Working Paper III

Food Loss and Waste Across the BRICS: Status, Drivers, Institutional Responses, and the Cooperative Opportunities

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Contents

Abstract

Food loss and waste (FLW) is a systemic failure of agri-food systems that simultaneously erodes food security, accelerates environmental degradation, and destroys economic value throughout the supply chain. However, country-level evidence on FLW within the BRICS, which collectively produce about 42 % of global food from about a third of the world's agricultural land and are home to about 45 % of the human population, remains fragmented, methodologically inconsistent, and inadequately integrated into either national policy or multilateral governance. This article provides a review of the available empirical literature on FLW across the BRICS economies, based on published sources spanning peer-reviewed articles, government-commissioned studies, policy briefs and institutional reports from 2017 to 2026. It answers three research questions: (1) the status of FLW in each BRICS member country; (2) the key drivers of FLW in each one of them; and (3) the best practices, institutions and strategies they have adopted to address it. On this basis, it then asks how the BRICS platform can deepen engagement, collaboration and partnership so that members benefit mutually. The review found that the distribution of FLW across the value chain follows a developmental gradient. Lower-income members disproportionately lose food at the post-harvest, storage, and processing stages, while higher-income members predominantly waste it at the food-service and household stages. However, the gradient is not mechanically predictable, and deep measurement heterogeneity renders headline cross-country comparisons misleading. Institutional responses range from binding legislation, as in China, to intersectoral national strategies (Brazil, South Africa, Ethiopia, Indonesia, Saudi Arabia), to behaviour change (India), and to food-rescue initiatives (UAE, Egypt). The article argues that the very heterogeneity that thwarts uniform targets is the basis for a meaningful complementarity. Surplus producers and import-dependent members, technology leaders and infrastructure-deficient members, and legislators and experimenters can transfer finance, technology, data standards, and policy models to one another through existing BRICS vehicles, such as the BRICS Agricultural Research Platform (BARP), Basic Agricultural Information Exchange System (BAIES), the New Development Bank (NDB), etc. It concludes that India's 2026 chairship offers a timely window to institutionalise a stage-specific, evidence-grounded and differentiated approach to FLW cooperation, rather than a uniform percentage-reduction target.

Keywords: *Food Loss and Waste, BRICS, Measurement Heterogeneity, and South–South Cooperation*

1. Introduction

Food loss and waste (FLW) results in the disposal of about 1.05 billion tonnes of food each year at the retail, food-service and household levels, in addition to roughly 13.3 per cent of global food production lost earlier in supply chains before reaching retail (UNEP, 2024) (Figure 1). These two values correspond to the headline sub-indicators of Sustainable Development Goal (SDG) target 12.3, the FAO Food Loss Index (FLI) and the UNEP Food Waste Index (FWI), which are the most frequently cited benchmarks in global FLW governance. Beneath these aggregates, however, lies a complex empirical landscape in which national FLW profiles, the key points of value-chain loss, data availability and policy responses differ enough that aggregate statistics can be actively misleading for policy planning.

Figure 1: Key statistics on global FLW

Within the BRICS grouping, this heterogeneity is more pronounced. As of 2026, the bloc comprises eleven full members: Brazil, Russia, India, China, and South Africa, joined by Egypt, Ethiopia, Iran, Saudi Arabia, and the United Arab Emirates from January 2024, and by Indonesia from January 2025 (Figure 2).

Together, they produce about 3/4th of global agricultural production, possess roughly a third of the world's agricultural land, and are home to about half of the world's 550 million family farms, many of which are run by small-scale producers (*D´Auria*, 2025). They also span the entire development spectrum, from Sub-Saharan Africa's most industrialised economy (South Africa) to one of its most food-insecure (Ethiopia); from the world's largest wheat exporter (Russia) to among the most food-import-dependent economies in the world (the UAE and Saudi Arabia). This developmental diversity is mirrored in their FLW profiles. Some studies estimate China's annual supply-chain FLW at around 349 million tonnes (Xue et al., 2021). In comparison, Russia is estimated to discard on the order of 17–18 million tonnes at storage, retail and consumption stages combined (Foodbankrus, 2019).

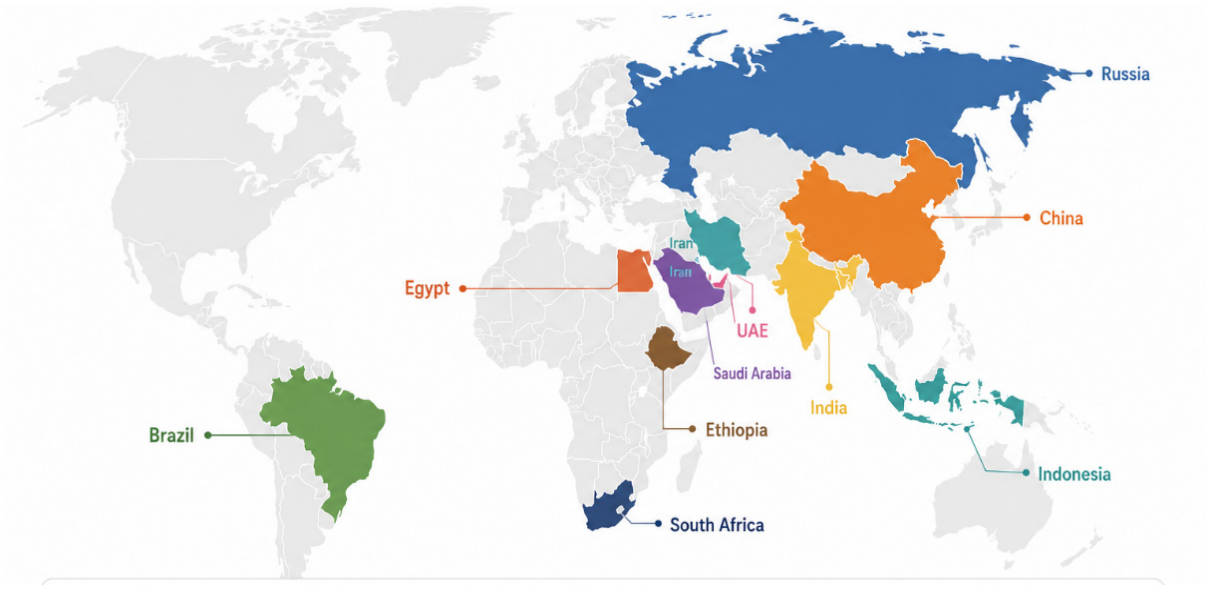
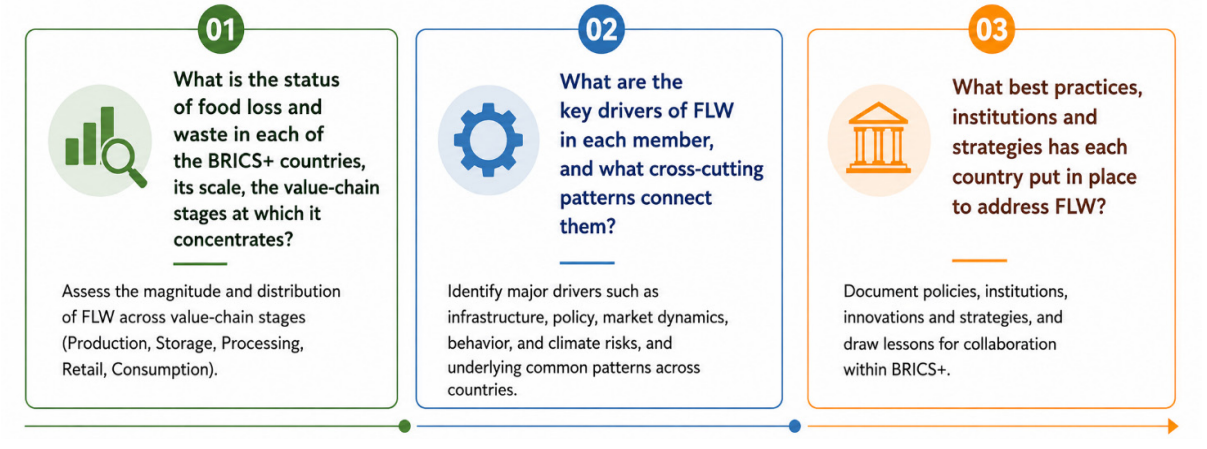


