Gurukul International Multidisciplinary Research Journal (GIMRJ)*with* International Impact Factor 8.712
Peer Reviewed Journal
https://doi.org/10.69758/GIMRJ/2609I01VXIVP0005

e-ISSN No. 2394-8426
Monthly Issue
SEPT-2026
Issue– IX, Volume–XIV

From Food Sufficiency To Sustainable Food Leadership: Rethinking India's Food System

Vunguturi Naga Pavani Pranathi
5th year, BBA.LLB (Hons), ICFAI Law School, IFHE, Hyderabad
Email: vungutur ipranathi@gmail.com

Soyam Shipra
5th year, BBA.LLB (Hons), ICFAI Law School, IFHE, Hyderabad
Email:shiprasoyam@gmail.com

Abstract

It is vital for India to strengthen domestic capabilities, economic resilience and competitiveness while reducing vulnerabilities arising from excessive external dependence especially in the food sector. However, self-reliance cannot be assessed merely through aggregate food-grain production. Despite substantial progress in agricultural production, India continues to confront nutritional insecurity, post-harvest losses, dependence on imported edible oils and agricultural inputs, limitations in food processing, uneven food-safety compliance, climate vulnerability and fragmented regulatory governance. This paper examines self-reliance from an integrated food-systems perspective and argues that India's next developmental transition must move from food sufficiency towards sustainable food leadership.

Design/Methodology/Approach

The study adopts a qualitative, doctrinal and interdisciplinary methodology supported by secondary quantitative evidence. It analyses legislation, government policies, official statistical reports, public-health data, institutional publications and academic literature relating to agriculture, nutrition, food processing, food safety, sustainability and international competitiveness. Comparative experiences from Brazil, the Netherlands and South Korea are examined to identify selected policy lessons relevant to India.

Findings

The study finds that India's principal food-system vulnerabilities no longer arise exclusively from inadequate agricultural production. Instead, they emerge from weaknesses across the food value chain, including limited value addition, nutritional deficiencies, uneven safety and quality enforcement, strategic import dependency, inadequate infrastructure, climate-related risks and insufficient coordination between policy institutions. Existing government initiatives address several individual components of the food ecosystem, but the absence of an integrated food-systems approach limits their collective effectiveness.

Research Limitations/Implications

The study relies primarily on secondary data and policy analysis and does not undertake primary surveys or econometric modelling. Future research may empirically examine state-level relationships between food-processing infrastructure, agricultural productivity, nutritional outcomes, farmer income and export competitiveness.

Practical Implications

The paper proposes a six-pillar Food Independence Architecture (FIA) integrating production resilience, nutritional security, food safety, processing and value addition, environmental sustainability and global competitiveness.

Social Implications

A broader conception of food self-reliance can contribute to public health, farmer welfare, rural employment, environmental sustainability and equitable access to safe and nutritious food.

Keywords: Food Security; Nutritional Security; Food Processing; Food Safety; Sustainable Agriculture; Global Competitiveness.
Article Classification: Research Article

1. Introduction

The concept of economic independence acquired particular prominence in May 2020 when the Government of India articulated a vision of national self-reliance built around five pillars: economy, infrastructure, technology-driven systems, vibrant demography and demand (Government of India, 2020). Importantly, self-reliance was not presented as economic isolation. The underlying idea was to strengthen domestic capabilities and supply chains so that India could participate in the global economy from a position of greater resilience.

Food and agriculture constitute an important sector through which this vision can be evaluated. India has transformed itself from a country historically affected by serious food shortages into one of the world's major agricultural producers. Agriculture and allied activities continue to account for approximately 18 per cent of India's Gross Value Added, while the sector remains a source of employment for a substantially larger proportion of the country's workforce (Ministry of Agriculture and Farmers Welfare, 2026; MoSPI, 2026). The continuing difference between agriculture's contribution to economic output and its employment share illustrates the importance of productivity enhancement, diversification and greater value addition within the rural economy.

