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Digital Exclusion, Aadhaar Authentication and the Right to Food: A Socio-Legal Evaluation of the National Food Security Act, 2013 in India

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ABSTRACT

Food security is indispensable to human dignity, social justice, and sustainable development. India enacted the National Food Security Act, 2013 (NFSA) to provide protection against hunger and malnutrition, transforming existing food welfare schemes into legally enforceable entitlements for eligible households and guaranteeing access to subsidised food grains and nutritional support through a rights-based legal framework. The implementation of the Act has increasingly relied on digital technologies, particularly Aadhaar-based biometric authentication, to enhance transparency, eliminate duplicate beneficiaries, and reduce leakages in the Public Distribution System (PDS). While these interventions have improved the administrative efficiency of monitoring and distribution, they have also generated concerns regarding exclusion from food entitlements arising from authentication failures, connectivity problems, technological glitches, and digital illiteracy. This paper examines the implications of Aadhaar-enabled food distribution systems for the constitutional right to food in India through available literature and data. It critically analyses the legal, policy, and constitutional framework on food security, evaluates the role of digital authentication in welfare delivery, and assesses the challenges arising from digital exclusion. The paper argues that although technological developments have improved governance, excessive dependence on digital mechanisms may undermine access to food for vulnerable populations. It advocates a balanced approach that combines technological efficiency with constitutional commitments to social justice, human dignity, and welfare rights, and concludes that inclusive legal safeguards and alternative verification mechanisms are essential to ensure that digital governance strengthens rather than weakens the objectives of the National Food Security Act, 2013.

Keywords: Food Security, National Food Security Act, Aadhaar, Digital Exclusion, Right to Food, Public Distribution System, Welfare Governance, Human Rights.

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I. INTRODUCTION

Food is one of the most basic requirements for human existence and forms the foundation of a healthy and productive life. Access to adequate food is not merely a matter of survival but also a prerequisite for the enjoyment of other fundamental rights.¹ A society cannot achieve social justice, economic development, or human dignity if a significant portion of its population continues to suffer from hunger and malnutrition. Food security has consequently emerged as one of the most important concerns of modern welfare states.

Globally, the problem of food security has received considerable attention from governments and international organisations. The concept of food security extends beyond the mere availability of food and encompasses accessibility, affordability, nutritional adequacy, and sustainability.² Food security exists only when all individuals have access to sufficient, safe, and nutritious food that meets their dietary requirements for an active and healthy life. Despite various advancements in production technology, millions of people continue to experience difficulties in obtaining food owing to poverty, inequality, unemployment, and social exclusion.³

India is among the largest producers of food grains in the world, yet a considerable portion of its population continues to face challenges relating to hunger and malnutrition.⁴ Regional inequalities, population growth, and inefficiencies in food distribution mechanisms have historically contributed to food insecurity.⁵ To address these issues, successive governments have introduced various welfare programmes and schemes to ensure the availability and accessibility of food among vulnerable populations. These initiatives have included the Public Distribution System (PDS), the Mid-Day Meal Scheme, the Integrated Child Development Services (ICDS), the Atmanirbhar Bharat scheme, the Pradhan Mantri Garib Kalyan Yojana, and several targeted poverty alleviation schemes.⁶

¹ Mathilde Cohen, *The Right to Food*, ResearchGate (2020), https://www.researchgate.net/publication/343079676_The_Right_to_Food (last visited July 11, 2026).

² Davide Marino et al., *Measuring Local Poverty and Food Insecurity: Developing an Affordability Index for Healthy Diets*, 17 REGIONAL SCI. POL'Y & PRAC. 100244 (2025), <https://www.sciencedirect.com/science/article/pii/S1757780225000745>.

³ Preetmoninder Lidder, Andrea Cattaneo & Mona Chaya, *Innovation and Technology for Achieving Resilient and Inclusive Rural Transformation*, 44 GLOBAL FOOD SEC. 100827 (2025), <https://www.sciencedirect.com/science/article/pii/S2211912425000021>.

⁴ ASHOK GULATI ET AL., *FOOD SYSTEMS IN INDIA: CHALLENGES, PERFORMANCE AND PROMISE* 813 (2023).

⁵ Atif Awad, *The Determinants of Food Insecurity Among Developing Countries: Are There Any Differences?*, 19 SCIENTIFIC AFR. (2023).

⁶ MINISTRY OF CONSUMER AFFAIRS, FOOD & PUB. DISTRIBUTION, GOV'T OF INDIA, PRADHAN MANTRI GARIB KALYAN ANNA YOJANA (PMGKAY), <https://dfpd.gov.in/pradhan-mantri-garib-kalyan-anna-yojana/en> (last visited 2025).

Although these initiatives worked significantly to curb hunger, gaps remained in relation to leakages, corruption, identification of eligible households, and distribution inefficiencies.⁷ Since there was no comprehensive legal framework governing food rights, welfare programmes proved less effective than intended. There consequently emerged a need for a rights-based approach to food security capable of transforming welfare schemes into a legally enforceable mechanism.⁸

The National Food Security Act, 2013 represented an important development in Indian welfare jurisprudence. The legislation sought to provide statutory recognition to food security by guaranteeing subsidised food grains to eligible households and nutritional support to women and children. By converting welfare schemes into legal entitlements, the Act reflected the constitutional commitment to social justice and human dignity.⁹ The legislation also reinforced the state's obligation to ensure food security for vulnerable populations and to reduce the prevalence of hunger and malnutrition.

Alongside these developments, India experienced a rapid technological transformation in public administration. The Digital India initiative encouraged the use of technology to improve the distribution process, increase transparency, and enhance service delivery.¹⁰ Aadhaar, a biometric-based unique identification system, became a central component of this transformation.¹¹ Aadhaar was introduced with the objective of providing a unique identity to residents and facilitating the efficient delivery of welfare benefits.¹²

Over time, Aadhaar-based authentication was integrated into numerous welfare programmes, including the Public Distribution System. Beneficiaries were required to authenticate their identities through biometric verification before receiving food grains and other benefits. The introduction of electronic Point of Sale (e-POS) devices at fair-price shops was intended to reduce fraud, eliminate duplicate beneficiaries, and improve the monitoring of food distribution.¹³

⁷ Ritu Makhija & Niyati Padhi, *A Chronological Survey of the Effectiveness of Public Distribution System in India: Challenges Ahead*, INT'L J. ENV'T SCI. 1350 (2025).

