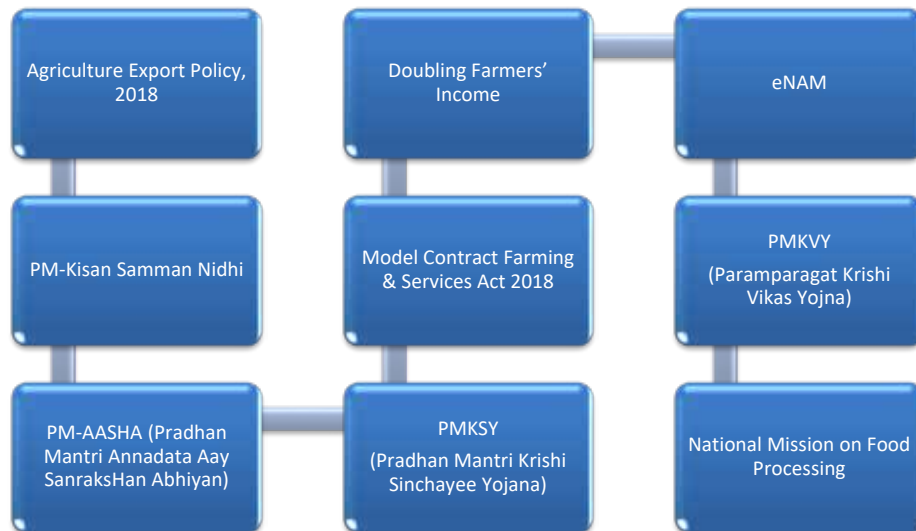
adolescent girls in the age group of 11-14 years. SAG is implemented through the ICDS scheme through Anganwadis.

Promoting contraception use to delay the first child, women empowerment (social, economic, and educational) for improved social well being and decision making, improved intra spousal communication to promote women's role in household decision making, and improved employment of women through linkage with employment generation schemes like the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in rural areas, urban livelihood mission, etc. are the major nutrition sensitive interventions for young married women.

Similarly, women empowerment for improved social well being and decision making, increased familial engagement, support, and care to mothers, enrolment in maternity schemes or programs like Janani Suraksha Yojna (conditional maternity benefit scheme), Pradhan Mantri Surakshit Matritva Abhiyan, Pradhan Mantri Matru Vandana Yojna, and Janani Shishu Suraksha Karyakaram (JSSK), and other state specific schemes, and improved uptake of quality antenatal care.

At last, for lactating mothers, enhanced post partum contraception and care, home based care of the newborn and infant, increased screening of children for defects, delays in development, diseases, and deficiencies under the national children health program (Rashtriya Bal Swasthya Karyakaram; RBSK) and effective management of diarrhea, pneumonia, and other childhood illnesses, and improved immunization.

Some of the agriculture sector policies and programmes are as highlighted below:



Despite all these efforts by the government, the programmes and policies have a limited reach and impact mainly due to lack of a community approach. Community approach focuses on enabling people to exercise collectively their responsibility to their own health and nutrition; and demand it as their right. This is enabled by an increasing involvement and participation of the community through formal and informal organisations and committees in decision making for nutrition including planning, financing, organising and evaluation of nutrition actions.

The community health approach means involvement and participation of the large sections of the community, who do not participate adequately in decision making at present i.e. the poor, the under-privileged, and the marginalized. It therefore, accepts that in terms of process, efforts to imbibe the concept and the spirit of community, to improve group dynamics and group inter-relationships are preliminary to evolving community actions of any sort. Hence through all the Government programmes and activities, the community building process should be promoted and enhanced.

CHAPTER 5

A Sustainable Food Value Chain for Nutrition - Framing Sustainability and Nutrition in Value Chains

Food Systems encompasses the entire range of actors involved in agriculture, forestry and livestock; and their interlinked value adding services; including production, aggregation, processing, distribution, and even consumption and disposal. Effective food systems should ensure that diverse, nutritious food is always available and affordable for all.

However, food systems do not operate in silos, and depend upon other systems such as energy, trade or health, for effective functioning. This makes them prone to structural changes even when a change is made to the other system such as energy – a policy effecting biofuel mixing has an impact on food system.