Figure 2: Geographical positioning of BRICS member countries in the world as of June 2026

A thorough, comparative review of FLW evidence across the BRICS economies is overdue for three reasons. First, the existing literature on FLW is country-specific, as prior studies have systematically synthesised and critically evaluated the evidence across all 11 members without a unified analytical framework. Second, the methodological differences among available estimates, in scope (which stages and commodities), data source (primary survey versus secondary modelling), reference period and definition, mean that widely repeated figures are frequently not comparable and should not be treated as equivalent in policy analysis. Third, with India holding the BRICS Chairship in 2026 and hosting the 18th Summit in New Delhi, FLW reduction and food security are firmly on the bloc's agricultural agenda; a robust evidence base is needed to design commitments appropriate to each member rather than uniform targets applied to structurally divergent systems. This review is organised around three questions and a synthesising fourth.



Building on the answers to the above question from 1 to 3, the fourth part addresses how the BRICS platform can deepen engagement, collaboration, and partnership so that

members mutually benefit from one another's evidence, technology, finance, institutions and policy experience.

Section 2 sets out the analytical framework and definitional conventions. Section 3 maps the country-by-country status of FLW across the eleven members and a synthesis of cross-cutting patterns. Section 4 examines the drivers of FLW by country and the developmental gradient that connects them. Section 5 reviews the laws, government strategies and voluntary initiatives in place in each country and distils transferable best practices. Section 6 develops the central argument, how the BRICS platform can convert this heterogeneity into mutual benefit. Section 7 sets out policy implications and a stage-specific priority-intervention matrix; Section 8 identifies evidence gaps and a future research agenda; and Section 9 concludes.

2. Conceptual Framework and Methodology

The FLW literature uses overlapping and sometimes conflicting definitional frameworks. This review adopts the dual-definition structure of the SDG 12.3 governance framework. Food loss refers to the reduction in the quantity or quality of food caused by decisions and actions of food suppliers in the chain, excluding retailers, food-service providers and consumers (FAO, 2014; HLPE, 2014). Food waste refers to food fit for human consumption that is discarded or allowed to spoil at the retail, food-service and household levels (FAO, 2014) (Figure 3). This distinction maps directly onto the two SDG 12.3 sub-indicators, the FLI (SDG 12.3.1a, monitored by FAO) and the FWI (SDG 12.3.1b, monitored by UNEP).

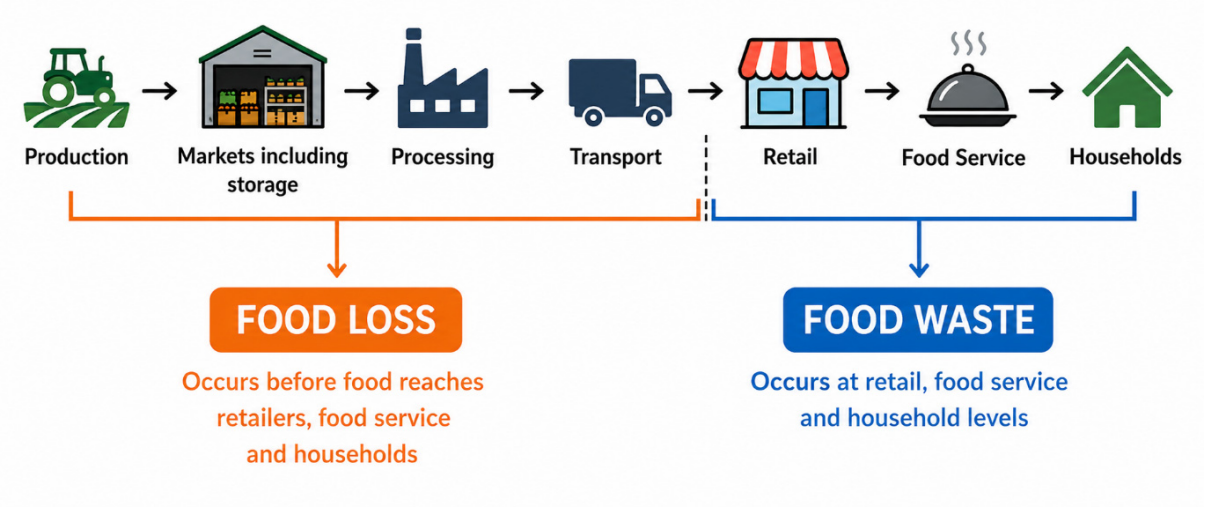


Figure 3: Conceptual difference between food loss and food waste

A central methodological problem is that most published country-level estimates do not strictly follow either the FLI or the FWI scope. National studies differ in (i) whether pre-harvest on-farm losses are included; (ii) whether losses are reported by weight or by value, or by per capita basis; (iii) which commodity groups are covered; (iv) whether primary

survey data or secondary modelling assumptions are used; and (v) the reference year. As a result, comparing headline FLW percentages or total tonnages across countries is often inappropriate without explicit harmonisation (Oelofse et al., 2021). Wherever relevant, this review flags these limitations in its critical evaluation rather than reproducing figures uncritically.

The review applies the food value-chain stage typology established by FAO (2011) and used consistently in the FLI and FWI frameworks: (1) agricultural production / pre-harvest; (2) post-harvest handling and storage; (3) processing and packaging; (4) distribution and retail; (5) food service; and (6) household consumption (Figure 4). Stage-specific evidence is presented where available, because the dominant loss stage has direct implications for the type of intervention required; where only aggregate data are available, this is noted.

Figure 4: Illustrative presentation of Food Value Chain Typology

The synthesis draws on more than forty sources covering all eleven members, supplemented by cross-cutting methodological and policy references, including the FAO/UNEP SDG 12.3 indicators, the Harvard Law School Food Law and Policy Clinic / Global Food Banking Network Food Donation Policy Atlas, and a system-wide root-cause framework for FLW mitigation (Dora et al., 2021). Country evidence ranges from large primary field surveys (China; India's NABCONS study) and national government studies (Indonesia's BAPPENAS study; South Africa's CSIR report; Ethiopia's postharvest management strategy (PHMSE)) to peer-reviewed commodity studies (Saudi Arabia; Egypt's wheat value chain; Iran's bread waste) and, for the least-documented members, regional estimates and policy briefs.

3. The Status of Food Loss and Waste Across the BRICS

This section maps FLW status member by member, noting in each case the best available estimate and the predominant loss stage.