⁸ Raghvendra Kumar Yadav, *Right to Food in India with Special Reference to National Food Security Act, 2013: A Socio-Legal Study*, 1 NAVEEN INT'L J. MULTIDISCIPLINARY SCI. (2025).

⁹ FOOD & AGRIC. ORG. OF THE U.N., *The Right to Food Around the Globe: India*, <https://www.fao.org/right-to-food-around-the-globe/countries/ind/en/> (last visited June 9, 2026).

¹⁰ Stavros Sindakis & Gazal Showkat, *The Digital Revolution in India: Bridging the Gap in Rural Technology Adoption*, 13 J. INNOVATION & ENTREPRENEURSHIP 1 (2024), <https://innovation-entrepreneurship.springeropen.com/articles/10.1186/s13731-024-00380-w>.

¹¹ Arthi MC & Kavitha Shanmugam, *Implementing Unique Identification Technology: The Journey and Success Story of Aadhaar in India*, J. INFO. TECH. TEACHING CASES (2023).

¹² *Id.*

¹³ Cristian Dumitrescu, *Digitalization of Public Administration in Romania: The Way Towards Efficiency and Accessibility*, 13 PERSPS. L. & PUB. ADMIN. 167 (2024).

The integration of unique identification into welfare governance was widely welcomed as a means of strengthening accountability and transparency. Supporters argued that biometric authentication would prevent the diversion of food grains, reduce corruption, and ensure that benefits reached eligible households.¹⁴ The government also emphasised that digitisation would create a more efficient and responsive welfare system.

However, the increasing reliance on digital technologies, coupled with a limited legal and policy framework, has generated significant gaps. Available literature shows that beneficiaries were denied access to food entitlements owing to biometric authentication failures, internet connectivity problems, limited technical knowledge, errors, and inaccuracies in beneficiary databases.¹⁵ These challenges have disproportionately affected marginalised households, including elderly persons, persons with disabilities, migrants, members of tribal communities, and individuals residing in rural areas.

Digital exclusion also raises important questions regarding the compatibility of technological governance with the constitutional principles of life, equality, dignity, and social justice.¹⁶ While technology may enhance administrative efficiency, it should not become a barrier to the realisation of fundamental rights. If access to food becomes overly dependent on technological systems that are susceptible to errors and failures, the objectives of the National Food Security Act may be undermined.

The issue becomes even more significant when viewed in the context of the constitutional right to life under Article 21 of the Constitution of India.¹⁷ Judicial interpretation has continuously expanded the scope of Article 21 to include the right to live with dignity, which encompasses access to adequate food, shelter, healthcare, and other basic necessities of life.¹⁸ Consequently, any governance mechanism that restricts access to food entitlements may have serious constitutional implications.

The emerging debate on Aadhaar-enabled food distribution reflects a broader tension between technological effectiveness and social inclusion. Given the manner in which governments are

¹⁴ Sharath Chandra Thurupati, *The Evolution of Identity and Access Management: Integrating Biometric and Behavioral Authentication*, 6 INT'L J. MULTIDISCIPLINARY RSCH. (2024).

¹⁵ Nikita Nagaraj & Amit Prakash, *Digital Biometric Authentication and Citizens' Right to Food: Neglect of the "Local" in India's Aadhaar-Enabled Public Distribution System* (2021).

¹⁶ Prashant Kumar Chauhan, *Internet Access as a Human Right in India: Bridging the Digital Divide in a Technological Democracy*, ResearchGate (2025), <https://www.researchgate.net/publication/397746637> (last visited July 12, 2026).

¹⁷ INDIA CONST. art. 21.

¹⁸ Shreyansh Singh, *Right to Live with Dignity: A Critical Analysis*, 2 INT'L J. LEGAL RSCH. & ANALYSIS (2023), <https://www.ijlra.com/details/right-to-live-with-dignity-critical-analysis-by-shreyansh-singh> (last visited May 16, 2026).

increasing their reliance on new technologies to improve public administration and governance, it is essential to ensure that these innovations do not give rise to new forms of exclusion. The challenge lies in striking a balance between efficiency and accessibility, ensuring that technological interventions complement rather than compromise welfare objectives.

Against this backdrop, this paper undertakes a socio-legal evaluation of Aadhaar authentication and digital exclusion in the implementation of the National Food Security Act, 2013. It examines the legal philosophy of the right to food, evaluates the effectiveness of Aadhaar-based authentication, and assesses its impact on access to food. It further explores the constitutional, social, and policy dimensions of digital exclusion and proposes measures for ensuring inclusive food security governance.

A. Knowledge gap

The implementation of Aadhaar-based authentication in welfare programmes has generated extensive academic and policy discussion. Existing literature largely focuses on administrative efficiency, the reduction of leakages, and technological innovation in welfare governance. Several studies highlight the benefits of digitisation in improving transparency and targeting beneficiaries. However, relatively limited attention has been paid to the impact of digital authentication on the realisation of the right to food from a constitutional and socio-legal perspective.

Most existing studies examine food security and digital governance as separate areas of inquiry. There remains a significant gap in understanding how technological barriers affect access to food entitlements among vulnerable populations. Furthermore, limited scholarship comprehensively evaluates whether digital authentication mechanisms are consistent with the rights-based framework embodied in the National Food Security Act, 2013.

In order to address this gap, this paper combines legal analysis with an examination of contemporary challenges in welfare governance in the digital age. It interrogates the links between Aadhaar authentication, digital exclusion, and the fundamental right to food, and situates itself within emerging debates on technology, welfare, and social justice.

B. Research objectives

This paper seeks to achieve the following objectives: first, to examine the legal and constitutional framework governing the right to food under the National Food Security Act, 2013 in India; second, to critically analyse the role of Aadhaar-based biometric authentication in the implementation of the National Food Security Act, 2013 and its impact on access to food entitlements; and third, to evaluate the challenges of digital exclusion in food security

governance and to suggest legal and policy reforms for ensuring inclusive access to food entitlements.