Applying a nutrition lens to consideration of how to resolve problems in supply and demand helps to identify specific investments and interventions for key foods that address the nutrition problem. Value chain investments can also contribute to nutrition relevant dimensions of the target population's livelihoods.

The three potential strategies for shaping food value chains so that they respond to the nutrition problem are:¹¹

Increase supply of nutritious food	Increase demand for nutritious food	Increase nutritional value of food
<ul style="list-style-type: none"> • Strengthening coordination among VC actors • Higher-value activities closer to production stage • Product & Process upgradation 	<ul style="list-style-type: none"> • Nutrition labelling • Behaviour change communication • Social marketing • Nutrition Education • Improving access & availability 	<ul style="list-style-type: none"> • Adding nutrients through food fortification • Biofortification • Minimising food loss and wastage • Nutrient-saving processing

¹¹ Isabel de la Peña, James Garrett, Aulo Gelli. 2018: Nutrition-sensitive value chains from a smallholder perspective. IFAD. Rome

Agricultural biodiversity includes all components of biodiversity of relevance to food and agriculture and can be defined as "the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, which are necessary to sustain key functions of an agricultural ecosystem, its structure and processes". It includes:

- Agro ecosystems
- Crop species and varieties
- Livestock species and breeds
- Plant/animal germplasm
- Soil organism in cultivated areas
- Biocontrol agents for crop/livestock pests
- Wild relatives of crop and livestock species
- Traditional knowledge on agrobiodiversity

Many components of agricultural biodiversity critically depend on human activity, because whatever is not actively used – as in cultivated, held, processed, sold, eaten, etc. – can be ultimately threatened with extinction. Farmers' communities play a key role as custodians and managers of agricultural biodiversity, especially traditional species, varieties, cultivars and breeds, that hold great cultural value for local people, and are often well-adapted to local and low-input agricultural ecosystems. This is why local and traditional knowledge and culture are considered as integral parts of agricultural biodiversity management (CBD, 2000).

The modern food production systems may have achieved the calorie quota needed to feed a rapidly expanding population, but they neglected to take into account nutrition. The consumption of calorie-rich but nutrient-poor crops of predominantly wheat, rice and maize has led to widespread malnutrition - even in people who consume enough calories. Therefore, the true challenge is not only how to feed a predicted 9 billion people by 2050, but how to nourish these people while facing global changes (Biodiversity International, 2015).

As a result of the shift in diets and lifestyle, many countries underwent a nutrition transition: a shift from a high prevalence of undernutrition to increased overweight and obesity in the population. This was accompanied by higher prevalence of non-communicable diseases such as diabetes, cardiovascular diseases and cancer, with negative impacts not only on health systems but also dramatic economic, social and environmental implications.¹²

Therefore, mainstreaming agricultural and food biodiversity can be explored as a channel to better nutrition. Promoting, growing, marketing and consuming diverse foods can ensure a healthy population. The nutrient content of various plants can differ greatly between species, as well as among different varieties and cultivars, so much so that consuming one food rather than another can mean the difference between adequate or inadequate intake of one or more nutrients (Biodiversity for Food and Nutrition Project).

¹² Kennedy et al., 2006; Johnston et al., 2014 Definition of dietary diversity: Steyn et al., 2006

CHAPTER 6

Measuring, Understanding & Improving Performance of Food Value Chains – Sustainability Aspects

Each food Value Chain (VC) is unique, but while examining the potential to improve nutrition, a nutri value chain analysis would not only include criteria like potential market demand, its impact on producer income, ability to improve dietary habits etc., but also multi-commodity approach within the food system can be adopted to address nutrition issues.

VC analysis usually starts by mapping the entire value chain from beginning to end in terms of functions and inter-relationships of its actors. Additionally, the challenges and opportunities are also identified for possibilities of improvement. When we introduce the nutrition and sustainability aspects it becomes much more complex and more problem oriented than the usual analysis, for example - how to cater to nutritionally poor and vulnerable groups by bringing about a change in VC strategy, or how to enhance food nutritional value and safety across the VC? The first stage of such a nutri value chain analysis would be to measure the performance of a value chain in terms of the economic, social and environmental outcomes it delivers. This helps in outlining the efforts required to target VCs with the greatest gap between actual and potential performance.

The second stage would be to understand the performance of a value chain with respect to its core drivers of under performance like linkages between VC actors, their behaviour and business interactions, determination of value in the market.

