

LITERATURE REVIEW

Gender-Responsive Food Policies for Zero Hunger: Integrating Food Self-Sufficiency and Universal Nutritious Meals

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ABSTRACT

PURPOSE: This study examines how integrating Food Self-Sufficiency (FSS) and Universal Free Nutrition Meals (UFNM), within a gender responsive policy framework, can strengthen food and nutrition security, reduce structural inequities, and support sustainable human capital development.

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DESIGN/METHODOLOGY/APPROACH: A literature review was conducted, synthesising evidence from food systems, public health, social protection, and gender studies. A gender responsive analytical lens was applied to examine how FSS and UFNM policies shape differential access to food, nutrition, and care responsibilities, particularly among woman, caregivers, and vulnerable populations.

FINDINGS: FSS strengthens food system resilience but may insufficiently address gender-based nutrition disparities if implemented narrowly. UFNM programmes improve child nutrition, school participation, and cognitive development whole reducing caregiving and economic burdens on women.

ORIGINALITY/VALUE: This study proposes a novel gender-responsive framework linking food policy, nutrition equity, and human capital as integrated foundations for inclusive and sustainable development goals.

KEYWORDS: *Gender Equality; Food Self-Sufficiency; Universal Free Nutritious Meals; Nutrition Equity; Human Capital; Inclusive Development.*

INTRODUCTION

Despite sustained growth in global food production, hunger and malnutrition persist as major global development challenges. Recent estimates indicate that a substantial proportion of the world's population is unable to afford a healthy diet, even in countries where aggregate food availability is sufficient (FAO, 2020). This persistent gap between food availability and nutrition outcomes highlights the limitations of food policies that prioritise production metrics while underestimating social, economic, and institutional determinants of access, utilisation, and dietary quality (Haysom and Tawodzera, 2018).

Gender inequality constitutes one of the most enduring structural determinants shaping food and nutrition insecurity. Across low- and middle-income countries (LMICs), women occupy central positions within food systems as agricultural producers, food processors, traders, caregivers, and household nutrition decision-makers (Botreau and Cohen, 2020). Nevertheless, women's contributions remain systematically undervalued and constrained by unequal access to land, credit, extension services, markets, and political voice, as well as disproportionate unpaid care and domestic work (Njuki *et al.*, 2022; Visser and Wangu, 2021). These constraints shape not only patterns of food production, but also intra-household food allocation, dietary diversity, and vulnerability to food system shocks (Mamassi *et al.*, 2026).

Empirical evidence consistently demonstrates that women and girls face higher risks of food insecurity and malnutrition due to intersecting disadvantages related to income inequality, labour segmentation, and social norms governing food distribution and care responsibilities (Njuki *et al.*,

2022; Venance *et al.*, 2025). Consequently, food policies that are gender-blind risk reinforcing existing inequalities, even when they succeed in increasing food supply or stabilising markets.

Policy responses to food insecurity have traditionally followed two broad trajectories. The first emphasises Food Self-Sufficiency (FSS), prioritising domestic production, price stabilisation, and reduced dependence on international markets. The second trajectory focuses on nutrition-specific and nutrition-sensitive interventions, including school feeding and free meal programmes, designed to improve immediate dietary intake and support human development outcomes, particularly among children (Zulkifli *et al.*, 2025).

While both approaches have demonstrated measurable benefits, they are frequently implemented in parallel policy silos and with limited attention to gendered impacts. Evidence suggests that FSS policies may enhance national food availability and macro-level resilience, yet do not automatically translate into improved dietary quality or equitable nutrition outcomes at the household level (Ikudayisi and Adejumo, 2025).

Conversely, UFNM programmes have consistently demonstrated positive impacts on child nutrition, school participation, and cognitive development. During periods of economic or systemic shock, such programmes function as critical nutritional safety nets, as illustrated by the deterioration in child dietary quality following the suspension of school meal programmes during the COVID-19 pandemic (Thankachan *et al.*, 2022). In addition to direct nutrition benefits, Universal Free Nutrition Meals (UFNM) programmes reduce unpaid care and food preparation burdens borne disproportionately by women, generating indirect gains in wellbeing and economic participation (Nichols, 2021).