C. Hypotheses

This paper is based on the following hypotheses. First, the National Food Security Act, 2013 has significantly strengthened the realisation of the right to food by providing statutory food entitlements to vulnerable sections of society. Second, Aadhaar-based authentication has improved transparency and administrative efficiency but has also contributed to the exclusion of certain beneficiaries owing to technological barriers. Third, the adoption of inclusive legal safeguards and alternative authentication mechanisms can reduce digital exclusion and improve the effective implementation of the National Food Security Act, 2013.

D. Research methodology

This paper adopts a doctrinal and socio-legal research methodology. The research is descriptive, analytical, and evaluative in nature. It relies upon both primary and secondary sources. Primary sources include constitutional provisions, statutory enactments relating to food security and Aadhaar, policy documents, government notifications, and judicial decisions. Secondary sources include books, research articles, scholarly journals, reports, dissertations, and academic commentaries dealing with food security, welfare governance, constitutional rights, and digital administration.

In relation to the first objective, doctrinal analysis has been undertaken to examine the constitutional and legal framework governing the right to food and the National Food Security Act, 2013. In relation to the second objective, an analytical examination of Aadhaar-based authentication mechanisms and digital governance initiatives has been carried out to assess their role in food security implementation. In relation to the third objective, a socio-legal evaluation of digital exclusion, implementation challenges, and policy responses has been conducted to identify gaps and propose reforms for inclusive welfare governance. The study adopts a qualitative approach and seeks to understand the interaction between law, technology, and social realities in the context of food security administration in India.

II. FOOD SECURITY AND THE RIGHT TO FOOD

Food security is a complex and multifaceted phenomenon that extends beyond the question of food availability. It includes the ability of individuals to obtain sufficient, nutritious, and safe

food to lead a healthy and active life.¹⁹ Its meaning has evolved from a partial understanding focused only on food production to a broader conception encompassing economic access, nutritional adequacy, and sustainability.

Food security is generally understood as a situation in which all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life.²⁰ This definition emphasises not only the quantity of food available but also its quality and accessibility.

This conception is especially important in developing countries, where conditions such as poverty, unemployment, social inequality, and regional disparity hamper access to food.²¹ Food security is thus intimately connected with larger issues of economic development, social justice, and human rights.

A. Dimensions of food security

Food availability refers to the physical sufficiency and adequacy of nutrition within a nation or region; it depends upon agricultural production, imports, distribution, and food stocks.²² Even where the production of food grains within a country is ample, food security cannot result if such food does not reach the poor and the needy.

Accessibility refers to the ability of individuals and households to obtain food. Access may be affected by income levels, purchasing power, geographical location, and social factors.²³ Economic inequalities often prevent vulnerable populations from obtaining adequate food even when food is available in markets.

Food utilisation concerns the nutritional value of food and its absorption by the body. The quality of food utilisation is affected by access to drinking water, sanitation facilities, healthcare services, and awareness of nutrition.²⁴

¹⁹ WORLD BANK GRP., *What Is Food Security?*, World Bank (2025), <https://www.worldbank.org/en/topic/agriculture/brief/food-security-update/what-is-food-security>.

²⁰ Mark Gibson, *Food Security—A Commentary: What Is It and Why Is It So Complicated?*, 1 FOODS 18 (2012), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5302220/> (last visited May 5, 2026).

²¹ Mireya Vilar-Compte et al., *Urban Poverty and Nutrition Challenges Associated with Accessibility to a Healthy Diet: A Global Systematic Literature Review*, 20 INT'L J. EQUITY HEALTH (2021), <https://equityhealthj.biomedcentral.com/articles/10.1186/s12939-020-01330-0>.

²² M.S. Swaminathan & R.V. Bhavani, *Food Production & Availability: Essential Prerequisites for Sustainable Food Security*, 138 INDIAN J. MED. RSCH. 383 (2013), <https://pmc.ncbi.nlm.nih.gov/articles/PMC3818607/> (last visited May 7, 2026).

²³ Donald Rose, *Access to Healthy Food: A Key Focus for Research on Domestic Food Insecurity*, 140 J. NUTRITION 1167 (2010), <https://pmc.ncbi.nlm.nih.gov/articles/PMC2869501/> (last visited May 10, 2026).

²⁴ Abiodun Olusola Omotayo, Bukola Rhoda Aremu & Oluwadara Pelumi Alamu, *Food Utilization, Nutrition, Health and Farming Households' Income: A Critical Review of Literature*, 56 J. HUM. ECOLOGY 171 (2016), <https://www.researchgate.net/publication/311320986> (last visited May 10, 2026).

Stability refers to access to food at all times. Food insecurity may be caused by natural disasters, economic crises, inflation, conflict, pandemics, or supply chain disruptions. Stable and consistent access to food sources is essential for long-term food security.²⁵

B. Human dignity and food security

There is a direct relationship between food and human dignity. The deprivation of food not only affects an individual physically but also severely impairs the ability to live with dignity, to contribute meaningfully to economic activity, and to engage in political processes.²⁶ The deprivation of sufficient food is often accompanied by social exclusion, marginalisation, and poverty.

Human dignity forms the foundation of modern human rights jurisprudence.²⁷ A person deprived of food can hardly exercise the rights to education, employment, care, or political participation.²⁸ Access to food is therefore increasingly regarded as fundamental to the achievement of human dignity.

The recognition of food as a component of human dignity has shaped constitutional jurisprudence and welfare policies across jurisdictions.²⁹ This recognition entails not only that governments must refrain from depriving people of food but also that they must positively secure food for the most vulnerable sections of society.

C. The right to food as a human right

The right to food has become an internationally recognised human right.³⁰ It proceeds from the principle that every person is entitled to the food required for sound physical and mental health. The right to food is far more than protection against starvation; it includes the availability of nutritious, culturally adequate, and sustainable sources of food.

²⁵ Ernest Tambo et al., *Triple-Crises-Induced Food Insecurity: Systematic Understanding and Resilience Building Approaches in Africa*, 2 SCI. ONE HEALTH 100044 (2023), <https://www.sciencedirect.com/science/article/pii/S2949704323000380> (last visited May 11, 2026).

²⁶ *Francis Coralie Mullin v. Adm'r, Union Territory of Delhi*, (1981) 1 S.C.C. 608, 618 (India); *Maneka Gandhi v. Union of India*, (1978) 1 S.C.C. 248, 281 (India).

²⁷ Paolo Carozza, *Human Dignity and the Foundations of Human Rights* (2020), <https://www.heritage.org/sites/default/files/2020-12/SR239.pdf> (last visited May 12, 2026).