The third stage strives to improve the performance of the value chain through actions aimed at achieving specific objectives as per the VC development strategy that stakeholders agree upon.

The real challenge is to identify such foods that have the potential to address the nutrition problem and for which there is enough market demand to make it financially viable.

Selection Criteria	Key Considerations
Has the potential to address the nutrition problem	<ul style="list-style-type: none"> ● can bridge dietary gap ● contains key nutrients ● is acceptable to the community
Has the potential to generate demand in the market	<ul style="list-style-type: none"> ● strong VC actor interest ● services, knowledge, technology and infrastructure availability ● potential for growth
Income augmenting potential for the producers	<ul style="list-style-type: none"> ● low barriers to entry ● familiarity with the food ● high margins and low risk ● potential for on- and off-farm jobs
Gender considerations	<ul style="list-style-type: none"> ● is gender neutral ● doesn't result in negative consequences for equity ● potential to improve women's nutrition
Environment and climate change considerations	<ul style="list-style-type: none"> ● positive implications ● climate resilience ● opportunities to promote green growth

CHAPTER 7

Supporting Nutritional Outcomes through Sustainable Food Value Chains for Nutrition

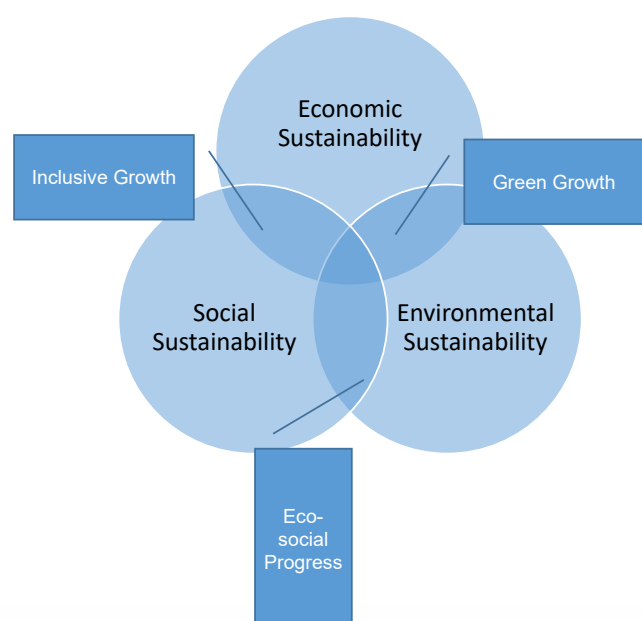
Value chains are core elements of a food system, and all food systems are made up of multiple value chains. A value chain comprises all the activities involved in a particular commodity's movement through the food system, from production to market destination and the final consumer with value being added at each stage.

Modern value chains can supply a wide variety of foods and conveniently provide diverse, safe and nutritious food year-round, including, fresh, primary and highly processed food products. However, modern value chains often promoted foods high in fat, sugar or salt level, which can lead to higher levels of non-communicable diseases and obesity.

The nutritional outcomes delivered by value chains depend upon various factors including agricultural input prices and markets; technical capabilities; availability of adequate energy sources, financial services, and infrastructure etc.

A sustainable food system is the one which delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised (FAO, 2018). Similarly, sustainable food value chains comprise of the full range of farms and firms and their successive coordinated value-adding activities that produce particular raw agricultural materials and transform them into their particular food products that are sold to final consumers and disposed-off after use, in a manner that is profitable throughout, has broad-based benefits for society and does not permanently deplete natural resources (FAO, 2014).

Sustainable food systems and value chains deliver food security and nutrition for all through three dimensions of sustainability:



Social sustainability is the one concerned with producing good nutritional outcomes and ensuring that they are achieved in inclusive, equitable, ethical and respectful ways. But in reality, applying nutrition and sustainability perspectives to food systems would invariably lead to trade-offs and they have to be managed by applying economic, social and environmental principles. Few ways of managing nutritional outcomes while also ensuring sustainability are:

- Balancing nutrition and economic sense through appropriate commodity selection.
- Reducing transaction costs and improving linkages between value chain actors.
- Quality assurance and technology/information extension services through collaboration between farmers and forward linkage actors.
- Platform for regular discussions and dialogue between value chain actors.
- Initiatives to assess and improve local agrobiodiversity and food management.
- Adoption of agro-ecological approaches to production.
- Diversification – for increased pest resistance and soil health
- Traditional and high potential foodcrops which are more adapted to local conditions