Despite these documented benefits, UFNM programmes are rarely conceptualised as integral components of food system transformation. When implemented in isolation, they may face challenges related to fiscal sustainability, governance capacity, and weak linkages to domestic food systems. Similarly, FSS policies implemented without explicit equity mechanisms risk reinforcing gendered labour burdens and unequal access to productive resources (Liddy *et al.*, 2023).

This study argues that integrating FSS and UFNM within a gender-responsive food policy framework offers a more coherent and equitable pathway to zero hunger. By recognising food systems as socially embedded and gendered, this approach moves beyond fragmented policy responses and aligns food availability, access, and utilisation within a single analytical and policy framework. The study aims to synthesise existing evidence on how integrated FSS–UFNM policies influence nutrition equity and human capital development, and to identify policy design principles relevant to contemporary food policy debates.

METHODS

This study employed a literature review combined with policy-oriented analytical synthesis to examine gender-responsive food policy pathways linking FSS and Universal Free Nutritious Meals (UFNM). Adhering strictly to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, an initial search identified 3,430 records. Following the removal of 945 duplicates, the remaining 2,486 citations were screened against temporal (past decade) and linguistic (English-language) criteria, alongside an internal quality filter requiring studies to explicitly define, measure, or evaluate research impact. Title and abstract screening excluded 2,170 records irrelevant to health, nutrition, policy, or research impact. Full-text assessment of the remaining 315 records resulted in the exclusion of 300 articles due to insufficient policy focus ($n=55$), failure to define research impact ($n=70$), or inappropriate study design ($n=70$). Supplemented by manual reference list screening, 15 high-quality studies were ultimately selected (See Figure 1).

Data extraction systematically captured publication year, geographical context, policy focus (FSS, UFNM, or integrated), policy instruments, gender-responsive mechanisms, and human capital outcomes. Due to significant heterogeneity in study designs and outcome measures, a narrative synthesis approach was utilised instead of a statistical meta-analysis.

This analytical framework relied on descriptive and semi-quantitative mapping, using counts and proportions based on policy type and gender integration to evaluate the trade-offs and complementarities between FSS and UFNM pathways. Whilst methodological rigour was safeguarded via PRISMA and strict quality filters, limitations include the exclusion of non-English publications, which may restrict perspective diversity, and variations in geographical contexts, which may reduce direct data comparability (See Table 1).