India's contemporary food challenge, however, extends beyond agricultural production. Food security in the twenty-first century concerns not merely the availability of calories but also affordability, dietary diversity, nutrition, food safety, environmental sustainability, supply-chain resilience and economic access.

The National Family Health Survey-5 demonstrates this distinction. Although several nutritional indicators have improved over earlier survey rounds, 35.5 per cent of children below five years were stunted, 19.3 per cent were wasted and 32.1 per cent were underweight. Anaemia affected 57 per cent of women aged 15-49 years (IIPS and ICF, 2021). These figures demonstrate that aggregate agricultural production cannot by itself be treated as evidence of nutritional security.

At the same time, the structure of Indian food consumption is undergoing significant transformation. Urbanisation, changing lifestyles, organised retail, digital delivery systems and the increased availability of highly processed food products are influencing dietary patterns. The World Health Organization has noted the rapid expansion of ultra-processed foods in India and the need for food-system policies that facilitate access to affordable and healthy diets (WHO, 2023).

India also continues to face strategic dependence in important parts of its food economy. Edible oils provide a particularly significant illustration. In 2023-24, domestic production met only about 44 per cent of India's edible-oil requirement, with import dependence estimated at approximately 56.25 per cent (NITI Aayog, 2024). Such dependence exposes domestic consumers and producers to fluctuations in global commodity prices, supply disruptions and geopolitical uncertainty.

These concerns suggest that the next stage of economic independence in the food sector must move beyond the question: Can India produce enough food?

The more relevant question is: Can India develop a food system that is simultaneously productive, nutritious, safe, sustainable, economically valuable and globally competitive?

This paper argues that genuine food-system requires a transition from food sufficiency to food leadership.

2. Research Gap

A substantial body of literature exists on Indian agriculture, food security, public distribution, nutrition, food processing, food safety, climate resilience and agricultural exports. However, these subjects are often examined within separate disciplinary and policy frameworks.

Food-security literature traditionally focuses on production, accessibility and welfare distribution. Nutritional scholarship examines malnutrition, dietary diversity and micronutrient deficiencies. Agricultural economics evaluates productivity, farmer income and markets, while food-processing research emphasises infrastructure, investment and value addition. Public-health literature increasingly examines processed-food consumption and diet-related non-communicable diseases.

Similarly, Indian policy architecture is divided between multiple institutional objectives. The National Food Security Act, 2013 focuses substantially upon access to subsidised food grains and nutritional entitlements (Government of India, 2013), while the Food Safety and Standards Act, 2006 establishes the statutory framework governing food safety and standards (Government of India, 2006). Schemes administered by the Ministry of Food Processing Industries focus upon processing capacity, cold-chain infrastructure, micro-enterprise formalisation and supply-chain development.

Each addresses an important component of the food system, but the interdependence between these components deserves greater attention.

For example, increased agricultural production does not necessarily increase farmer income where storage, processing and market linkages remain weak. Similarly, increased food availability does not guarantee nutritional adequacy. Expansion of food-processing capacity may generate employment and value addition, but without effective nutritional and safety regulation it may simultaneously contribute to unhealthy food environments.

Likewise, agricultural export competitiveness depends not simply upon the quantity available for export but upon traceability, certification, residue management, quality assurance and international regulatory compliance.

The principal research gap therefore lies in the absence of sufficient integration between production security, nutrition, food safety, value addition, environmental sustainability and global competitiveness.

This study attempts to bridge that gap through an integrated food-systems interpretation of self-reliance.

3. Research Objectives

1. To examine the limitations of a production-centric understanding of food self-reliance.
2. To analyse the major structural, nutritional, regulatory, trade-related and environmental challenges affecting India's food system.
3. To examine selected government policies relating to food processing, nutrition, food safety and agricultural resilience.
4. To assess selected international practices relating to nutrition-sensitive food policy, value addition and food-based cultural and economic diplomacy.
5. To develop an integrated Food Independence Architecture for strengthening India's long-term food resilience and global competitiveness.

4. Research Questions

RQ1: To what extent has India progressed from food-grain sufficiency towards comprehensive food-system self-reliance?