3.1 Brazil

A notable irony marks Brazil's FLW profile. While it is the world's leading exporter of soybeans, beef and sugar, it loses roughly 30 per cent of its fruit production and 35 per cent of its vegetable production to post-harvest losses (Freire Junior & Soares, 2020). Grain losses can reach 50 per cent at the storage stage owing to technical inefficiencies in storage silos (Costabile, 2017, in Freire Junior and Soares, 2020), with average losses of up to 20 per cent of total national grain production (Martins & Farias, 2002, in Freire Junior and Soares, 2020). A national accounting by Dal'Magro and Talamini (2019) reported an average national FLW of 427 kg/capita/year, including 327 kg/capita/year of edible food. These supply-chain grain-loss rates are among the highest documented for any large agricultural exporter, and contrast sharply with Russia's lower post-harvest grain losses in its more mechanised system.

The causal structure is well characterised by inadequate field handling, improper packaging, overloaded vehicles, poor roads, bulk marketing and the absence of cold storage at supply centres, with transport identified as a leading cause of mechanical damage for perishables moved over long distances (Freire Junior & Soares, 2020). A systematic review (Ruviaro et al., 2020) confirms that Brazilian data are concentrated at the distribution and consumption stages, leaving other stages thinly documented. Importantly, Brazil is one of the few BRICS members whose household food-waste estimates UNEP (2024) considers suitable for SDG 12.3.1b tracking, an evidence advantage reflecting Embrapa's institutional capacity and earlier investment in food-systems research and infrastructure.

3.2 Russia

Russia's FLW profile is the most analytically ambiguous among the members. TIARCENTER research, reported by Foodbank Rus (2019), estimated that about 17 million tonnes were discarded annually at storage, retail, and consumption; Zinina et al. (2024) reported 17.9 million tonnes by end-2022, generating some 64 million tonnes of CO□-equivalent. Per capita, this implies roughly 119–123 kg per year at storage-to-consumption stages. The same country's FLW appears radically different across supply chain stages and methodologies. Official Rosstat figures put the loss at only 0.6 per cent of production, while SKOLKOVO (2019) estimates range from 30–40 per cent, underscoring severe data gaps.

Russia joined the FAO SAVE FOOD initiative in 2017, with the Dairy Union of Russia and Foodbank Rus citing a 'culture of respect for food' (FAO, 2017). However, Zinina et al. (2024) note that Russian legislation contains no measures to incentivise businesses to reduce economic losses, and that no executive authority is specifically responsible for national FLW policy, a significant governance gap for the world's largest wheat exporter.

3.3 India

The National Bank for Agriculture and Rural Development (NABARD) Consultancy Services (NABCONS) study for the Ministry of Food Processing Industries (2022) provides stage- and commodity-specific post-harvest loss estimates across agro-climatic zones for 54 commodities. The status of post-harvest loss varies from commodity to commodity, like in the food grains, 3.89–5.92 per cent, pulses, 5.65–6.74 per cent, oilseeds, 5.95–6.96 per cent, fruits, 6.02–15.05 per cent, and vegetables, 4.87–11.61 per cent (Table 1). The study values annual monetary post-harvest loss at about ₹1,52,790 crore. These figures improve on the Jha et al. (2015) study but mask large intra-country variation.

Devi and Devi (2025) reported aggregate estimates of post-harvest loss of about 10% of 2017-18's budget, but these figures lack the commodity disaggregation needed for policy and should be treated with caution. The World Resources Institute (2021) characterised India's FLW evidence as a domain of significant 'unknowns', given the scarcity of supply-chain-disaggregated primary data. The structural drivers are predominantly supply-side: India has around 8,831 cold storages (~40 Mt capacity) heavily concentrated in potato storage in Uttar Pradesh, with negligible multi-commodity coverage elsewhere. Crucially, evidence shows that on-farm grain losses can be reduced to about 2 per cent with the adoption of metal silos (Sinha & Sharma, 2004), suggesting that loss rates depend on infrastructure provision rather than agronomic inevitability. India nonetheless lacks a national consumer-stage estimate suitable for SDG 12.3.1b tracking, a measurement shortfall that is itself a policy lag.

3.4 China

China has the most comprehensive FLW profile in the bloc. A six-year field survey (2014–2018) compiled by Xue et al. (2021) estimated annual supply-chain FLW at 349 ± 4 million tonnes, about 27 per cent of food produced for human consumption, or roughly a quarter of global FLW. The largest single share occurs at post-harvest handling and storage (159 ± 3 Mt, 45 per cent), with production losses at 24 per cent (82 ± 2 Mt), distribution and retail at 11 per cent, and consumption at 17 per cent (59 ± 1 Mt). The consumption share is comparatively low, yet in absolute terms, China's consumption-stage FLW is among the world's largest. Fruits and vegetables dominate (62 per cent of total FLW; 215 ± 4 Mt), with the highest FLW rates relative to production for meat (50 per cent), oilseeds and pulses (49 per cent) and roots and tubers (32 per cent) (Sino-German Agricultural Centre, 2021). Out-of-home catering waste is independently estimated at 17-24 MT/year (~74 g per capita per meal) (Luo et al., 2024).

Three caveats matter. First, the 349 Mt figure includes pre-harvest production losses and is therefore not comparable to FLI-scope estimates for other countries. Second, a more recent 12-province survey (Lu et al., 2022) found vegetable and fruit loss rates from

production to distribution that are surprisingly low by industrialised-country standards, an unresolved tension in the evidence. Third, China's landmark Anti-Food Waste Law (2021) lacks clear quantitative reduction targets, partly because of data limitations (Jiang et al., 2023).

3.5 South Africa

South Africa's evidence base was substantially revised by the 2021 CSIR Technical Report (Oelofse et al., 2021), prepared under the Waste RDI Roadmap. Using five-year average (2014–2018) FAOSTAT supply data, CSIR estimated pre-COVID FLW at 10.3 million tonnes per annum, consistent in aggregate with earlier work but with a radically different stage distribution, such as 49 per cent at processing and packaging, 19 per cent at post-harvest handling, and 18 per cent at household consumption. This contradicts the widely cited WWF (2017) characterisation, which puts FLW at ~10 Mt (32.7 per cent of production; ~210 kg per capita) with 50 per cent at the agricultural/post-harvest stage and processing not separately identified. The discrepancy is methodological as the WWF figure appears to include inedible parts and non-food material.

Household studies add nuance. Madondo et al. (2026), in the Wallacedene settlement on Cape Town's periphery, found that 85 per cent of households were discarding edible food, chiefly vegetables, bread and fruit, driven by inadequate meal planning, restricted access to refrigeration, irregular income and limited preservation knowledge. Cold-chain failure is widely documented. Cold Chain SA (2026) estimates that failures at the Cape Town port alone cost R350 million in export losses annually. South Africa's dual-economy structure, advanced commercial cold chains alongside underdeveloped township and informal-market infrastructure, produces a bimodal pattern rarely captured in national aggregates.

3.6 Egypt

Egypt's FLW is economically significant and politically sensitive. A wheat value-chain study (Yigezu et al., 2021) found combined losses of about 20.6 per cent of supply (~4.4 Mt), concentrated in marketing (4.27 per cent), storage (4.00 per cent) and harvest (3.93 per cent), with open-air government 'Shona' stores lacking protection from birds, rodents, weather and insects identified as a key weakness. Bread is a politically sensitive staple. The government spends on the order of USD 3.7 billion annually on bread subsidies, and losses in the subsidised system are both an economic and a political vulnerability (FAO, 2024). FAO-Egyptian Food Bank reporting (2023) cites markedly higher figures, 45-55 per cent of vegetable/fruit production, ~91 kg of household waste per capita, and ≥60 per cent of edible food discarded on holidays. Egypt is nonetheless one of only 21 countries to include FLW reduction in its Nationally Determined Contribution, political commitment running ahead of the evidence base.