²⁸ Aparna Katre & Brianna Raddatz, *Low-Income Families' Direct Participation in Food-Systems Innovation to Promote Healthy Food Behaviors*, 15 NUTRIENTS 1271 (2023), <https://pmc.ncbi.nlm.nih.gov/articles/PMC10005603/> (last visited June 6, 2026).

²⁹ OFF. OF THE U.N. HIGH COMM'R FOR HUM. RTS., *About the Right to Food and Human Rights* (2024), <https://www.ohchr.org/en/special-procedures/sr-food/about-right-food-and-human-rights> (last visited June 6, 2026).

³⁰ FED. MINISTRY OF FOOD & AGRIC., *The Human Right to Food*, <https://www.bmlh.de/SharedDocs/Downloads/EN/Publications/the-human-right-to-food.pdf> (last visited June 6, 2026).

The human rights approach to food security places legal obligations upon governments to respect, protect, and fulfil the right to food.³¹ The obligation to respect requires governments to refrain from actions that interfere with access to food. The obligation to protect requires states to prevent third parties from depriving individuals of food resources.³² The obligation to fulfil requires governments to establish policies and programmes that facilitate access to food for vulnerable populations.³³ This rights-based perspective has influenced the development of food security legislation in many countries, including India.

D. Food security and sustainable development

Food security is closely connected with sustainable development. Hunger and malnutrition hinder economic growth, reduce productivity, and perpetuate cycles of poverty. Conversely, food security contributes to social stability, public health, and economic progress.

The Sustainable Development Goals adopted by the international community emphasise the importance of eliminating hunger and ensuring food security. Sustainable Development Goal 2 seeks to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture.³⁴ India's food security framework, particularly the National Food Security Act, 2013, reflects the broader objective of achieving sustainable and inclusive development by ensuring access to food for vulnerable populations.

III. INTERNATIONAL LEGAL FRAMEWORK ON THE RIGHT TO FOOD

A. Universal Declaration of Human Rights, 1948

The recognition of food as a fundamental human right can be traced to the Universal Declaration of Human Rights, 1948. Article 25 of the Declaration recognises the right of every individual to an adequate standard of living, including food, clothing, housing, medical care, and social services.³⁵ Although the Universal Declaration is not legally binding, it serves as the foundation of international human rights law and has significantly influenced national constitutions and legislation concerning socio-economic rights.

³¹ FOOD & AGRIC. ORG. OF THE U.N., *The Right to Food*, <https://www.fao.org/right-to-food/en> (last visited June 10, 2026).

³² THE LAW INST., *The Fundamental Human Right to Food: An Overview* (2023), <https://thelaw.institute/human-rights-evolution-concepts-and-concerns/human-right-to-food-overview/> (last visited June 10, 2026).

³³ *Id.*

³⁴ UNITED NATIONS, *Goal 2: Zero Hunger*, U.N. Sustainable Development (2025), <https://www.un.org/sustainabledevelopment/hunger/> (last visited June 10, 2026).

³⁵ Universal Declaration of Human Rights art. 25, G.A. Res. 217A (III), U.N. Doc. A/810 (Dec. 10, 1948).

B. International Covenant on Economic, Social and Cultural Rights, 1966

The International Covenant on Economic, Social and Cultural Rights (ICESCR) provides the most comprehensive recognition of the right to food. Article 11 acknowledges the right of every person to an adequate standard of living, including adequate food, and recognises the fundamental right to be free from hunger.³⁶ The Covenant requires state parties to take appropriate measures to improve food production, ensure the equitable distribution of food resources, and eliminate hunger. India, being a party to the ICESCR, has an international obligation to progressively realise the right to food.

C. Convention on the Rights of the Child, 1989

The Convention on the Rights of the Child emphasises the importance of adequate nutrition for children's development and well-being.³⁷ It obliges states to combat disease and malnutrition through the provision of nutritious food and access to healthcare services. The Convention has influenced India's policies relating to child nutrition, including schemes such as the Mid-Day Meal Programme and the Integrated Child Development Services.

D. Convention on the Elimination of All Forms of Discrimination Against Women, 1979

This Convention recognises the nutritional needs of women, particularly during pregnancy and lactation. It requires states to ensure adequate nutrition and healthcare for women and children.³⁸ The maternity benefits and nutritional support provisions under the National Food Security Act reflect these international commitments.

IV. THE CONSTITUTIONAL FRAMEWORK OF THE RIGHT TO FOOD IN INDIA

The Constitution of India provides a basic, welfare-oriented framework aimed at establishing a social order founded on justice and the reduction of inequalities. The Preamble obliges the state to secure justice, liberty, equality, and dignity for all citizens.³⁹ Although the Constitution contains no express right to food, a number of provisions address food security and social welfare and support a national programme grounded in human rights. Article 21 provides that no person shall be deprived of life or personal liberty except according to the procedure established by law.⁴⁰ This provision has given rise to a long line of judicial interpretation expanding its scope. The Supreme Court has consistently held that the right to life includes the

³⁶ International Covenant on Economic, Social and Cultural Rights art. 11, Dec. 16, 1966, 993 U.N.T.S. 3.

³⁷ UNITED NATIONS CHILDREN'S FUND, *Convention on the Rights of the Child* (2025), <https://www.unicef.org/child-rights-convention> (last visited June 5, 2026).

³⁸ Convention on the Elimination of All Forms of Discrimination Against Women, Dec. 18, 1979, 1249 U.N.T.S. 13.

³⁹ INDIA CONST. pmbi.

⁴⁰ INDIA CONST. art. 21.

right to live with dignity, and that the dignity of a person presupposes access to goods that are too often taken for granted, including food, shelter, healthcare, and education. The constitutional recognition of food as an essential component of life has played a crucial role in shaping India's food security jurisprudence.

A. Directive Principles of State Policy

The Directive Principles of State Policy provide important guidance regarding the state's responsibility towards food security. Article 38 directs the state to strive towards securing an adequate social order, minimising economic inequality, and ensuring the dignity of every individual.⁴¹ Article 39 provides that the state shall, in particular, direct its policy towards securing that the material resources of the community are so distributed as to subserve the common good and are not concentrated.⁴² Article 41 requires the state to make effective provision for public assistance in cases of unemployment, old age, sickness, and similar circumstances.⁴³ Article 47 specifically requires the state to take steps to improve nutrition, raise the standard of living, and improve public health.⁴⁴ These provisions form the constitutional foundation of food security policy in India.