RQ2: What structural, nutritional, regulatory, environmental and trade-related challenges continue to constrain India's food system?

RQ3: What lessons can India derive from selected international approaches to nutrition, food value chains and food-based international competitiveness?

RQ4: How can economic Independence be reconceptualised to integrate food production, nutrition, safety, sustainability, value addition and global competitiveness?

5. Research Methodology

The paper adopts a qualitative, doctrinal and interdisciplinary research methodology, supplemented by secondary quantitative evidence.

The doctrinal component examines the legal and regulatory framework governing food security and food safety in India, particularly the Food Safety and Standards Act, 2006 and the National Food Security Act, 2013.

The policy-analysis component examines major programmes and institutions operating within the food ecosystem, including the Pradhan Mantri Kisan SAMPADA Yojana (PMKSY), Pradhan Mantri Formalisation of Micro Food Processing Enterprises Scheme (PMFME), Mission Saksham Anganwadi and POSHAN 2.0, food-safety regulation and programmes for increasing domestic edible-oil production.

Official data from the National Family Health Survey, Periodic Labour Force Survey, Ministry of Food Processing Industries, NITI Aayog and other government sources have been used to provide a descriptive empirical foundation.

The paper further adopts a comparative method by examining selected experiences from Brazil, the Netherlands and South Korea. These jurisdictions are not presented as models capable of direct transplantation into India. Instead, particular practices are examined for their relevance to specific dimensions of India's food-system challenges.

The present study does not employ econometric modelling because its central questions relate primarily to law, regulation, institutional design and policy integration rather than measurement of a particular causal effect. Quantitative evidence is therefore used descriptively and analytically rather than for causal inference.

6. Literature Review

6.1 Food Security and the Transition from Availability to Nutrition

Traditional approaches to food security placed considerable emphasis upon the availability and accessibility of staple foods. India's public procurement, buffer-stock and Public Distribution System architecture has played a fundamental role in preventing widespread food scarcity.

The National Food Security Act, 2013 represented an important rights-oriented development by creating statutory food entitlements for a substantial section of the population (Government of India, 2013).

Nevertheless, contemporary nutrition evidence demonstrates the limits of equating cereal availability with nutritional security.

NFHS-5 reported continuing prevalence of stunting, wasting, underweight and anaemia despite India's substantial agricultural production (IIPS and ICF, 2021). Consequently, food-security scholarship increasingly requires engagement with dietary quality, protein accessibility, micronutrients and diversity.

Mission Saksham Anganwadi and POSHAN 2.0 similarly reflects a policy recognition that malnutrition requires convergence between nutrition, health, sanitation and monitoring systems rather than food distribution alone (Ministry of Women and Child Development, 2022).

6.2 Food Processing, Infrastructure and Value Addition

Food processing occupies a critical position between agricultural production and economic value creation.

The Pradhan Mantri Kisan SAMPADA Yojana seeks to create modern food-processing infrastructure and improve supply chains from the farm gate to the retail level. Its components include integrated cold-chain infrastructure, agro-processing clusters, processing and preservation capacity, food-safety and quality-assurance infrastructure and Operation Greens (MoFPI, 2023).

Similarly, the PMFME Scheme focuses upon formalisation and technological and financial support for micro food-processing enterprises. The scheme provides credit-linked assistance, common infrastructure, capacity building, branding and support through the One District One Product approach (MoFPI, 2026).

These programmes demonstrate that food processing is increasingly recognised as part of rural development rather than merely an industrial activity.

However, infrastructure development alone cannot create a globally competitive food system. Processing must be connected with safety standards, traceability, logistics, certification, technological innovation and market access.

6.3 Food Safety, Processing and Public Health

The expansion of processed-food markets has created an additional dimension of food governance.

Processing itself should not automatically be treated as harmful. Processing can improve preservation, safety, accessibility and convenience. The regulatory concern arises from the composition and consumption of certain highly processed products, particularly where foods contain excessive amounts of salt, free sugars or unhealthy fats.