3.7 Ethiopia

Ethiopian FLW is heavily concentrated at post-harvest and on-farm storage stages, reflecting limited infrastructure and reliance on smallholder agriculture. Teferra (2022) reports commodity post-harvest losses of 23 per cent for barley, 15 per cent for maize, 14 per cent for wheat, 27 per cent for sorghum, 25 per cent for potatoes, 21 per cent for dry beans/peas, and 17 per cent for sesame, with an annual cost on the order of USD 1.2 billion. The national Post-Harvest Management Strategy (Republic of Ethiopia, 2024) reports cereals at ~25 per cent, fruits and vegetables at ~38 per cent, meat at ~23–40 per cent, and milk at ~30 per cent, with total post-harvest loss valued at up to USD 6.2 billion. The first nationally representative FAO & Ethiopian Statistics Service (2023) provided FLI-compatible estimates, including maize at 17.6 per cent and wheat at 14.1 per cent of production.

These rates are staggering for food security; Ethiopia's maize loss rate alone exceeds the minimum caloric intake gap for its food-insecure population. Unlike China or South Africa, where FLW is partly a by-product of abundance, Ethiopian FLW is almost wholly a consequence of structural deficits in infrastructure, technology and smallholder support. The implication for policy is fundamental: interventions appropriate for Ethiopia (hermetic storage bags, rural access roads, mobile market information) are categorically different from those appropriate for higher-income members.

Table 1: Status of FLW evidence across BRICS countries

S. No.	BRICS countries	Status of FLW	FLW points in the value chain	Source
1.	Brazil	Grain: 20% of production	50% of total grain losses in storage	Costabile, 2017
		Fruits and Vegetables: 30-35% of production	Production to post-harvest	Freire Junior & Soares, 2020
		Per capita per annum loss and waste: 427 kg/capita/year, of which 327 kg/capita/year is edible waste	-	Dal'Magro & Talamini, 2019
2.	Russia	17-17.9 million tonnes	Storage, retail and consumption	Foodbank Rus, 2019; Zinina et al., 2024
		Per capita per annum loss and waste: 119-123 kg/capita/year	-	-
		National food losses: 0.6% of production and 30-40% of total production	-	Rosstat as reported in Galaktionova et al., 2022; SKOLKOVO, 2019

S. No.	BRICS countries	Status of FLW	FLW points in the value chain	Source
3.	India	Food: 3.89-5.92%; Pulses: 5.65-6.74%; Oilseeds: 5.96-6.96%; Fruits: 6.02-15.05%; Vegetables: 4.97-11.61%	Post-harvest losses	NABCOMS, 2022
		Average national loss: Rs. 152790 Crore and 10% of the 2017-18 budget	-	NABCOM, 2022; Devi & Devi, 2025
4.	China	Average national loss: 349 ± 4 million tonnes	Production: 24% (82 ± 2 MT); Post-harvest handling and storage: 45% (159 ± 3 MT); Consumption: 17% (59 ± 1 MT);	Xue et al. (2021); Sino-German Agricultural Centre, 2021
		Food: 27% of production; Meat: 50% of production; Oilseeds: 49% of production; Roots and Tubers: 32% of production; Fruits and Vegetables: 62% of total FLW		
		Out of home catering waste: 17-24 MT	Retailing and Consumption	Luo et al., 2024
5.	South Africa	Average national loss: 10-10.3 MT/year; 32.7% of production	Post-harvest handling: 19%; Processing and packaging: 49%; and Household consumption: 18%	Oelofse, 2021; WWF, 2017
		Port losses during exports: R350 million/ year	-	Cold Chain SA, 2026
6.	Egypt	Wheat value chain losses: 20.6% of supply	Harvesting: 3.93%; Storage: 4%; and marketing: 4.27%	Yigezu et al., 2021
		Fruit and vegetables: 45-55% of production	-	FAO-Egypt Food Bank Report, 2023
7.	Ethiopia	Annual national loss: 1.2 billion USD Barley: 2.3%; Maize: 15%; Wheat: 14%; Sorghum: 27%; Potato: 25%; Peas: 21%, and Sesamum: 17%	On-farm storage and post-harvest	Teferra, 2022
		Annual national loss: 6.2 billion USD Cereals: 25%; Fruits and Vegetables: 38%; Milk; 30% and Meat: 23-40%	-	Postharvest Management Strategy of Ethiopia, 2024

S. No.	BRICS countries	Status of FLW	FLW points in the value chain	Source
8.	Saudi Arabia	Annual Food Loss and Waste: 33.1% (Food Loss: 14.2% and Food Waste: 18.9%) Fruits and Vegetables: 39.6%; Rice: 33.6%; Wheat: 29.7%; Dates: 21.4%; Fish: 33%; Poultry: 29.1%; and Meat: 31.3%	-	Alshabanat et al., 2021
9.	United Arab Emirates (UAE)	Annual Food Waste: 3.27 MT or USD 3.7 billion per year	Wastage of prepared food:38%; Food waste as a % of household waste; 40%	Ferrelly Mitchell, 2024
10.	Indonesia	Per capita per annum loss and waste: 115-184 kg/capita/year; Vegetables: 62.8%	Production to Distribution: 45% (Decreasing) and Consumption: 55% (Increasing)	BAPPENAS, 2021
		Annual Food Loss and Waste: 20.94 MT or USD 14-35 billion	-	Aaron, & Budiman, 2025
11.	Iran	Annual Food Loss and Waste: 18-26% of production	Post-harvest, distribution, retail, restaurant, and Household	Sokootifar, 2017

Source: Author's compilation

3.8 Saudi Arabia

Saudi Arabia presents a high-income, import-dependent profile with substantial losses at both ends of the chain. The most cited primary study (Alshabanat et al., 2021) estimates overall food loss at 14.2 per cent and food waste at 18.9 per cent, for a combined 33.1 per cent (2016 baseline). By product, combined FLW reaches 39.6 per cent for fruit, 39.5 per cent for vegetables, 33.6 per cent for rice (the most wasted commodity), 33 per cent for fish, 31.3 per cent for meat, 29.7 per cent for wheat, 29.1 per cent for poultry and 21.4 per cent for dates. Production-stage loss and consumption-stage waste both feature prominently. The drivers are characteristically high-income and behavioural, generous hospitality norms, buffet over-serving, large portions and abundance culture, alongside supply-chain and storage weaknesses for perishables. A second national survey was underway at the time of writing, reflecting an active measurement agenda under the national programme.

3.9 United Arab Emirates

The UAE's profile is determined by its status as a high-income, food-import-dependent economy with an exceptionally large food-service sector. Farrelly Mitchell (2024) reported that an estimated 3.27 million tonnes of food are wasted annually, costing the UAE economy approximately $3.5 billion per year, according to the Ministry of Climate Change and Environment. In Dubai alone, 38% of prepared food is wasted, rising to 60% during Ramadan. Food alone makes up about 40% of the average household's waste. UAE waste is concentrated almost entirely at the food-service and household stages; supply-chain losses are minimal given sophisticated logistics. The UAE is among the small group of countries embedding FLW reduction in its Nationally Determined Contributions (NDC) and its Net Zero 2050 strategy, and the Abu Dhabi Global Food Security Summit, referenced in the Kazan Declaration, signalled its ambition to lead food-security governance within the bloc. Its first national FLW baseline study was launched in 2025; institutionally, its architecture is among the most advanced in the bloc, even as evidence on which interventions best reduce culturally rooted waste remains limited.