B. Judicial recognition of the right to food

The right to food has been reinforced by the Indian courts over time. Judicial activism has transformed socio-economic rights from non-justiciable claims into constitutional guarantees.⁴⁵ The courts have repeatedly held that the right to life necessarily implies a right to sufficient food and nutrition. Judicial pronouncements in various cases have effectively compelled governments to implement welfare programmes more comprehensively and to ensure that no vulnerable section of the population is excluded from basic means of sustenance.⁴⁶ The recognition of food as an integral component of human dignity and of constitutional rights ultimately contributed to the enactment of the National Food Security Act, 2013.

V. THE NATIONAL FOOD SECURITY ACT, 2013: A LEGAL ANALYSIS

The National Food Security Act, 2013 was enacted with the objective of providing food and

⁴¹ INDIA CONST. art. 38.

⁴² INDIA CONST. art. 39.

⁴³ INDIA CONST. art. 41.

⁴⁴ INDIA CONST. art. 47.

⁴⁵ THE LAW INST., *The Landmark Right to Food Case in India: A Legal Milestone* (2025), <https://thelaw.institute/rural-local-self-governance/right-to-food-case-legal-milestone-india/> (last visited June 10, 2026).

⁴⁶ *Id.*

nutritional security to eligible households through a rights-based approach.⁴⁷ The legislation emerged from a growing recognition that food security should be treated as a legal right rather than a discretionary welfare measure. The Act constitutes one of the world's largest food security programmes and seeks to ensure access to affordable food for a substantial proportion of India's population.⁴⁸

The objectives of the Act include ensuring food security for vulnerable populations and reducing hunger and malnutrition.⁴⁹ The Act also provides legal entitlements to subsidised food grains, strengthens nutritional support for women and children, and promotes transparency and accountability in the food distribution process.⁵⁰

The Act covers approximately two-thirds of India's population through the Targeted Public Distribution System, and eligible households are entitled to receive food grains at highly subsidised rates.⁵¹ Household identification for coverage under the Act is undertaken by state governments in accordance with the eligibility criteria prescribed by law.

Eligible households are entitled to receive specified quantities of food grains at subsidised prices.⁵² These entitlements seek to ensure minimum nutritional support and to protect vulnerable populations from food insecurity.⁵³ The subsidy mechanism plays a crucial role in making food affordable for economically weaker sections of society.

The Act places special emphasis on women and children.⁵⁴ It provides nutritional support during pregnancy, lactation, and childhood through various welfare programmes.⁵⁵ The legislation recognises that women and children are particularly vulnerable to malnutrition and therefore require targeted interventions.

Pregnant and lactating women are entitled to maternity benefits under the Act. These provisions aim to improve maternal health and reduce nutritional deficiencies among mothers and infants.⁵⁶ The inclusion of maternity benefits reflects the broader objective of promoting food security across different stages of life.

⁴⁷ The National Food Security Act, 2013, No. 20, Acts of Parliament, 2013 (India); see also NAT'L FOOD SEC. PORTAL, <https://nfsa.gov.in/portal/NFSA-Act> (last visited June 9, 2026).

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² The National Food Security Act, 2013, No. 20, Acts of Parliament, 2013, sched. IV (India).

⁵³ The National Food Security Act, 2013, No. 20, Acts of Parliament, 2013, § 4 (India).

⁵⁴ The National Food Security Act, 2013, No. 20, Acts of Parliament, 2013, §§ 4–5 (India).

⁵⁵ *Id.*

⁵⁶ *Id.*

The Act incorporates several measures to enhance transparency and accountability in food distribution.⁵⁷ These include social audits, grievance redressal mechanisms, disclosure requirements, and monitoring systems. Such provisions seek to minimise corruption, improve efficiency, and strengthen public confidence in food security programmes. The National Food Security Act represents a transformative development in India's welfare framework. It converts food assistance programmes into legal entitlements and strengthens the state's commitment to social justice. The Act reflects the constitutional values of dignity, equality, and welfare while providing a legislative foundation for realising the right to food. However, the effectiveness of the Act increasingly depends upon its implementation mechanisms, particularly digital authentication systems, which are examined in the sections that follow.

VI. AADHAAR AUTHENTICATION AND DIGITAL GOVERNANCE IN FOOD SECURITY ADMINISTRATION

The twenty-first century has witnessed an increasing reliance on digital technologies in public administration.⁵⁸ Governments across the world have adopted technological innovations to improve efficiency, transparency, accountability, and accessibility in service delivery.⁵⁹ India has likewise embraced digital governance as a means of modernising administrative processes and enhancing the effectiveness of welfare programmes.⁶⁰

The Digital India initiative launched by the Government of India aimed to transform governance through the use of information and communication technologies.⁶¹ The initiative sought to improve public service delivery, reduce administrative delays, strengthen transparency, and ensure the efficient utilisation of public resources. Within this framework, digital identification systems became a crucial component of welfare governance.

Aadhaar emerged as one of the most significant digital governance initiatives undertaken in India. The system provides a unique identification number linked to the biometric and

⁵⁷ The National Food Security Act, 2013, No. 20, Acts of Parliament, 2013, ch. XI (India).

⁵⁸ Ion Popa et al., *Integrating Digitalization Opportunities into Innovative Public Organizations' Management Process*, 9 J. INNOVATION & KNOWLEDGE 100564 (2024), <https://www.sciencedirect.com/science/article/pii/S2444569X24001033> (last visited May 11, 2026).

⁵⁹ Abhinandan Kulal et al., *Enhancing Public Service Delivery Efficiency: Exploring the Impact of AI*, 10 J. OPEN INNOVATION 100329 (2024), <https://www.sciencedirect.com/science/article/pii/S2199853124001239> (last visited May 12, 2026).

⁶⁰ INDIAN INST. OF PUB. ADMIN., *Digital Governance: Challenges and Strategies in the Digital Era* (2016), <https://www.iipa.org.in/GyanKOSH/posts/digital-governance-challenges-and-strategies-in-the-digital-era> (last visited May 12, 2026).