The NOVA framework developed by Monteiro et al. (2019) has been influential in distinguishing ultra-processed food products according to their formulation and degree of industrial processing.

In the Indian context, the World Health Organization has documented the rapid growth of ultra-processed foods and argued for stronger policy attention to healthier food environments (WHO, 2023). WHO also emphasises that healthy diets should be adequate, balanced, moderate, diverse and safe (WHO, 2026).

6.4 Climate Change and Food-System Resilience

Climate change introduces a structural threat to long-term food self-reliance.

The Intergovernmental Panel on Climate Change has concluded that climate-related risks to agriculture and food security in Asia will progressively increase as warming intensifies. Changing rainfall, droughts, extreme heat and other climate hazards may affect agricultural productivity, food affordability and supply-chain stability (IPCC, 2022).

Consequently, food self-reliance cannot be evaluated solely according to present production.

A food system may currently produce sufficient quantities of agricultural commodities yet remain vulnerable if its production structure depends upon unsustainable groundwater extraction, degrading soil quality, environmentally intensive inputs or highly climate-sensitive crops.

Long-term sustenance therefore necessarily includes climate adaptation and ecological sustainability.

7. Key Challenges to Food-System

7.1 The Agricultural Output-Employment Imbalance

Agriculture and allied activities account for approximately 18 per cent of India's GVA, while agriculture accounted for around 43 per cent of employment according to PLFS 2025 (Ministry of Agriculture and Farmers Welfare, 2026; MoSPI, 2026).

These measures are not directly equivalent and should not be mechanically interpreted as a productivity ratio. Nevertheless, the difference illustrates the continuing importance of increasing economic value generated through agricultural and rural activities.

Simply increasing the quantity of crops produced cannot adequately address this issue.

Greater value must be generated through processing, storage, logistics, branding, food manufacturing, agricultural services and integration with organised domestic and international markets.

7.2 Post-Harvest Losses and Weak Value Chains

Post-harvest losses continue to affect multiple agricultural commodities, although loss rates vary substantially between crops and stages of the supply chain.

A national NABCONS study commissioned by the Ministry of Food Processing Industries assessed harvest and post-harvest losses across 54 crops and commodities and examined losses occurring during harvesting, sorting, drying, packaging, transportation, farm-level storage, wholesale, retail and processing stages (Ministry of Food Processing Industries, 2025a).

This is important because food-system inefficiency should not be reduced to a single nationwide percentage.

Different commodities require different infrastructure solutions.

Perishable products may require refrigerated transportation and cold-chain facilities, while cereals may require scientific storage and moisture management. Fish, dairy, fruits and vegetables similarly require specialised handling systems.

Food-system self-reliance therefore requires infrastructure designed around commodity-specific vulnerabilities.

7.3 Limited Processing and Formalisation

India has increasingly recognised the economic importance of food processing through programmes such as PMKSY and PMFME.

PMKSY is intended to support modern infrastructure and efficient supply-chain management, while PMFME provides financial, technical and business support to micro food-processing enterprises (MoFPI, 2023; MoFPI, 2026).

Formalisation is especially important because micro and small food businesses frequently face difficulties involving access to finance, technology, packaging, branding, food-safety standards and organised markets.

However, formalisation should not become synonymous merely with additional licensing.

The policy objective should be to help enterprises become capable of complying with quality standards while simultaneously reducing unnecessary administrative barriers.

7.4 Nutritional Insecurity

India's nutritional indicators establish perhaps the clearest distinction between food availability and nutritional security.

According to NFHS-5, 35.5 per cent of children under five were stunted, 19.3 per cent were wasted and 32.1 per cent were underweight. Anaemia affected 57 per cent of women aged 15-49 (IIPS and ICF, 2021).

These indicators reveal that the next generation of food policy must focus upon the nutritional composition of diets.

A cereal-centric food-security architecture was historically important for preventing hunger. However, contemporary nutritional security requires adequate access to pulses, fruits, vegetables, dairy, eggs, fish, millets and other sources of protein and micronutrients according to regional food practices.