3.10 Indonesia

Indonesia's situation combines a large and rising waste burden with a governance deficit. The BAPPENAS national study (2021) analysed 146 commodities over 2000–2019 and found total FLW of 115-184 kg per capita per year, with the loss share (production to distribution) declining from 61 to 45 per cent and the waste share (consumption) rising from 39 to 55 per cent, with vegetables the most inefficient category (62.8 per cent lost). Aaron & Budiman, 2025 reported over 20.94 Mt of food losses annually, enough to feed 29-47 per cent of the population, valued at IDR 213–551 trillion (USD 14–35 billion) and releasing ~85 Mt CO□-equivalent. Business-as-usual projections put annual FLW above 100 Mt by 2045, the most alarming trajectory in the bloc, reflecting rapid urbanisation, food-service growth and inadequate cold chain. Despite a 2024 roadmap targeting a 75 per cent reduction in FLW by 2045, only around 29 local governments have implemented any FLW policy, mostly through non-enforceable circular letters, a political-economy gap that is more acute than the raw data suggest.

3.11 Iran

Iran is the least well-documented full member, reflecting data-reporting constraints and sanctions' impact on cold-chain investment. The most detailed primary evidence comes from a COMCEC presentation by the Ministry of Jihad-e-Agriculture (Sokootifar, 2017), estimating regional FLW at roughly 18-26 per cent of production, concentrated at post-harvest, distribution, retail, restaurant and household stages, with fruits and vegetables, bread and rice the most affected; inadequate cold storage and refrigerated transport are the central structural deficits. Peer-reviewed evidence is largely confined to household bread

waste in Shiraz (Ghaziani et al., 2022), at about 1.8 per cent (1.7 per cent traditional; 2.5 per cent non-traditional bread), linked to dietary patterns, socio-economic status and the cultural stigmatisation of bread wastage. Iran's National Great Food Safety and Food Security Council (2004) mandates loss reduction and targets a 10 per cent annual cut in agricultural losses, but Iran's absence from both FLI and FWI tracking means progress cannot be benchmarked internationally.

3.12 Cross-cutting patterns and the measurement problem

The country's FLW evidence reveals a consistent gradient. Lower-income members (Ethiopia, Egypt, rural India, Iran) lose food disproportionately at post-harvest and storage stages, driven by infrastructure deficits. Middle-income members (China, South Africa, Brazil, Indonesia) show significant processing and distribution losses, reflecting incomplete cold-chain development and supply-chain fragmentation. Higher-income members (UAE, Saudi Arabia, and Russia at consumption) waste relatively more at the food-service and household stages. This aligns with the original FAO (2011) observation that developing countries lose >40 per cent at post-harvest and processing, while developed countries lose >40 per cent at retail and consumer levels. Yet the gradient is not mechanically predictable. South Africa's 49 per cent processing-and-packaging share (Oelofse, 2021) defies the assumption that middle-income FLW is dominated by post-harvest or consumer stages, and Indonesia's trajectory shows urbanisation amplifying consumer waste faster than policy can respond.

Further, measurement heterogeneity undermines naive comparison. China's 349 Mt (all stages, including pre-harvest) is not comparable with Russia's $\sim$17.9 Mt (storage-to-consumption only). South Africa's 10.3 Mt (Oelofse, 2021) is methodologically inconsistent with the $\sim$210 kg per capita figure from WWF (2017), despite both being South African studies. India's NABCONS (2022) covers post-harvest to retail but excludes consumer-stage waste, making it incomparable with FWI-based rankings. Thus, practically the headline FLW statistics for the bloc must be read with explicit methodological caveats rather than treated as a precise league table.

4. The Key Drivers of Food Loss and Waste

Where Section 3 maps how much food is lost and where, this section asks why. Drivers are reported as each country's primary sources; no driver has been inferred beyond the cited evidence. A general root-cause framework (Dora et al., 2021) (Figure 5 and 6) corroborates the stage-wise pattern: in less-developed contexts, losses cluster around poor infrastructure, inadequate cooling and storage, pest and mould damage, inferior harvesting equipment and poor road networks, whereas in developed contexts they cluster around cosmetic and quality standards, over-purchasing, poor demand forecasting, date-label confusion and behavioural waste at the household and food-service stages.

4.1 Drivers by country

Brazil: Pre-consumer drivers include mechanical damage from rough handling, inadequate packaging, non-refrigerated transport on poorly maintained roads, plant disease, and high ambient temperatures, concentrated in fruits, vegetables, cereals, and roots. Consumer drivers are household over-purchasing, over-preparation and large portions, avoidance of leftovers and inadequate conservation, aggravated by a cultural valuing of abundance and by economic crises (Dal'Magro & Talamini, 2019; Henz & Porpino, 2017).

Russia: A weak enabling environment prevails: no dedicated FLW legislation and low research funding, leading to losses that are poorly measured and managed. Supply-chain inefficiency, demand variability, inadequate inventory, storage and refrigeration capacity (especially in the regions), on-farm losses from poor storage and weather, and aesthetic/transit rejections compound the problem; the VAT and tax structure historically made landfilling cheaper than donation (Petrunina et al., 2023; Filimonau & Ermolaev, 2021; Galaktionova et al., 2022).