⁶¹ INDIA BRAND EQUITY FOUND., *Digital India* (2024), <https://www.ibef.org/government-schemes/digital-india> (last visited May 12, 2026).

demographic information of individuals.⁶² It was designed to establish a reliable identity verification mechanism capable of supporting the efficient delivery of government services and welfare benefits.

A. Aadhaar and welfare governance

The integration of Aadhaar into welfare programmes was based on the assumption that accurate beneficiary identification would improve governance outcomes. Before the introduction of Aadhaar-based systems, welfare schemes frequently faced challenges such as duplicate beneficiaries, fake identities, ghost ration cards, and the diversion of public resources.⁶³

To address these concerns, Aadhaar authentication was introduced across various welfare programmes. Beneficiaries receiving subsidies, pensions, scholarships, and food entitlements were required to authenticate their identities through biometric verification.

The use of Aadhaar was expected to achieve several objectives: the elimination of duplicate and fake beneficiaries; the reduction of corruption and leakages; improved targeting of welfare benefits; enhanced transparency and accountability; and better monitoring and record-keeping. These objectives aligned with broader governance reforms aimed at ensuring that public resources reached their intended beneficiaries.

B. Aadhaar authentication in the Public Distribution System

The Public Distribution System serves as the primary mechanism through which beneficiaries receive subsidised food grains under the National Food Security Act, 2013. To improve the efficiency of this system, Aadhaar-based authentication was integrated into ration distribution processes.

Under the digitised system, beneficiaries are often required to verify their identity through biometric authentication at electronic Point of Sale (e-POS) devices installed at fair-price shops.⁶⁴ The authentication process typically involves fingerprint or iris verification linked to Aadhaar records. Once authentication is successfully completed, the beneficiary becomes eligible to receive the allocated food grains. The transaction is digitally recorded, thereby creating an electronic audit trail intended to improve accountability and reduce malpractice. The introduction of e-POS devices and biometric verification has significantly altered the

⁶² INDIA BRAND EQUITY FOUND., *Digital India* (2024), <https://www.ibef.org/government-schemes/digital-india> (last visited May 12, 2026).

⁶³ PRESS INFO. BUREAU, GOV'T OF INDIA, *Aadhaar: A Unique Identity for the People* (2024), <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2067940> (last visited May 11, 2026).

⁶⁴ Ben Krishna & Thasni T., *Biometric Electronic Point of Sale Machines and Food Security*, 58 ECON. & POL. WKLY. (2023), <https://www.epw.in/journal/2023/33/commentary/biometric-electronic-point-sale-machines-and-food.html> (last visited June 10, 2026).

functioning of the Public Distribution System. Supporters argue that these reforms have strengthened transparency and reduced opportunities for corruption.

C. One Nation One Ration Card scheme

One of the most significant digital reforms in food security governance is the One Nation One Ration Card (ONORC) scheme.⁶⁵ The scheme enables beneficiaries to access food grains from any fair-price shop across the country irrespective of their state of residence. The initiative is particularly beneficial for migrant workers who frequently relocate in search of employment. Prior to the implementation of ONORC, migrants often faced difficulties in accessing food entitlements outside their home states. Digital integration has improved portability and expanded access to welfare benefits. The scheme demonstrates how technology can contribute positively to welfare governance when implemented in an inclusive manner.

D. Benefits of Aadhaar-based authentication

The integration of Aadhaar into food security governance has generated several administrative benefits. First, biometric authentication has reduced the incidence of duplicate and fake ration cards, and the elimination of ghost beneficiaries has contributed to more accurate beneficiary databases. Second, digital record-keeping has improved transparency by creating verifiable transaction records, enabling authorities to monitor distribution patterns and identify irregularities. Third, digitisation has strengthened accountability by reducing opportunities for manual manipulation and corruption. Fourth, portability initiatives such as One Nation One Ration Card have enhanced accessibility for migrant populations. Finally, technology has improved administrative efficiency by facilitating faster verification processes and better coordination among government agencies. Despite these benefits, significant concerns remain regarding the impact of technological dependence on vulnerable populations.

VII. DIGITAL EXCLUSION AND ITS IMPACT ON FOOD ENTITLEMENTS

Digital exclusion refers to the inability of individuals or groups to access, utilise, or benefit from digital technologies owing to various social, economic, technological, or infrastructural barriers.⁶⁶ In the context of welfare governance, digital exclusion occurs when beneficiaries are unable to access government services because of limitations associated with technology. Although the aim of digitisation is to improve efficiency, it may inadvertently create barriers

⁶⁵ DEPT OF FOOD, CIVIL SUPPLIES & CONSUMER PROT., MAH., *One Nation One Ration Card* (2015), <https://mahafood.gov.in/en/scheme/one-nation-one-ration-card/> (last visited June 10, 2026).

⁶⁶ Zihao Xue et al., *Digital Exclusion in Healthcare Services: A Scoping Review*, INT'L J. EQUITY HEALTH (2026), <https://pmc.ncbi.nlm.nih.gov/articles/PMC12895809/> (last visited June 11, 2026).

for individuals lacking technological access, digital literacy, or adequate infrastructure.⁶⁷ The issue becomes particularly concerning when access to essential rights such as food is made dependent upon technological systems.⁶⁸

A. Biometric authentication failures

One of the most frequently reported challenges in Aadhaar-enabled welfare delivery is biometric authentication failure.⁶⁹ Fingerprint authentication may fail for several reasons, including age-related deterioration of fingerprints, occupational wear among manual labourers, physical disabilities, poor-quality biometric records, and technical malfunctions. Such failures may prevent beneficiaries from receiving food grains despite being legitimately entitled to them under the National Food Security Act. The problem is especially severe among elderly persons, agricultural workers, construction labourers, and individuals engaged in physically demanding occupations.

B. Connectivity and infrastructure challenges

The effective functioning of Aadhaar authentication systems depends upon stable internet connectivity and technological infrastructure. However, many rural and remote regions continue to experience connectivity problems. Network disruptions, server failures, electricity shortages, and equipment malfunctions often interfere with authentication processes.⁷⁰ In such circumstances, beneficiaries may be denied access to food grains despite fulfilling eligibility requirements. Reliance on technology therefore creates vulnerabilities that did not exist under traditional distribution systems.