Combined set of principles shaping transitions towards Sustainable Food Systems for Food Security and Nutrition:¹³

Principle	Guidance for Action	Explanation
Regenerative production	Harness ecosystem services (ES) and natural processes in the productive process, optimizing the use of local renewable resources and minimizing negative externalities	The use of natural processes in agricultural and food systems rather than their substitution with alternatives (purchased inputs that often involve the use of fossil fuels in their manufacture) can enhance soil health (through managing soil organic matter and biological activity) thereby regenerating the capacity of land to provide ES.
Recycling and efficiency	Increase resource-use efficiency and reduce or eliminate dependency on purchased inputs	Deliberate management of agriculture and food systems that favours recycling, can reduce dependency on purchased inputs and risk or debt associated with their use, eliminates or reduces leakage of key resources (such as biomass and nutrients), and can enhance efficiency of resource use and resilience.

¹³ HLPE. 2019. Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.

Animal health	Ensure animal health and welfare	Food systems that ensure animal health and welfare are more efficient, sustainable and socially acceptable.
Synergy	Enhance positive ecological interactions, integration and synergies between different components of agroecosystems	The deliberate management of interactions and synergies among functionally diverse components of agroecosystems enables the development of more efficient and resilient systems.
Diversity	Maintain and enhance diversity of species and genetic resources and maintain biodiversity in the agroecosystem over time and space, at field, farm and landscape scales.	The deliberate use of greater agrobiodiversity in agriculture and food systems than is typical in monoculture systems, can make them more ecologically and economically efficient and resilient and contribute to the development of healthier, diversified and seasonally (and culturally) appropriate diets.
Integration	Increase integration of system components throughout the food system to realize greater benefits and opportunities.	Deliberate management of interactions among components of food systems across scales can achieve greater integration, resulting in more efficient and sustainable performance throughout the food value chain.
Climate change adaptation and mitigation	Design and use agricultural practices that contribute to climate change adaptation and mitigation	Adoption of climate-smart agricultural practices can increase adaptation to climate change by targeting specific climate hazards and/or improving resilience of livelihoods at the same time as sequestering carbon and reducing emission of greenhouse gases.
Knowledge production and dissemination	Enhance co-creation and horizontal sharing of knowledge including local and scientific knowledge and innovation.	Experiential learning and knowledge-sharing among practitioners, and co-production of knowledge among multi-stakeholder networks, enhance its legitimacy and generates innovation adapted to the local context.

<p>Cultural coherence</p>	<p>Build food systems based on culture, identity, social and gender equity, innovation and knowledge, that include healthy, diversified, seasonally and culturally appropriate diets of local communities and livelihoods</p>	<p>Food systems based on local culture and identity, along with being equitable and connecting producers and consumers, are likely to be sustainable.</p> <p>Reduction of meat, salt, sugar, ultra-processed foods and other unhealthy dietary practices in many diets can lead to better nutrition and health outcomes, as well as greater sustainability.</p>
<p>Human and social values</p>	<p>Support dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights</p>	<p>Implementing fair trade, fair employment, fair intellectual property (including with respect to genetic resources), access to natural resources and social and gender equity measures can contribute to creating and maintaining fair, dignified and robust livelihoods for all actors engaged in food systems.</p>
<p>Connectivity</p>	<p>Increase proximity and confidence of producers and consumers through fair and short distribution networks that embed food systems in local economies. Support alternative production and consumption models.</p>	<p>Better connecting producers and consumers (through shorter supply chains, re-embedding food systems in local economies, encouraging a circular economy) leads to greater trust and confidence among producers and consumers in the quality and safety of food and less waste along food chains.</p>
<p>Governance</p>	<p>Recognize food as a basic human right; democratize the process of innovation and the control of food systems.</p>	<p>Recognizing food as a basic human right and increasing democratic control of food systems are key measures that have clear impacts on FSN.</p> <p>Institutions with numerical and substantive representation of all actors within food systems and their participation in decision-making are required for their equitable and democratic governance.</p>