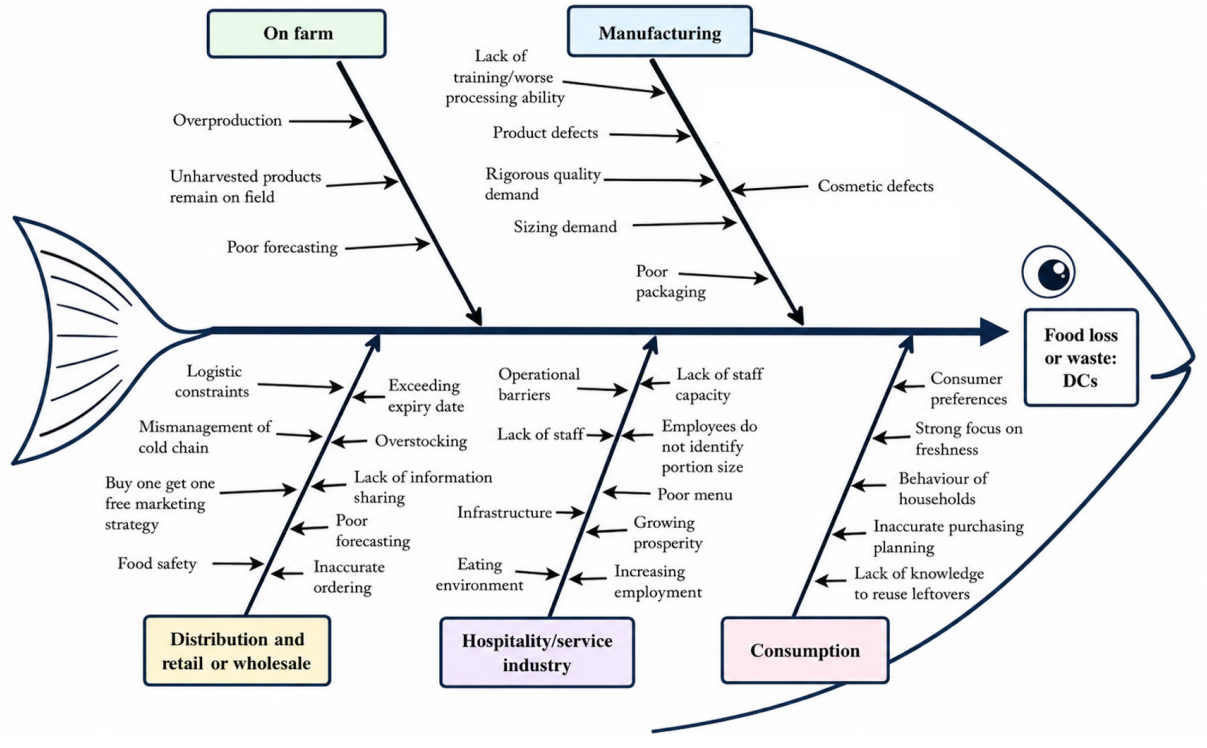


Figure 5: Root cause analysis of food loss and waste in developed countries (DC)
Source: Adapted from Dora et al., 2021

India: Post-harvest losses are driven by improper handling, faulty packaging and stacking, spillage and mechanical damage during harvesting, threshing, loading and transport; inadequate or absent cold storage and refrigerated vehicles; pest, rodent, mould and weather damage during drying and storage; poor market infrastructure, hygiene and

sanitation (especially for meat and perishables); high storage-rental costs; and a general deficit of post-harvest infrastructure (NABCONS, 2022).

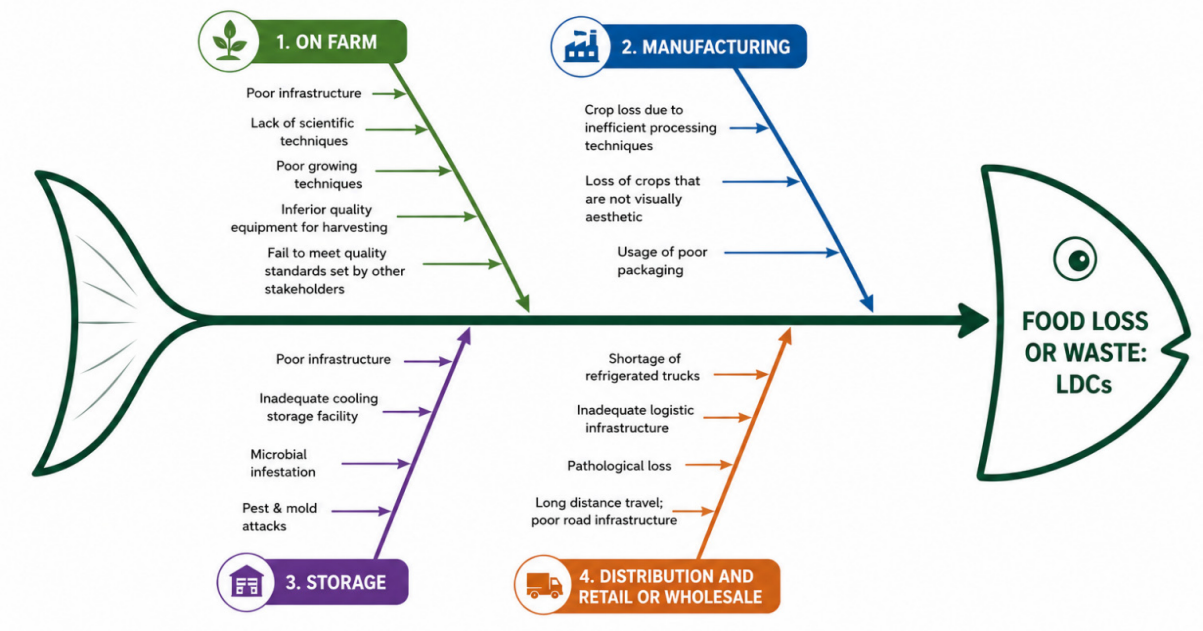


Figure 6. Root cause analysis of food loss and waste in less developed countries
Source: Adapted from Dora et al., 2021

China: On the loss side, insufficient investment in infrastructure and equipment (e.g., poor drying facilities), lack of distribution cold chain, non-standardised manual and mechanical operations, on-farm grain-storage losses to rodents, insects and moulds, and strict cosmetic standards with 'consumer picking' damage at retail. On the waste side, household behaviour, date-label misinterpretation, food-storage knowledge, household composition, age, income, and urban-rural differences, together with high out-of-home (catering) consumption (Lu et al., 2022; Luo et al., 2020; Li et al., 2023) are the major drivers.

South Africa: Loss and waste concentrate at processing and packaging (49 per cent) and post-harvest handling (19 per cent), driven by supermarket-dominated chains imposing strict size and appearance standards, with rising household waste (18 per cent); production losses are comparatively low due to sophisticated commercial farming (Oelofse, 2021).

Egypt: In the wheat chain, the highest losses occur at marketing and storage, especially in open-air 'Shona' stores, plus field losses from sub-optimal management and losses in harvesting, bundling, transport, and threshing. For horticulture, determinants include delayed harvesting, maturity-accelerating chemicals, poor packing, long distance to market and poor storage/transport, with consumer waste rising sharply during festivals and Ramadan (Yigezu et al., 2021; FAO Egypt and EFB, 2023).

Ethiopia: Drivers operate at three levels (Republic of Ethiopia, 2024; Teferra, 2022). Micro:

poor handling, consumer behaviour and weak planning. Meso: lack of equipment and good practices, weak coordination between actors, inadequate infrastructure, retailer-imposed quality standards, limited storage and transport, too few or sub-standard wholesale and retail facilities, and date-label confusion. Macro: an absent enabling environment for coordination and investment, and inadequate policy and regulatory frameworks.

Saudi Arabia: High per-capita waste in a high-income, import-dependent setting, driven by cultural and behavioural factors, generous hospitality, buffet over-serving, large portions and abundance norms, across wheat, rice (the most wasted), dates, poultry, vegetables, fruit, fish and meat (Alshabanat *et al.,* 2021).

United Arab Emirates: Predominantly consumer and behavioural waste, over-purchasing and over-preparation, an abundant buffet and hospitality culture, and waste peaking during Ramadan and social occasions are a few of the key drivers. However, more disaggregated national-level figures are expected from the 2025 baseline study (National Food Loss and Waste Initiative; Gulf Business, 2025).

Indonesia: Direct causes include the absence of Good Handling Practices, insufficient storage conditions, technological limitations, poor packaging, poor harvesting timing and technique, overproduction, misinterpretation of date labels, excess portions, and inadequate preparation. Indirect drivers include weak information and education for food workers and consumers, market quality standards and consumer preferences, an inefficient supply chain, limited access to infrastructure and capital, market price, limited purchasing power, and the absence of FLW regulation (BAPPENAS, 2021).

Iran: Household bread waste is linked to dietary patterns and socio-economic status, with bread type (non-traditional exceeding traditional), domestic storage methods, economic conditions, bread-quality improvement, and the cultural stigmatisation of bread wastage all contributing; broader supply-side shortcomings in the bread chain are documented nationally (Ghaziani et al., 2022).