Self-Reliance must therefore include nutritional self-reliance: India's capacity to make nutritionally adequate and diverse food economically accessible to its population.

7.5 Food Safety and Consumer Confidence

Economic growth within the food-processing sector will not produce sustainable food leadership unless consumers possess confidence in the safety and quality of food products.

The Food Safety and Standards Act, 2006 created the statutory framework for science-based standards and food-safety regulation in India (Government of India, 2006). The Food Safety and Standards Authority of India consequently performs a critical function extending beyond consumer protection.

Effective food-safety regulation also possesses an economic dimension.

Testing infrastructure, reliable standards, inspection systems, certification and traceability can improve confidence in Indian food products domestically and internationally.

Food safety should therefore be treated as part of India's economic infrastructure rather than simply as a compliance burden.

7.6 Strategic Import Dependence

Self-reliance should not be confused with the elimination of international trade.

Trade can enhance food security by enabling countries to access products that may be environmentally or economically inefficient to produce domestically.

The policy concern arises when dependence becomes sufficiently concentrated to create strategic vulnerability.

Edible oils constitute an important Indian example. In 2023-24, India produced approximately 44 per cent of its domestic edible-oil requirement, while import dependence remained around 56.25 per cent (NITI Aayog, 2024).

The Government has consequently expanded measures to increase oilseed productivity and domestic edible-oil production.

Nevertheless, self-reliance should be pursued through productivity enhancement, crop suitability, efficient processing and diversification rather than indiscriminate import substitution.

7.7 Climate and Environmental Vulnerability

A food system cannot be considered self-reliant if present production is achieved by compromising the natural resources required for future production.

Climate change is expected to increase risks to Asian agriculture through temperature changes, rainfall variability, drought, floods and other extreme events (IPCC, 2022).

India must therefore simultaneously address food production and ecological resilience.

Crop diversification, efficient irrigation, improved soil health, climate-resilient varieties, precision agriculture and lower environmental stress should form part of food-security planning.

Environmental sustainability is therefore not separate from economic Independence; it is a necessary condition for its continuation.

8. Opportunities

India's food-system weaknesses simultaneously create substantial opportunities.

First, increased value addition can generate greater income from existing agricultural production without requiring proportionate expansion of land and natural-resource use.

Second, improved food-processing and storage infrastructure can generate rural non-farm employment and strengthen linkages between farmers, processors and markets.

Third, the One District One Product approach can encourage region-specific value chains and branding.

Fourth, India's agricultural diversity creates significant possibilities for differentiated products including millets, spices, fermented foods, regional products, traditional foods and GI-linked commodities.

Fifth, digital technologies offer opportunities for improving traceability, inventory management, logistics, market information and regulatory compliance.

Finally, improved quality and safety systems can strengthen India's position in international food markets.

Economic Independence therefore possesses both a resilience dimension and a competitiveness dimension.

The objective is not merely to produce domestically what India currently imports. The larger opportunity is to strengthen domestic capability to such an extent that Indian food enterprises can compete effectively in both domestic and global markets.

9. Comparative International Lessons

9.1 Brazil: Moving Beyond Calorie-Based Nutrition

Brazil provides an instructive example of nutrition-sensitive food policy.

The Dietary Guidelines for the Brazilian Population adopted an approach centred upon dietary patterns, minimally processed foods, culinary practices and the social dimensions of eating rather than merely prescribing individual nutrient targets (Ministry of Health of Brazil, 2014).

The relevance for India lies not in copying Brazil's food culture but in recognising that nutritional policy can move beyond the calculation of calorie availability.

India's food-security programmes can similarly evolve by progressively incorporating dietary diversity and regionally appropriate nutrient-rich foods.

9.2 The Netherlands: Value Addition and International Competitiveness

The Netherlands demonstrates the economic importance of agricultural technology, logistics, research and food-industry integration.

Wageningen Social & Economic Research and Statistics Netherlands estimated Dutch agricultural exports at approximately EUR 128.9 billion in 2024, illustrating the ability of a relatively small country to generate substantial agricultural trade value through efficient production, value addition and integration with European markets (Wageningen Social & Economic Research and CBS, 2025).