Empowerment	Recognize and support the needs and interests of key stakeholders in food systems (especially family farmers, smallholders and peasant food producers, and consumers).	Adopting measures to support interests of smallholder and family farmers as sustainable managers and guardians of natural and genetic resources counteracts market failures that favour economies of scale with negative externalities.
Participation	Encourage social organization and greater participation of food producers and consumers in how food systems operate with particular measures to include marginalized groups	<p>Encouraging social organization and greater participation and decision-making of food producers and consumers will support decentralized governance and local adaptive management of food and agricultural systems.</p> <p>Democratization of innovations promotes ways that communities of people can share information and knowledge across distributed networks and contributes to innovation most appropriate for local contexts.</p>

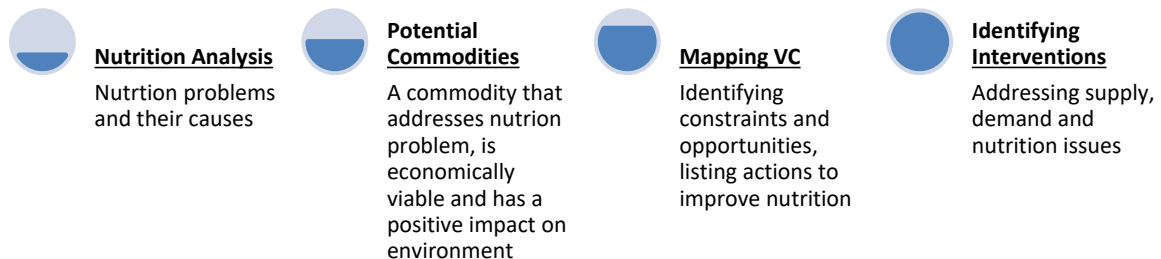
CHAPTER 8

Nutri value chains: entry points, challenges and opportunities for smallholders

Nutri Value chains or Sustainable Food Value Chains for Nutrition differ considerably from a typical value chain because nutri value chains aim to deliver better nutrition to the consumers and producers whereas a typical value chain aims to make it more effective and valuable for each actor.

A typical value chain	Nutri value chain
Prerequisite: Market analysis	Prerequisite: Nutrition analysis
Selection criteria is market potential and income-generation potential.	In addition, it aims to improve nutrition potential and balance gender and environmental aspects.
Value chain analysis (VCA) includes mapping of VC actors and identifying oportunities for VC upgradation.	VCA aims to increase nutritional value and food safety and reduce food wastages. It also aims to increase the demand for nutritious food from market and end consumers.
A typical intervention addresses the supply constraints.	In addition, it also addresses demand and nutrition value.

An intervention design under Nutri value chain or Sustainable Food Value Chains for Nutrition would comprise of the following steps:



As discussed in chapter 6 there are 3 main strategies by which a value chain can me made to improve nutrition: increasing the supply of the nutritious food, by increasing its demand, or by adding nutritional value to it. These strategies can be made to work mainly through three impact pathways to enable change in diet leading to improved nutrition. These three impact pathways are:

Income Pathway

- Value chain development can raise incomes and improve economic returns through improved efficiency, value addition, increased sales and profits or employment generation. This increased income for VC actors can subsequently be used to improve their diets through increased purchase of nutritious food.

Market Pathway

- By leveraging the potential of markets for nutrition, a Food Value Chain for Nutrition can act on demand and supply and contribute to increased availability, affordability, food safety, nutritional quality and acceptability of food in the marketplace.

Own-production Pathway

- For producer households, enabling production of more nutritious food can also give them the possibility of consuming it more from their own production.

Women empowerment and nutrition

Women are in a unique position at the interconnection of agriculture and nutrition as they are responsible for food choices, consumption and preparation within the household, as well as for childcare and feeding.

Therefore, attention to impact and improvements in women's decision-making power and control over resources can have significant positive effects on not just their own nutrition but on the entire household.

There are certain challenges that need to be addressed while advocating nutri value chains. Nutrition depends on diverse food and non-food factors, and value chains typically focus only on food, and that too single commodity. This can be addressed by adopting a multi-sectoral approach to improving nutrition (as discussed in chapter 2) and by creating complementarities between various value chains. Diversification of production and promoting agrobiodiversity as discussed in previous chapter is another factor that needs to be kept in mind to reduce producer's and environmental risks.