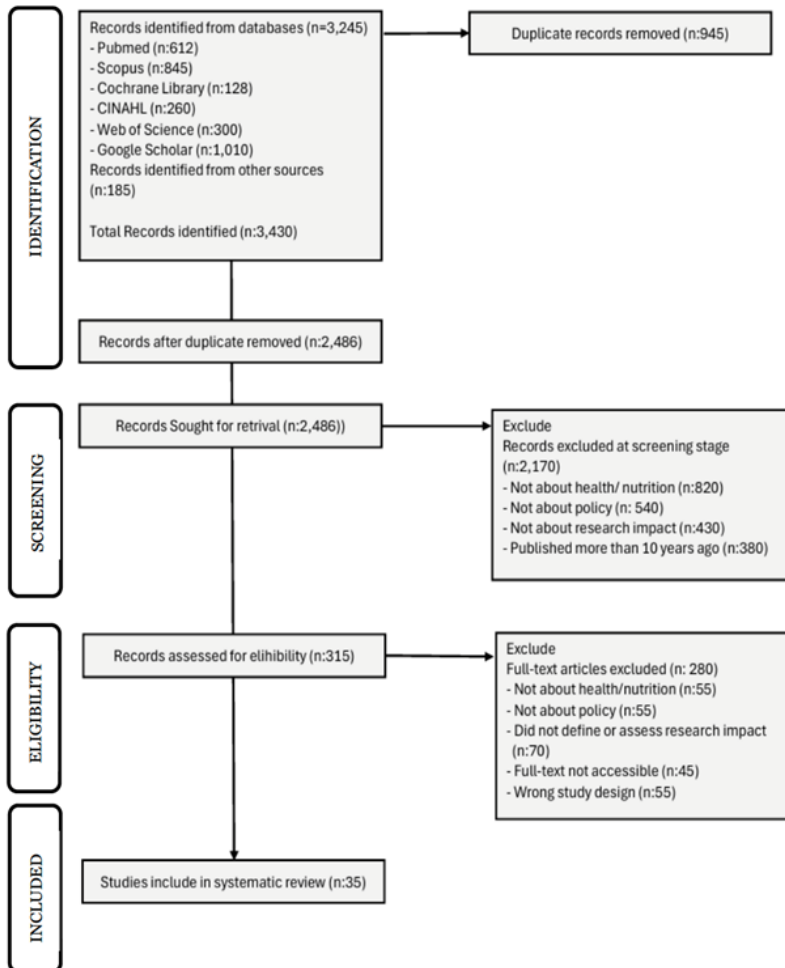


Figure 1: PRISMA Flow Diagram of Study Selection

Source: Constructed by authors

Table 1: Analytical Themes and Extracted Concepts from ONC (2025) Findings

No.	Study	Gender Power and Government Policy	Food and Nutrition Security	Zero Hunger and Nutritional Future Socioeconomic
1	Abay <i>et al.</i> (2021)	Impact of policy disruptions (COVID-19) on school services.	Highlights exacerbation of food insecurity in Nigeria.	Long-term risk to child development due to missing safety nets.
2	Andini (2025)	Evaluation of the "Free Nutritious Meals" state programme.	Focuses on community nutrition for Indonesian children.	Strengthening human capital through early nutrition.

No.	Study	Gender Power and Government Policy	Food and Nutrition Security	Zero Hunger and Nutritional Future Socioeconomic
3	Botreau and Cohen (2020)	Gender inequality as a barrier to poverty alleviation.	Rural women bearing the brunt of food price crises.	Sustainable poverty reduction through female empowerment.
4	Candra <i>et al.</i> (2025)	Analysis of governance failure in state meal programmes.	Discusses state responsibility in nutritional provision.	Socioeconomic risks of poorly managed public programmes.
5	de Wee and Jakoet-Salie (2025)	Need for policy integration to fix fragmented government action.	National policy on food security in South Africa.	Overcoming systemic poverty through integrated governance.
6	Di Prima <i>et al.</i> (2022)	Implementation lessons from local/ethnic minority pilots.	Home-grown school feeding (HGSF) models in Vietnam.	Community-led economic resilience and child health.
7	Doss (2018)	Reframing issues of women's agricultural productivity.	Link between gender and food system efficiency.	Economic growth via closing the gender gap in agriculture.
8	FAO (2020)	Global policy recommendations for nutrition.	Comprehensive data on global hunger and malnutrition.	Roadmap for achieving SDG 2 (Zero Hunger) by 2030.
9	Haghpars-Bidgoli <i>et al.</i> (2022)	Nutrition-sensitive agricultural interventions.	Increasing maternal and child dietary diversity in rural India.	Economic evaluation of health-led agricultural growth.
10	Haysom and Tawodzera (2018)	Gaps in urban policy and assessment measurement.	Urban-scale food security assessment challenges.	Necessity of urban planning for future food equity.
11	Ikudayisi and Adejumo (2025)	Bibliometric analysis of urban food policy.	Perspective on Sustainable Development Goal 2.	Future-proofing urban centres against food scarcity.
12	Khang (2025)	Social investment in health/education policy.	Linkage between nutrition and labour productivity.	Human Capital: Vietnam's case for labour-led growth.
13	Lah (2025)	Breaking "silos" in integrated government policy.	Sustainable development and climate action nexus.	Socioeconomic stability via climate-resilient food systems.
14	Larota-Aguilera <i>et al.</i> (2025)	Lessons from European urban public initiatives.	Community-based initiatives for food insecurity.	Policy-driven equity in developed urban economies.
15	Liddy <i>et al.</i> (2023)	Food mapping as a tool for urban transformation.	Understanding food systems in the Global South.	Strategic planning for rapid-growth city regions.
16	Mamasi <i>et al.</i> (2026)	Trade-offs in FSS policy.	Underlying mechanisms of national food availability.	Economic impacts of pursuing absolute food autonomy.
17	McKenzie <i>et al.</i> (2022)	Incorporating a "gender lens" into health policy.	Analysis of Fijian nutrition and health perspectives.	Health equity as a driver for national wellbeing.
18	Morgan <i>et al.</i> (2024)	Gender-responsive monitoring of health systems.	Accountability in nutritional and health delivery.	Strengthening institutional capacity for future equity.