4.2 A driver typology for the bloc

Aggregating across members, three driver clusters emerge. The first is an infrastructure-and-technology cluster, cold-chain gaps, poor storage, pest and microbial damage, weak roads and transport, dominant in Ethiopia, India, Iran, Brazil and the loss side of China and Egypt. The second is a market-and-standards cluster: supermarket cosmetic standards, demand variability, weak forecasting, date-label confusion, and inefficient supply chains, prominent in South Africa, Russia, China, Indonesia, and Egypt. The third is a behavioural-and-cultural cluster: over-purchasing, over-preparation, abundance norms, and festival or Ramadan peaks, dominant in the UAE, Saudi Arabia, the consumer side of Egypt, and increasingly in Brazil, China and Indonesia as incomes rise. A fourth, cross-cutting enabling-environment driver, the absence of dedicated FLW law, measurement systems, weak enforcement of laws even if they existed, fiscal incentives, and inter-ministerial

coordination recurs in Russia, Iran, Indonesia, and China. This typology is the analytical bridge to the research question 3: each cluster calls for a qualitatively different response, and members strong in one cluster are frequently weak in another, the structural basis for cooperation developed in Section 6.

5. Best Practices, Institutions and Strategies

This section reviews what each member is doing regarding FLW, classifying interventions into three types: binding legislation; government strategies, policies, and programmes; and voluntary, NGO, or industry initiatives. It then distils the transferable best practices that recur across members.

5.1 Institutional mechanism by country

Brazil has no dedicated FLW law, but its National Solid Waste Policy mandates municipal organics management, and food security is anchored in LOSAN and the National Policy for Food and Nutrition Security (PNSAN). The flagship instrument is the 2nd Intersectoral Strategy for the Reduction of Food Loss and Waste (2022–2030), approved on 29 September 2025 and coordinated by the inter-ministerial chamber CAISAN across three ministries, with actions spanning production, distribution and consumption. Voluntary action includes food banks, Save Food Brasil and UNEP-supported circular-economy work. Brazil's On-Farm Food Recovery experience, direct procurement of surplus produce, and grant funding for recovery infrastructure are documented in the Global Food Donation Policy Atlas.

Russia has no dedicated FLW law or national strategy; a 2020 amendment permits tax-free food donation up to 1 per cent of company revenue, though VAT remains a disincentive. The operative response is NGO-led. Food Bank Rus and food-sharing platforms (Foodsharing.Russia, We Save Food, EatMe) redistribute surplus from producers and retailers.

India has no dedicated FLW law; FSSAI food-safety regulations and surplus-food-donation guidelines provide the legal basis. The principal programme is the Pradhan Mantri Kisan SAMPADA Yojana (PMKSY), including the Integrated Cold Chain and Value Addition Infrastructure Scheme targeting post-harvest loss. Voluntary action runs through FSSAI's 'Save Food, Share Food' initiative and the Indian Food Sharing Alliance (IFSA).

China is a global first-mover, enacting the Anti-Food Waste Law (effective 29 April 2021) (Table 2), whose 32 articles impose duties, incentives and penalties on caterers, takeaway platforms, supermarkets and media (fines up to ¥10,000, rising to ¥50,000 for repeat offenders and ¥100,000 for 'binge-eating' content). The 2024 Food Security Law reinforces loss reduction. National action targets production, transport and storage losses, and the 'Clean Plate' / Operation Empty Plate campaign addresses consumer behaviour.

The law's key limitation is the absence of a quantitative reduction target, which constrains benchmarking (Jiang et al., 2023).

South Africa has no dedicated FLW law but addresses it under the NEMWA waste framework, with a National Food Loss and Waste Strategy and Prevention Guideline gazetted by the DFFE in 2023, committing to halve FLW by 2030 in line with SDG 12.3. The Consumer Goods Council's South African Food Loss and Waste Voluntary Agreement and food banks such as FoodForward SA represent a notable public–private model.

Egypt has no dedicated FLW law; its main vehicle is an FAO–Ministry of Agriculture (MALR) Food Loss and Waste Reduction project (post-harvest training and awareness), linked to Egypt Vision 2030 and Haya Karima rural development. The Egyptian Food Bank and the annual FAO-EFB Ramadan anti-waste behaviour-change campaign (since 2020) anchor voluntary action.

Ethiopia's flagship is the National Post-Harvest Management Strategy (PHMSE) 2024–2030 (endorsed 14 April 2024), covering grain, horticulture, livestock and fish and aligned with the AU Malabo commitments and SDG 12.3, complemented by FAO/Swiss-funded post-harvest projects and a FOLU–MoA FLW measurement partnership.

Saudi Arabia's response is led by the General Food Security Authority (SAGO) (Table 2) through the National Program to Reduce Food Loss and Waste ('Li Tadum'), operating since 2018 under Vision 2030 and the National Transformation Programme, with an FLW Index baseline (2019), a National Observatory and a second field survey from 2025. Awareness campaigns ('The Waste Moment') and food banks (Eta'am / Saudi Food Bank) support implementation; a legislative framework is being developed within the programme.

Without a dedicated federal FLW law, the UAE acts through ne'ma, the National Food Loss and Waste Initiative (target: halve FLW by 2030), which launched the first national baseline study in 2025. The ne'ma Food Rescue Programme, the UAE Food Bank, and hotel partnerships (e.g., Winnow AI kitchen analytics, Green Ramadan) drive food-service interventions.

Indonesia's Waste Management Law and Government Regulation cover household-type waste but are not FLW-specific. The Bappenas National FLW Study and roadmap (2021) set out 45 strategies across five policy directions, behaviour change, supply-chain efficiency, infrastructure, regulation/funding and institutional coordination, embedded in the national medium-term development plan and Low Carbon Development Initiative. Food-sharing networks and the GRASP 2030 / IBCSD private-sector platform supply voluntary momentum.

Iran has no dedicated FLW law; its operative measures are bread-subsidy reform and a smart (electronic) bread-card system to curb bread waste, a national bread-quality improvement

policy (2010), and food-security and self-sufficiency plans, with no nationally documented FLW NGO programme.

Table 2. FLW reduction mechanisms in the BRICS member countries

Country	Binding law	Government strategy/ programme	Voluntary / NGO / industry
Brazil	No dedicated FLW law; Solid Waste Policy; LOSAN	II Intersectoral Strategy 2022–30 (CAISAN, 3 ministries); part of PNSAN	Food banks, SaveFood Brasil; UNEP circular-economy work
Russia	No FLW law; 2020 tax-free donation up to 1% of revenue (VAT a disincentive)	None at the national level	Food Bank Rus; food-sharing (Foodsharing.Russia, We Save Food, EatMe)
India	No FLW law; FSSAI safety & donation guidelines	PMKSY incl. Integrated Cold Chain & Value Addition Scheme	FSSAI 'Save Food, Share Food'; Indian Food Sharing Alliance
China	Anti-Food Waste Law (2021); Food Security Law (2024)	Action on production/ transport/storage; 'Clean Plate' campaign	Food banks under government guidance; media campaigns
South Africa	No FLW law; NEMWA framework (strategy gazetted under it)	National FLW Strategy / Guideline (DFFE, 2023); halve by 2030	CGCSA Voluntary Agreement (2020); FoodForward SA
Egypt	No dedicated FLW law	FAO–MALR FLW project; linked to Vision 2030 / Haya Karima	Egyptian Food Bank; FAO–EFB Ramadan campaign (since 2020)
Ethiopia	No FLW law (food-safety standards apply)	Post-Harvest Management Strategy (PHMSE) 2024–30; AU Malabo / SDG 12.3	FAO/Swiss post-harvest project; FOLU–MoA measurement
Saudi Arabia	No FLW law (framework in development)	SAGO National Program ('Li Tadum') since 2018; Index, Observatory, 2025 survey	'The Waste Moment'; Eta'am / Saudi Food Bank
UAE	No federal FLW law (some emirate rules)	ne'ma National Initiative (halve by 2030); 2025 baseline	ne'ma Food Rescue; UAE Food Bank; Winnow / Green Ramadan
Indonesia	Waste Law; GR (not FLW-specific)	Bappenas FLW study & roadmap (2021): 45 strategies; in RPJMN / LCDI	Food-sharing / food banks; GRASP 2030 / IBCSD
Iran	No FLW law	Bread-subsidy reform & smart bread-card; bread-quality policy (2010)	No nationally documented FLW NGO programme