India's agricultural structure is fundamentally different, particularly because of the importance of small and marginal holdings.

The relevant lesson is therefore not replication of Dutch farming structures.

Rather, the Dutch experience illustrates that global agricultural competitiveness depends upon the ecosystem surrounding production: technology, infrastructure, research, logistics, processing and reliable quality standards.

9.3 South Korea: Food as Cultural and Economic Diplomacy

South Korea offers a different form of international experience.

The South Korean government has promoted the internationalisation of hansik, or Korean cuisine, through cultural-policy initiatives intended to increase the global visibility of Korean food (Jeong, 2019).

India possesses an exceptionally diverse culinary heritage, including regional cuisines, tribal foods, spices, millets, fermented products and traditional preservation practices.

Greater documentation, geographical-indication protection, branding and international promotion could enable selected Indian food traditions to function simultaneously as cultural assets and economic products.

Culinary diplomacy should not replace India's broader agricultural-export strategy, but it can complement it by creating international demand for differentiated Indian food products.

10. The Food Independence Architecture

The principal conceptual contribution of the present study is the proposed Food Independence Architecture (FIA).

The FIA interprets food self-reliance through six interconnected pillars.

Pillar I: Production Resilience

India must maintain adequate and diversified domestic production while reducing excessive dependence in strategically sensitive commodities.

Production resilience requires productivity improvement, crop diversification, technological adoption, efficient use of land and water and stronger domestic value chains.

Self-reliance does not require complete domestic production of every commodity. It requires sufficient domestic capability and diversification to prevent excessive vulnerability to external disruption.

Pillar II: Nutritional Security

Food availability cannot remain the sole measurement of success.

Agricultural and welfare policies should progressively incorporate the nutritional composition of the food basket.

Pulses, millets, fruits, vegetables and other nutrient-dense foods should receive appropriate policy attention alongside staple cereals.

The objective should be to transform the concept of food security from sufficient calories to sufficient nutrition.

Pillar III: Food Safety and Consumer Trust

A self-reliant food system must also be a trusted food system.

Food-testing infrastructure, consistent enforcement, scientifically grounded standards, improved labelling and traceability should be viewed as developmental investments.

Greater regulatory credibility can protect domestic consumers and simultaneously enhance the reputation of Indian food products internationally.

Pillar IV: Processing and Value Addition

India's food economy should progressively capture a larger portion of the value generated after agricultural production.

Cold chains, preservation facilities, processing clusters, packaging technology, branding and market linkages can enable farmers and rural enterprises to participate in higher-value segments of food markets.

Particular attention should be given to micro and small enterprises so that formalisation expands economic opportunity rather than producing exclusion through disproportionate compliance costs.

Pillar V: Sustainability and Climate Resilience

Food-system development must remain ecologically viable.

Climate adaptation, water efficiency, soil restoration, crop diversification and sustainable input management should be integrated with agricultural productivity programmes.

Economic Sustainability achieved through environmentally unsustainable production would merely transfer present economic vulnerability into future ecological vulnerability.

Pillar VI: Global Competitiveness

Economic Self Reliance should ultimately strengthen India's ability to participate in international food markets rather than encourage withdrawal from them.

Global competitiveness requires more than agricultural surpluses.

It depends upon predictable quality, food safety, certification, traceability, efficient logistics, branding and compliance with importing-country standards.

The final stage of self-reliant food-system should therefore be the transition from domestic resilience to internationally credible food leadership.

11. Legal and Policy Implications

The first policy requirement arising from the Food Independence Architecture is greater institutional convergence.

India already operates extensive programmes relating to agriculture, nutrition, food processing, food safety, commerce and environmental sustainability. The policy challenge is therefore not simply the creation of additional schemes.

Greater coordination is required between existing schemes and institutions.

Second, nutrition should be more closely connected with agricultural policy. Crop incentives, procurement and public-food programmes can increasingly consider nutritional outcomes alongside production objectives.