CHAPTER 9

Macro and Sector-Policies in Food and Nutrition Security

In the face of COVID 19 pandemic, strengthening the food systems to ensure affordable nutritious diets for all has again gained significant importance, and rightly so. Countries are struggling to implement context-specific policies and strategies, juggling between short- and medium-term goals, striving to channel public and private sector funds, and aiming for improved planning and coordination across sectors and actors.

All these efforts must result into reduced costs of nutritious foods and enhanced purchasing power of the poor and vulnerable groups. This can be achieved by introducing nutrition sensitiveness into agriculture-allied sectors and overhauling the entire food system.

Macroeconomic policies: Includes monetary, fiscal and budgetary provisions at national level. These determine the volume of money supply and interest rate, and the impact is mostly indirect, but it significantly impacts the investment of VC actors (e.g. farmers, traders, transporters), employment and income.

Agricultural policies: Includes agri-research, training and extension, agri-input policies, land policies, agricultural finance and infrastructure policies, and natural resource conservation policies. Agriculture is probably the only sector which has an effect on both supply and demand of nutritious food because of a significant population depending on agriculture for their livelihoods.

Marketing and Pricing policies: Includes all measures and regulations concerning markets of food and commodities. It also includes incentives, subsidies, farmer protection measures like MSPs, inflation control measures for essential commodities etc. Such policies have implication on both supply and demand side of agriculture and food sector.

Trade policies: Includes food import, domestic production and exports, tariff and non-tariff trade barriers and regulations. They govern the overall supply and prices of food in the market and thereby affect food access, affordability and availability.

Infrastructure policies: Infrastructure includes roads, warehouses, irrigation and other input services, Mandis and market yards, logistics and cold chain etc. These policies not only have implication on food supply and transportation, but also create significant employment and income improving ability to access to nutritious food.

Poverty alleviation and other social policies: Includes social safety net policies, insurance policies, targeted employment and income generation programmes, cash transfer schemes etc. These supplement the income by providing cash/kind transfers leading to improved access to nutritious food for the household.

Health policy: Health has a direct effect on nutrition and vice-versa. Therefore, policies impacting health sector also impact food and nutrition sector. This includes, water policy, sanitation policies, immunisation programmes, pandemic policies etc.

Education policy: Child health and nutrition programmes like Mid-day meal, ICDS, awareness generation programmes around health and nutrition, breastfeeding and complementary feeding promotion programmes like Poshan Abhiyaan, girl-child education and school re-joining programmes like SAG etc.

Population policy: Capacity of natural resources is limited and over-populations endangers food and nutritional security. Therefore, policies to curb population growth, girl-child education, sex education, birth-control programmes etc. play a crucial role.

As it is clear from the above discussion, nutrition is a cross-cutting policy issue and therefore demands baseline data on nutritional status, primary data collection of changing dietary patterns and diet gaps, policies to address imbalances in food markets and impairment of local food production, promoting nutritious food consumption through awareness programmes amongst others.

Some of the intervention areas include:

- Use of nutrient-saving storage methods, processing technologies
- Food Fortification and biofortification
- Promoting more nutritious varieties and new crops that reduce risk to food safety as well
- Cold chain infrastructure
- Developing local markets
- Promoting and building capacities of farmer-owned, farmer-led and farmer-managed enterprises like FPOs, cooperatives etc.
- Improving diet and nutrition education
- Introducing new production and post-harvest technologies to enhance supply of nutritious food
- Optimising and enhancing nutritional value along the value chain through fortification and combining different food chains into one.

- Behaviour change campaigns around a combination of objectives like – production, processing, marketing and consumption of specific foods; healthy diet and feeding practices; direct food transfers etc.
- Cooking demonstrations, reintroducing nutritious locally available nutritious food and recipes in modern diets, free- sampling etc.
- Improved Agri-Extension services to provide training, access to technology, inputs and credit
- Targeted intervention for vulnerable groups through social marketing campaigns, public procurement, and re-energised school meal programmes.
- Changes in consumption, healthy and hygienic nutrition practices at home through programmes centred around women empowerment and education.

CHAPTER 10

Potential and Limitations

In a country like India with diverse socio-economic base, food habits and diet patterns, complex food production systems, efforts to curb nutritional attrition to achieve nutritional security through Agri-Nutri-Food Value Chain is not easy. This would require synergies across the varied food value chains to improve performance from nutrition and sustainability point of view.