No.	Study	Gender Power and Government Policy	Food and Nutrition Security	Zero Hunger and Nutritional Future Socioeconomic
19	Mumah <i>et al.</i> (2025)	Identifying global policy gaps in food systems.	Exploring the reality of global food insecurity.	Addressing the "hidden hunger" in future global policy.
20	Nichols (2021)	Rethinking behaviour changes in women's groups.	Nutrition-sensitive agriculture and social medicine.	Social capital as a driver for nutritional change.
21	Njuki <i>et al.</i> (2022)	Empowerment as a pillar for food system reform.	Review of gender equality in global food systems.	Transformation of food systems through social equity.
22	Olney <i>et al.</i> (2022)	Impacts of social assistance programmes on women.	Improving women's and children's diets.	Breaking the intergenerational cycle of malnutrition.
23	Pierotti <i>et al.</i> (2022)	Time constraints on married women's labour.	Agricultural production in southwestern Nigeria.	Productivity losses due to gendered labour constraints.
24	Ridwan and Suranto (n.d.)	Indonesian strategies for achieving food security.	Response to the global food crisis.	Strengthening national resilience against global shocks.
25	Sulich and Sołoducho-Pelc (2025)	Green management styles in production.	Integrating environmental strategy with sustainability.	Future of sustainable production and food processing.
26	Suprpto <i>et al.</i> (2025)	Policy review of the MBG (Free Meal) programme.	Implementation metrics for Indonesian food policy.	Sustainable development planning for future generations.
27	Surtiari <i>et al.</i> (2024)	Informal social protection and climate adaptation.	Relevance of social systems to climate change.	Climate-adaptive socioeconomic safety nets.
28	Thankachan <i>et al.</i> (2022)	Impact of COVID-19 lockdown on school meals.	Nutrition of primary school children in India.	Economic cost of nutritional setbacks in school-age kids.
29	Torquati and Rossi (2025)	Procurement policy for school food.	Transition to sustainable local food systems.	Synergies between local agriculture and public health.
30	Venance <i>et al.</i> (2025)	Mainstreaming gender in LMIC food policies.	Landscape analysis of healthy diets.	Future health outcomes through gendered food policy.
31	Visser and Wangu (2021)	Dual centrality of women in food solutions.	Need for gender lens in system transformation.	Equitable distribution of food resources and power.
32	Walls and Matita (2023)	Trade-offs in addressing dietary diversity.	Balancing food security with nutritional quality.	Policy decisions impacting future disease burdens (NCDs).
33	Yusriadi (2025)	Systematic review of free meal programme impacts.	Quantitative assessment of food security improvements.	Validating state-led nutritional interventions.
34	Zhang <i>et al.</i> (2022)	Role of food supply in energy transitions.	Land-use and food security intersection.	Balancing energy needs with the necessity of food production.
35	Zulkifli <i>et al.</i> (2025)	Policy responses in South Sulawesi.	Challenges toward sustainable self-sufficiency.	Regional economic growth through agricultural autonomy.

Source: Analysed by authors

The reviewed literature indicates that FSS policies enhance national food availability and resilience against external shocks (Ikudayisi and Adejumo, 2025; Venance *et al.*, 2025). However, these national-level gains do not inherently translate into equitable household nutrition, particularly for women and children (Mumah *et al.*, 2025). A primary limitation is the production-centred bias of FSS strategies, which often prioritises staple crops over dietary diversity, thereby failing to address ‘hidden hunger’ (Ridwan and Suranto, 2025; Walls and Matita, 2023).

Structural gender inequalities further mediate these outcomes; despite women’s significant role in agriculture, systemic barriers to resources restrict their ability to benefit from productivity gains (Njuki *et al.*, 2022; Visser and Wangu, 2021). Consequently, FSS-driven growth often reinforces existing disparities, with benefits accruing to male or commercial actors (Pierotti *et al.*, 2022). Moreover, such interventions may exacerbate women’s unpaid labour, leading to a ‘feminisation of responsibility without empowerment’, which hinders the conversion of food availability into improved nutritional wellbeing (Doss, 2018; McKenzie *et al.*, 2022).

Conversely, UFM programmes demonstrate consistently positive effects on child nutrition, human capital development, and school attendance (Olney *et al.*, 2022). Beyond direct nutritional benefits, UFM acts as a critical safety net, mitigating economic and health shocks while reducing the disproportionate care burden placed on women and girls (Abay *et al.*, 2021; Andini, 2025; Yusriadi, 2025).