C. Digital illiteracy and social exclusion

Digital literacy remains uneven across different sections of Indian society. Large segments of the population, particularly within rural communities, elderly individuals, and economically

⁶⁷ Jinglin Xiao et al., *Overcoming Barriers and Seizing Opportunities in the Innovative Adoption of Next-Generation Digital Technologies*, 9 J. INNOVATION & KNOWLEDGE 100622 (2024), <https://www.sciencedirect.com/science/article/pii/S2444569X24001616> (last visited June 9, 2026).

⁶⁸ Eileen Kennedy et al., *Transforming Food Systems: The Missing Pieces Needed to Make Them Work*, 5 CURRENT DEVELOPMENTS NUTRITION (2021), <https://academic.oup.com/cdn/article/5/1/nzaa177/6030026> (last visited June 11, 2026).

⁶⁹ LIFE SAVING ORG., *Aadhaar Biometric Problem and Solution*, <https://www.lifesavingorganization.com/blogs/en/name-change/aadhaar-biometric-problem-solution-sambhal-aadhaar-update-help> (last visited June 9, 2026).

⁷⁰ *Network Issues Delay PDS Grain Distribution in Kodagu*, TIMES OF INDIA (2026), <https://timesofindia.indiatimes.com/city/mysuru/network-issues-delay-pds-grain-distribution-in-kodagu/articleshow/131394712.cms> (last visited June 9, 2026).

disadvantaged groups, possess limited familiarity with digital technologies.⁷¹ Beneficiaries may face difficulties understanding authentication procedures, updating records, linking Aadhaar numbers, or resolving technical issues. As a result, digital governance may inadvertently marginalise those who are least equipped to navigate technological systems.

The consequences of exclusion extend beyond administrative inconvenience. The denial of food entitlements can lead to increased hunger and food insecurity, malnutrition among vulnerable populations, the deterioration of health conditions, economic hardship, and the violation of human dignity. When technological barriers prevent access to food, the state's welfare obligations may remain unfulfilled despite the existence of legal entitlements.

VIII. SOCIO-LEGAL ANALYSIS

The interaction between technology and welfare governance presents both opportunities and challenges. Aadhaar-based authentication has undoubtedly improved administrative efficiency, reduced duplication, and enhanced transparency within the Public Distribution System. These achievements demonstrate the potential of digital technologies to strengthen public administration. However, the benefits of digitisation must be assessed alongside its social consequences. The existence of statutory food entitlements under the National Food Security Act implies that access to food should not be contingent upon flawless technological functioning. When authentication failures result in the denial of food grains, the rights-based character of the legislation is undermined. From a constitutional perspective, welfare governance must prioritise substantive justice over procedural formalities. The objective of food security legislation is to ensure access to food, not merely to establish efficient administrative systems. Consequently, technological mechanisms should operate as facilitative tools rather than exclusionary barriers.

The socio-legal analysis reveals a fundamental tension between efficiency and inclusiveness. While digital governance promotes accountability, excessive dependence on technology may disadvantage those who are already socially and economically vulnerable.⁷² The challenge lies in designing governance systems that combine technological innovation with adequate safeguards for the protection of fundamental rights.

⁷¹ Maria Grazia Diana et al., *The Digital Divide and the Elderly: How Urban and Rural Realities Shape Well-Being and Social Inclusion in the Sardinian Context*, 17 SUSTAINABILITY 1718 (2025), <https://doi.org/10.3390/su17041718> (last visited June 11, 2026).

⁷² Thi Lam Ho, Le Hong Ngoc & Thu Hoai Ho, *Digital Inclusion or Exclusion? Exploring the Moderating Role of Governance in Digitalization's Impact on Income Inequality in Developing Countries*, 10 RSCH. IN GLOBALIZATION 100283 (2025), <https://www.sciencedirect.com/science/article/pii/S2590051X25000164> (last visited June 11, 2026).

A balanced approach requires the availability of alternative verification mechanisms, robust grievance redressal systems, improved digital infrastructure, and continuous monitoring of exclusion risks.⁷³ Such measures can help ensure that technological reforms strengthen rather than weaken the realisation of the right to food.

The analysis further shows that food security cannot be viewed solely as an administrative concern. It is fundamentally linked to constitutional values, human rights principles, and social justice objectives. Any evaluation of digital governance must therefore consider not only efficiency outcomes but also its impact on vulnerable populations and their ability to access essential entitlements.

IX. FINDINGS OF THE STUDY

This paper has examined the relationship between the National Food Security Act, 2013, Aadhaar-based authentication, and the challenges of digital exclusion in welfare governance. Based on the analysis of legal provisions, constitutional principles, digital governance mechanisms, and socio-legal concerns, the following findings emerge.

A. Strengthening of the right to food through the National Food Security Act, 2013

This paper finds that the National Food Security Act, 2013 represents a significant milestone in India's welfare jurisprudence. The legislation transformed food assistance programmes from policy-based welfare measures into legally enforceable entitlements. By providing subsidised food grains and nutritional support to vulnerable populations, the Act has strengthened the realisation of the right to food and contributed to the constitutional objective of social justice. The Act has also expanded state responsibility in addressing hunger, malnutrition, and food insecurity. Its rights-based approach reflects a shift from discretionary welfare to entitlement-based governance, thereby enhancing accountability in food distribution systems.

B. Constitutional foundations of food security

This paper finds that, although the Constitution of India does not explicitly recognise the right to food as a separate fundamental right, judicial interpretation has incorporated food security within the broader framework of the right to life under Article 21. The Directive Principles of State Policy, particularly Article 47, further reinforce the state's obligation to improve nutrition and public health. The constitutional framework therefore provides a strong normative

⁷³ Dipika Jain, *Regulation of Digital Healthcare in India: Ethical and Legal Challenges*, 11 HEALTHCARE 911 (2023), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10048681/> (last visited June 11, 2026).

foundation for food security governance and justifies legislative interventions aimed at protecting vulnerable populations from hunger and deprivation.

C. Positive contributions of Aadhaar-based authentication

The integration of Aadhaar authentication into welfare programmes has generated several administrative benefits. This paper finds that digital verification mechanisms have contributed to improved identification of beneficiaries, a reduction in duplicate and fraudulent ration cards, enhanced transparency and accountability, better monitoring of food distribution processes, increased efficiency in record maintenance and service delivery, and greater portability of benefits through initiatives such as One Nation One Ration Card. These developments demonstrate that technology can play an important role in strengthening governance and improving the administration of welfare schemes.