Third, food safety must be recognised as part of economic policy. Strengthening laboratories, quality-control systems, testing, traceability and enforcement would generate both public-health and commercial benefits.

Fourth, compliance support should be expanded for small farmers, FPOs and micro food enterprises. Regulatory simplification should not mean dilution of safety standards; instead, government should reduce avoidable procedural complexity while helping smaller participants achieve substantive compliance.

Fifth, policy evaluation should increasingly be based upon measurable outcomes rather than only expenditure and infrastructure creation.

Indicators might include reduction in commodity-specific post-harvest losses, improvements in processing capacity, changes in nutritional outcomes, reduced dependence in strategically sensitive commodities, improvements in farmer value realisation and enhanced compliance with domestic and international quality standards.

Finally, traditional and indigenous food knowledge should be treated as an economic as well as cultural resource. Universities, food institutions, tribal organisations and state governments can collaborate in documenting regional foods, traditional preservation methods and indigenous crops.

12. Discussion

The evidence considered in this study demonstrates that India's contemporary food challenge is no longer simply a question of production.

India possesses substantial agricultural output, diverse agro-climatic conditions, scientific institutions, an expanding food-processing sector and an enormous domestic consumer market.

Yet production strength coexists with nutritional deficiencies, import dependence in strategically important commodities, post-harvest inefficiencies, public-health challenges, climate risks and uneven value addition.

This apparent contradiction arises because food systems are interconnected.

Increasing agricultural production without processing or storage may create limited additional value.

Expanding processing without adequate food-safety and nutritional regulation may generate public-health costs.

Reducing imports without improving domestic productivity can impose higher costs upon consumers.

Increasing exports without ensuring quality and traceability can create regulatory and reputational risks.

Economic Self Reliance should therefore be interpreted primarily as a domestic capability-building strategy.

Its objective should not be isolation from global trade but reduction of avoidable vulnerability and development of the institutional and economic capabilities required to participate competitively in international markets.

The Food Independence Architecture proposed in this paper reflects this broader interpretation.

13. Research Limitations and Scope for Future Research

The study is principally doctrinal, conceptual and policy-oriented.

It relies upon official statistics, government reports and secondary literature and does not estimate causal relationships between particular policies and food-system outcomes.

The national-level approach also conceals substantial differences between Indian states in agricultural structure, irrigation, dietary patterns, infrastructure, processing capacity and regulatory implementation.

Future research could therefore conduct a state-level panel analysis examining relationships between cold-chain infrastructure, processing capacity and farmer income.

Empirical research could also analyse relationships between household income, food prices and dietary diversity or examine whether investment in food-quality infrastructure is associated with improved export performance.

Similarly, firm-level surveys could investigate the compliance costs faced by micro and small food-processing enterprises.

Such econometric and primary empirical research would complement the present study. However, it is not necessary for answering the principal conceptual and regulatory questions addressed here.

14. Conclusion

India's transformation from chronic food scarcity to large-scale agricultural production constitutes one of the country's most significant developmental achievements.

Yet the success of the earlier food-security paradigm has also changed the nature of the problem India must now address.

The contemporary challenge is not simply to produce more food.

It is to ensure that India's food system can simultaneously deliver nutrition, food safety, farmer prosperity, economic value, environmental sustainability and resilience against external shocks.

Economic self-reliance provides an appropriate framework for reconsidering these objectives, provided that self-reliance is understood as capability rather than isolation.

India does not need to eliminate food trade or manufacture every agricultural input domestically. Instead, it must identify strategic vulnerabilities, build efficient domestic capacity and ensure that international dependence does not become a source of systemic insecurity.

The proposed Food Independence Architecture consequently integrates six dimensions: production resilience, nutritional security, food safety, processing and value addition, environmental sustainability and global competitiveness.

None can operate effectively in isolation.

Production without nutrition is incomplete food security. Processing without safety is unsustainable development. Agricultural growth without ecological resilience undermines future production. Self-reliance without competitiveness risks inefficiency, while global competitiveness without strong domestic capabilities increases vulnerability.