Nutri food value chains offer a lot of potential to curb malnutrition and promoting public health, food security, natural resource management and sustainability. The public and private sector has to come together to engage in a broad-based national nutrition strategy, multi-sector and stakeholder platforms for dialogue, safety-nets and social support programmes for vulnerable groups and the poor, nutrition education and awareness programmes, and environment and climate change production risk mitigation strategies, to direct the efforts.

Involving People through a democratic, decentralized, participatory, and empowering process is crucial to achieving success and it cannot be over-emphasised. Addressing root problems through revamped policies and programmes arising out of people-oriented strategies is much more likely to sustain the momentum and sure to bring success in the long-term.

Major limitations include time and resources. It will be a time-consuming process but the time to start is now, with small immediate steps towards the larger long-term goals. Resource crunch in a big country like India are inevitable, but the key is flexible programmes arising out of a lot of mutual trust and knowledge sharing between multiple sectors.

Lastly, broad concerns like environment and sustainability cannot be ignored when it comes to achieving food and nutrition security. One must move beyond economic and financial concerns, and towards achieving social and environmental goals in a sustainable manner.

CHAPTER 11

Conclusion and Way Forward

This report details the present situation, causes, effects and required efforts to curb nutritional attrition to achieve nutritional security through Agri-Nutri-Food Value Chain. It highlighted the concepts, frameworks and multi-sectoral nature of the problem and solutions towards sustainability and nutritional security.

Of course, Agri-Nutri-Food Value Chain cannot solve all problems related to nutritional security, but it offers a strategy which can be implemented through public programmes and policies to curb hunger and malnutrition.

To succeed in this mission, we have to recognise the diversity and complexity of our food systems and create opportunities to improve value chains through infusion of nutrition and sustainability aspects. Reorganising Agri-Nutri-Food Value Chains to remove the barriers in supply and demand of nutritious food, and to bridge the diet gaps by adding nutritional value is the way forward.

The Agri-Nutri-Food Value Chains have to designed in such a way that they address the nutritional needs of their respective regions and communities. The focus has to shifted from commodity to food system as a whole with multiple foods filling the nutritional gaps. Diet and nutrition education, food safety and quality, gender, environment and climate change, and sustainability concerns have to be kept at the forefront of all our efforts towards the goal of achieving food and nutritional security.

About ASSOCHAM

The Knowledge Architect of Corporate India

The Associated Chambers of Commerce & Industry of India (ASSOCHAM) is the country's oldest apex chamber. It brings in actionable insights to strengthen the Indian ecosystem, leveraging its network of more than 4,50,000 members, of which MSMEs represent a large segment. With a strong presence in states, and key cities globally, ASSOCHAM also has more than 400 associations, federations, and regional chambers in its fold.

Aligned with the vision of creating a New India, ASSOCHAM works as a conduit between the industry and the Government. The Chamber is an agile and forward-looking institution, leading various initiatives to enhance the global competitiveness of the Indian industry, while strengthening the domestic ecosystem.

With more than 100 national and regional sector councils, ASSOCHAM is an impactful representative of the Indian industry. These Councils are led by well-known industry leaders, academicians, economists and independent professionals. The Chamber focuses on aligning critical needs and interests of the industry with the growth aspirations of the nation.

ASSOCHAM is driving four strategic priorities – Sustainability, Empowerment, Entrepreneurship and Digitisation. The Chamber believes that affirmative action in these areas would help drive an inclusive and sustainable socio-economic growth for the country.

ASSOCHAM is working hand in hand with the government, regulators, and national and international think tanks to contribute to the policy making process and share vital feedback on implementation of decisions of far-reaching consequences. In line with its focus on being future-ready, the Chamber is building a strong network of knowledge architects. Thus, ASSOCHAM is all set to redefine the dynamics of growth and development in the technology-driven 'Knowledge-Based Economy. The Chamber aims to empower stakeholders in the Indian economy by inculcating knowledge that will be the catalyst of growth in the dynamic global environment.

The Chamber also supports civil society through citizenship programmes, to drive inclusive development. ASSOCHAM's member network leads initiatives in various segments such as empowerment, healthcare, education and skilling, hygiene, affirmative action, road safety, livelihood, life skills, sustainability, to name a few.

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