Ultimately, evidence suggests that the most effective pathway to nutrition equity lies in the integration of FSS and UFM policies. Aligning these strategies, such as through local procurement models, creates stable demand for domestic production while simultaneously enhancing dietary diversity and women’s economic participation (Di Prima *et al.*, 2022; Sulich and Sołoducho-Pelc, 2025).

DISCUSSION

The findings of this review reinforce the argument that zero hunger cannot be achieved through production-centred strategies alone. Although FSS policies improve national food availability and resilience, their nutrition impacts remain constrained by gendered inequalities in access to resources, labour relations, and decision-making power (Njuki *et al.*, 2022; Venance *et al.*, 2025). This confirms broader food policy scholarship emphasising that food security outcomes are socially embedded and shaped by institutional arrangements and power dynamics.

Reframing zero hunger as a nutrition equity challenge shifts policy attention from aggregate output indicators towards access, affordability, and utilisation. Evidence from urban and national food system studies shows that malnutrition can persist even in contexts of adequate food supply when gender and income inequalities are left unaddressed (Ikudayisi and Adejumo, 2025). From this perspective, gender equality is not a secondary consideration but a core determinant of food system performance and human development outcomes.

UFNM programme provides a partial corrective to the limitations of production-centred food policies by socialising responsibility for nutrition. By decoupling child nutrition outcomes from household income and gendered labour dynamics, UFNM schemes reduce unpaid care burdens and support human capital development (Candra *et al.*, 2025). These programmes play a stabilising role during crises, reinforcing their importance as core social infrastructure rather than temporary safety nets (Surtiari *et al.*, 2024).

However, the discussion also highlights that UFNM programme risk remaining palliative if implemented without broader food system integration. When food for UFNM programme is sourced primarily through imports or ultra-processed products, opportunities to support domestic producers and stimulate local food systems are limited (McKenzie *et al.*, 2022). This underscores the importance of policy coherence between production and consumption domains. Integrated FSS–UFNM strategies, particularly those linking public food procurement to domestic agriculture, offer a coherent policy pathway that aligns food availability, access, utilisation, and stability (Larota-aguilera and Moragues-faus, 2025; Suprpto *et al.*, 2025). Such integration enhances dietary diversity, strengthens local food economies, and advances gender equality when women producers are prioritised (Njuki *et al.*, 2022).

Nevertheless, achieving integration requires overcoming persistent governance challenges, including fragmented institutional mandates, siloed budgeting processes, and weak inter-sectoral coordination (de Wee and Jakoet-Salie, 2025). The absence of sex-disaggregated monitoring and evaluation systems further limits accountability and learning across policy (Morgan *et al.*, 2024). From a political economy perspective, integrating FSS and UFNM involves navigating trade-offs between efficiency, equity, and fiscal sustainability (Zhang *et al.*, 2022). While UFNM programme requires sustained public investment, the long-term returns in human capital, productivity, and reduced health costs justify such investments (Khang, 2025).

Overall, the discussion positions gender-responsive integration of FSS and UFNM as a strategic food policy approach that bridges the gap between food availability and nutrition outcomes, aligns SDG 2 (Zero Hunger) and SDG 5 (Gender Equality), and generates spillover benefits for SDG 3 (Good Health and Wellbeing) and SDG 4 (Quality Education). Food policy, therefore, should be understood not merely as a response to food scarcity, but as a foundational investment in equitable and sustainable development.

Policy Implications

These findings carry significant implications for the design of policies aimed at achieving zero hunger. First, the evidence highlights the limitations of production-centred paradigms; while FSS enhances national resilience, its impact on nutrition is constrained unless gendered inequalities in access and care are explicitly addressed (Njuki *et al.*, 2022). Consequently, policymakers should adopt evaluation frameworks that prioritise dietary diversity, micronutrient adequacy, and gender-disaggregated outcomes alongside aggregate production metrics (Haghparast-Bidgoli *et al.*, 2022).

Second, the consistent benefits associated with UFNM suggest these should be institutionalised as core social infrastructure rather than temporary safety nets. UFNM programmes not only improve child nutrition and human capital but also significantly reduce the disproportionate burden of unpaid care borne by women (Thankachan *et al.*, 2022).