D. Digital exclusion as a significant challenge

Despite the benefits of digitisation, this paper finds that Aadhaar-based authentication has also created new forms of exclusion. Beneficiaries often encounter difficulties arising from biometric authentication failures, poor internet connectivity, server and software malfunctions, inaccurate beneficiary databases, digital illiteracy, and administrative delays in updating records. Such challenges have resulted in the denial or disruption of food entitlements for certain beneficiaries, thereby undermining the objectives of the National Food Security Act.

E. Disproportionate impact on vulnerable groups

This paper finds that digital exclusion affects vulnerable populations more severely than other groups. Elderly persons, persons with disabilities, migrant workers, tribal communities, women, and rural populations face greater difficulties in navigating digital systems. This unequal impact raises concerns regarding substantive equality and social justice. Technological systems intended to promote inclusion may inadvertently deepen existing socio-economic inequalities if adequate safeguards are not provided.

F. Tension between technological efficiency and human rights

This paper identifies a fundamental tension between administrative efficiency and rights-based governance. While technology enhances monitoring and accountability, excessive dependence on digital authentication may restrict access to essential welfare benefits. The findings suggest that procedural compliance should not override substantive rights. Access to food, being closely connected to human dignity and survival, must remain the primary objective of food security governance.

G. Validation of hypotheses

The findings support the first hypothesis, namely that the National Food Security Act, 2013 has strengthened the realisation of the right to food by creating statutory entitlements. The second hypothesis is also validated, as Aadhaar-based authentication has improved transparency and efficiency but has simultaneously contributed to exclusion in certain cases owing to technological barriers. The third hypothesis is supported by the finding that inclusive safeguards and alternative authentication mechanisms can significantly reduce exclusion and improve access to food entitlements.

X. RECOMMENDATIONS AND SUGGESTIONS

The findings of this paper indicate that, while digital governance has considerable potential, reforms are necessary to ensure that technological systems remain consistent with constitutional values and welfare objectives.

A. Adoption of alternative authentication mechanisms

Biometric authentication should not be the sole method of verifying beneficiaries. Alternative mechanisms such as One-Time Password (OTP) verification, offline identity verification, ration card verification, and manual certification by authorised officials should be made available in cases where biometric authentication fails. The availability of multiple verification options would reduce the risk of exclusion and ensure continuity in food distribution.

B. Strengthening offline service delivery

Food distribution systems should continue to maintain offline service delivery mechanisms, particularly in regions with poor digital infrastructure. Beneficiaries should not be denied food entitlements solely because of technological failures. Offline alternatives can act as safeguards during network disruptions, server failures, or equipment malfunctions.

C. Improvement of digital infrastructure

The effectiveness of digital governance depends largely on the quality of technological infrastructure. The government should invest in improving internet connectivity, electricity supply, data management systems, and technological support services in rural and remote areas. Reliable infrastructure would reduce authentication failures and enhance the efficiency of welfare delivery.

D. Periodic updating of beneficiary databases

Errors in beneficiary databases often result in wrongful exclusion. Regular verification and

updating of records should be undertaken to ensure that eligible beneficiaries remain covered under the National Food Security Act. Special attention should be given to migrant populations, elderly beneficiaries, and economically vulnerable households.

E. Strengthening grievance redressal mechanisms

An effective grievance redressal system is essential for addressing exclusion-related complaints. Beneficiaries should have access to simple, accessible, and time-bound mechanisms for reporting problems and obtaining relief. The grievance process should be decentralised and supported by local authorities capable of responding promptly to complaints.

F. Promotion of digital literacy

Digital literacy programmes should be implemented to help beneficiaries understand authentication procedures, update records, and access welfare services effectively. Awareness campaigns may be conducted through local government institutions, educational institutions, community organisations, and civil society groups.

G. Special protection for vulnerable groups

Targeted measures should be adopted for elderly persons, persons with disabilities, tribal populations, and women, who may face greater challenges in accessing digital services. The government should develop inclusive policies that recognise the specific needs of vulnerable populations and provide additional support where required.

H. Continuous monitoring and evaluation

Regular assessments should be conducted to identify instances of exclusion and to evaluate the effectiveness of digital governance initiatives. Independent monitoring mechanisms can help ensure accountability and improve policy outcomes. Data relating to authentication failures and exclusion should be systematically collected and analysed to support evidence-based policymaking.

XI. CONCLUSION

Food security occupies a central position in the realisation of human dignity, social justice, and sustainable development. The enactment of the National Food Security Act, 2013 marked a significant advancement in India's welfare framework by transforming food assistance programmes into legal entitlements. Through its rights-based approach, the legislation seeks to ensure that vulnerable populations have access to adequate food and nutritional support.

The increasing digitisation of welfare governance has introduced new opportunities for improving transparency, efficiency, and accountability. Aadhaar-based authentication and related technological innovations have contributed to reducing duplication, strengthening monitoring mechanisms, and enhancing administrative effectiveness. Initiatives such as One Nation One Ration Card demonstrate the positive potential of technology in expanding access to welfare benefits.

However, this paper has demonstrated that technological progress is not without challenges. Biometric authentication failures, connectivity issues, database inaccuracies, and digital illiteracy have created barriers for many beneficiaries. These challenges have disproportionately affected vulnerable populations and, in some instances, have resulted in the denial of food entitlements.

The analysis highlights the importance of balancing technological efficiency with constitutional commitments to equality, dignity, and social justice. The right to food, as an integral component of the right to life, cannot be made contingent upon flawless technological functioning. Welfare systems must be designed in a manner that ensures that no individual is deprived of food owing to circumstances beyond their control.

This paper concludes that Aadhaar-based authentication should function as a facilitative mechanism rather than an exclusionary requirement. Technology should strengthen welfare delivery without compromising access to essential rights. The adoption of alternative authentication methods, stronger grievance redressal systems, improved infrastructure, and inclusive policy safeguards can significantly reduce the risks of digital exclusion.

Ultimately, the success of the National Food Security Act, 2013 should be measured not merely by technological efficiency or administrative convenience, but by its ability to ensure that every individual has meaningful access to food, dignity, and social justice. A truly effective food security system is one that combines innovation with inclusion, and governance with humanity.