India possesses the agricultural diversity, cultural heritage, technological capability, institutional infrastructure and market scale necessary to move towards a stronger position within the global food economy.

The next stage of economic independence and sustainability should therefore seek not merely an India that can feed itself, but an India capable of producing food that is nutritious, safe, sustainable, economically valuable and globally trusted.

The transition from food sufficiency to sustainable food leadership should consequently become a central objective of India's evolving food-system strategy.

References

Food Safety and Standards Authority of India (FSSAI) (2025) Annual Report 2024-25. New Delhi: Food Safety and Standards Authority of India.

Government of India (2006) The Food Safety and Standards Act, 2006. New Delhi: Government of India.

Government of India (2013) The National Food Security Act, 2013. New Delhi: Government of India.

Government of India (2020) 'PM's Address to the Nation on 12 May 2020'. New Delhi: Prime Minister's Office.

Government of India, Ministry of Finance (2025) Economic Survey 2024-25. New Delhi: Government of India.

International Institute for Population Sciences (IIPS) and ICF (2021) National Family Health Survey (NFHS-5), 2019-21: India. Mumbai: IIPS.

Intergovernmental Panel on Climate Change (IPCC) (2022) Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press. doi:10.1017/9781009325844.

Jeong, J. (2019) 'Taste of Korea: Governmental discourse on national cuisine and its articulation of nation-ness', Ewha Journal of Social Sciences, 35(1), pp. 153-186. doi:10.16935/ejss.2019.35.1.005.

Ministry of Agriculture and Farmers Welfare (2026) 'Agriculture and Allied Sector GVA More Than Doubles to Rs 48.77 Lakh Crore in 2023-24; Foodgrain Production Continues to Rise'. New Delhi: Government of India.

Ministry of Food Processing Industries (MoFPI) (2023) Pradhan Mantri Kisan SAMPADA Yojana. New Delhi: Government of India.

Ministry of Food Processing Industries (MoFPI) (2025a) 'NABCONS Study Assesses Post-Harvest Losses Across 54 Crops During 2020-22'. New Delhi: Government of India.

Ministry of Food Processing Industries (MoFPI) (2025b) Annual Report 2024-25. New Delhi: Government of India.

Ministry of Food Processing Industries (MoFPI) (2026) 'Small Food Processing Units under PMFME: Empowering Micro Food Entrepreneurs through PMFME'. New Delhi: Government of India.

Ministry of Health of Brazil (2014) Dietary Guidelines for the Brazilian Population. 2nd edn. Brasilia: Ministry of Health.

Ministry of Statistics and Programme Implementation (MoSPI) (2026) Annual Report, Periodic Labour Force Survey 2025. New Delhi: Government of India.

Ministry of Women and Child Development (2022) Mission Saksham Anganwadi and POSHAN 2.0: Scheme Guidelines. New Delhi: Government of India.

Monteiro, C.A., Cannon, G., Levy, R.B., Moubarac, J.C., Louzada, M.L.C., Rauber, F., Khandpur, N., Cediel, G., Neri, D., Martinez-Steele, E., Baraldi, L.G. and Jaime, P.C. (2019) 'Ultra-processed foods: What they are and how to identify them', Public Health Nutrition, 22(5), pp. 936-941. doi:10.1017/S1368980018003762.

NITI Aayog (2024) Pathways and Strategy for Accelerating Growth in Edible Oil towards the Goal of Atmanirbharta. New Delhi: Government of India.

Wageningen Social & Economic Research and Statistics Netherlands (CBS) (2025) Strong Growth in Dutch Agricultural Exports Driven by European Trade. Wageningen: Wageningen University & Research.

World Health Organization (WHO) (2023) The Growth of Ultra-Processed Foods in India: An Analysis of Trends, Issues and Policy Recommendations. New Delhi: WHO Country Office for India. ISBN 978-92-9021-067-2.

World Health Organization (WHO) (2026) Healthy Diet. Geneva: World Health Organization.