Third, the research underscores the necessity of policy coherence. Linking UFNM procurement to domestic agricultural production provides a practical mechanism to align availability and access objectives (Torquati and Rossi, 2025). When procurement frameworks prioritise smallholders and women, integrated FSS–UFNM strategies can simultaneously strengthen local economies and improve household nutrition (Haghparsat-Bidgoli *et al.*, 2022). However, realising these synergies requires overcoming fragmented governance, siloed budgeting, and weak inter-sectoral coordination (Lah, 2025). Finally, establishing robust, sex-disaggregated monitoring and evaluation systems is essential to ensure accountability and guarantee that food policies deliver equitable, sustainable impacts.

ETHICAL STATEMENT

This systematic review and meta-analysis rely entirely on previously published, secondary aggregate data. Therefore, institutional review board (IRB) approval and informed patient consent were not required. The study involved no primary human or animal participants, and no individual patient-level data were accessed, ensuring total confidentiality. The authors declare that all data extraction and reporting were conducted with full intellectual integrity and in strict compliance with standard academic codes of practice, with all source materials and potential conflicts of interest transparently disclosed.

AUTHOR CONTRIBUTIONS

MA: Conceptualisation, formal analysis, writing the original draft, review, editing, and supervision. DMD: Methodology, validation, investigation, project administration. FAHHS: Formal analysis, data curation, visualisation, review and editing. MOS: Conceptualisation, methodology, validation, and writing the original draft. All authors have read and agreed to the published version of the manuscript. The authors declare there are no conflict of interest.

CONCLUSIONS

This study demonstrates that achieving zero hunger requires a fundamental rethinking of how food policy is conceptualised and operationalised. Evidence synthesised through a PRISMA-guided systematic review and policy-oriented analysis shows that FSS and UFNM address distinct but

interdependent dimensions of food security. When pursued in isolation, each approach delivers partial gains while leaving structural nutrition inequities, particularly those shaped by gender largely unresolved.

FSS policies enhance national food availability and resilience, yet their nutrition impacts are constrained by gendered inequalities in land access, labour relations, and decision-making power. UFM programmes, by contrast, consistently improve child nutrition and human capital outcomes while reducing unpaid care burdens borne disproportionately by women. Their transformative potential, however, is maximised only when embedded within broader food system strategies that support domestic production and inclusive governance.

The central contribution of this study lies in demonstrating that gender-responsive integration of FSS and UFM offers a more coherent and equitable pathway to zero hunger. Such integration aligns food availability, access, utilisation, and stability, while explicitly addressing distributional and gendered dimensions of food systems. By linking public food procurement to domestic agriculture, prioritising women producers, and institutionalising nutrition standards, integrated policies can simultaneously advance SDG 2 (Zero Hunger) and SDG 5 (Gender Equality), with important spillover benefits for health and education. In an era of increasing climate, economic, and geopolitical volatility, food policy should be understood not merely as a response to scarcity, but as a strategic investment in equitable, resilient, and sustainable development.

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BIOGRAPHY



Professor Muryanto Amin has been Rector of Universitas Sumatera Utara since 2021, leading a period of institutional transformation that emphasises inclusive growth, social equity, and knowledge-based development. His leadership emphasises community engagement, public health initiatives, gender-responsive environments, and collaborative programmes with government, industry, and international partners.



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Dr Fauzan Azmi Hasti Habibi Samosir is a medical practitioner doctor experienced research assistant with 6 years of expertise in pharmacology, infectious disease (parasitology and microbiology), public health, and biomolecular research, specialising in molecular biology, compound analysis and data interpretation. Skilled in experimental design, systematic review, laboratory management, and scientific publication. Strong analytical and collaborative skills with a passion for advancing biomedical research.



Professor Marcello Otako Sato is a Professor at Niigata University of Pharmacy and Medical and Life Sciences, Japan. He is a Brazilian parasitologist and global health researcher, and trained in veterinary medicine in Brazil. His research centres on schistosomiasis and other helminth infections, with emphasis on environmental DNA surveillance, rapid point-of-care diagnostics, and community-based control strategies. By linking scientific innovation with field-based solutions and international partnerships, his work supports stronger health systems, protects vulnerable communities, and promotes sustainable approaches to infectious disease control, advancing global health equity and environmental resilience.