Sources: Official government sources, FAO/UN, and primary records compiled in the project corpus. Several members pursue FLW reduction indirectly through food-donation, cold-chain, waste-management and food-security frameworks rather than a single named 'FLW law'.

5.2 Transferable best practices

Across these eleven responses, number of practices stand out as effective and, crucially, transferable between members at different development levels:

- Loss-reducing storage technology. Metal silos and hermetic storage bags cut on-farm grain losses dramatically, from ~20 per cent to below 2 per cent in Indian demonstrations and are directly relevant to Ethiopia, Iran, Egypt and Brazil's grain belt.
- Cold-chain and value-addition infrastructure. India's Integrated Cold Chain Scheme and Brazil's recovery-infrastructure grants show how targeted public investment, including blended finance and competitive grants, can expand capacity for perishables, the binding constraint in Ethiopia, Iran, India, Egypt and South Africa's informal economy.
- Binding legislation with enforcement. China's Anti-Food Waste Law is the bloc's clearest legislative model; its principal lesson, the need for quantitative targets and measurement to make enforcement meaningful, is as instructive as the statute itself.
- Intersectoral national strategies. Brazil's CAISAN-coordinated strategy, South Africa's DFFE strategy, Ethiopia's PHMSE, Indonesia's Bappenas roadmap and Saudi Arabia's SAGO programme demonstrate the value of inter-ministerial coordination and a named coordinating body, precisely the gap in Russia and Iran.
- Voluntary agreements and food-bank networks. South Africa's industry Voluntary Agreement, and the food banks operating in nearly every member (Food Bank Rus, EFB, FoodForward SA, UAE Food Bank, Eta'am, IFSA), provide ready vehicles for surplus redistribution; their effectiveness depends on enabling donation law and tax treatment, an area where the Global Food Donation Policy Atlas offers comparative design guidance.
- Behaviour-change and food-service tools. Ramadan and festival campaigns (UAE, Egypt, Saudi Arabia), 'Clean Plate' (China), and AI kitchen analytics (UAE) target consumer and food-service waste, which is higher among higher-income members and rising across the middle-income group.
- Demand-side fiscal and price tools. Iran's smart bread-card and subsidy reform, and Russia's (partial) donation tax relief, illustrate how price signals and fiscal design shape waste, with the cautionary lesson that VAT and tax structures can make wasting cheaper than donating unless deliberately corrected.

6. The BRICS Platform as a Cooperative Opportunity

The preceding sections answer the three research questions and, in doing so, reveal the answer to the fourth. The very heterogeneity that makes uniform FLW targets inappropriate is the foundation of an unusually strong complementarity. Members are rarely weak in the same place at the same time: where one lacks cold-chain technology, another has

surplus capacity; where one wastes at the consumer stage, another loses at storage; where one has pioneered legislation, another has pioneered measurement. The BRICS platform, and India's 2026 chairship in particular, offer institutional channels through which these complementarities can be converted into mutual benefit.

6.1 Structural complementarity

Three complementarities stand out. The first is between surplus producers and import-dependent members: Russia (the world's largest wheat exporter) and Brazil (a leading exporter of grains, beef and sugar) supply markets that the UAE, Saudi Arabia and Egypt depend on for imports. Reducing storage and transit losses among exporters directly improves importers' food security, creating a shared interest in cold-chain and grain-storage quality on both sides. The second is between technology leaders and infrastructure-deficient members: China's cold-chain and grain-milling modernisation, India's metal-silo and digital-market experience, and South Africa's and Brazil's commercial logistics can be transferred to Ethiopia, Iran, rural India, and Egypt, where the binding constraint is precisely the infrastructure the leaders have built. The third is between legislators and experimenters: China's Anti-Food Waste Law, Brazil's intersectoral strategy, South Africa's voluntary agreement, Saudi Arabia's observatory model and the UAE's food-rescue programme constitute a menu of tested policy designs from which members without dedicated FLW frameworks, Russia, Iran, and Indonesia at the national level, can learn.

6.2 A BRICS FLW measurement harmonisation protocol

The single most consequential cooperative action would be the adoption of a BRICS FLW Measurement Harmonisation Protocol, applying the FAO FLI methodology to supply-chain stages and the UNEP FWI methodology to consumer stages, with baseline estimation required as a precondition for any quantitative commitment. The case for it is established directly by Section 3: cross-country comparisons are currently meaningless due to scope and method differences, and several members (India, Russia, Iran, Egypt) lack any FWI-suitable consumer-stage estimate. A harmonised protocol would allow members with mature measurement capacity (Brazil, China, South Africa, Indonesia, Saudi Arabia) to mentor those building it (Ethiopia's FAO/ESS pilot, the UAE's and Saudi Arabia's 2025 baselines, India's consumer-stage gap), turning a fragmented evidence base into a comparable one and giving the bloc a credible foundation for joint targets.

6.3 Technology and knowledge transfer/ exchange through South–South cooperation

BRICS is, at its core, a South–South cooperation platform, and FLW is an unusually good fit for that model: the technologies that matter, hermetic storage, metal silos, low-cost cold chain, digital market-information systems, are mature, affordable and proven within the bloc rather than imported from the global North. The Brazil-FAO trilateral cooperation

programme (which underpins Brazil's sustainable school-feeding work) and India's digital agricultural market platforms (e-NAM) are existing templates for member-to-member transfers. A standing BRICS knowledge exchange, demonstration farms, training of post-harvest extension workers, and shared technical guidelines would enable lower-income members to leapfrog rather than rediscover solutions that India, China, and Brazil have already field-tested.

6.4 Financing through the New Development Bank

The infrastructure deficits that drive loss in Ethiopia, India, Iran, Egypt and South Africa's informal economy require capital, and the bloc already has a dedicated financing vehicle in the form of the New Development Bank (NDB). Directing NDB lending and blended-finance facilities toward cold-chain corridors, grain-storage modernisation, rural access roads, and recovery infrastructure would address FLW at its most expensive points while advancing the NDB's sustainable development mandate. The competitive-grant and public-private-partnership models documented for on-farm food recovery (e.g., Argentina's programme with the Inter-American Development Bank, and the UK Resource Action Fund) offer design precedents that the NDB could adapt for member states.

6.5 Trade, standards and redistribution networks

Because much loss occurs at the interface between members, in export storage, transit and quality rejection, harmonised quality and cosmetic standards, shared cold-chain certification, and a possible BRICS grain-quality certification scheme would reduce the aesthetic and transit rejections that several studies identify as drivers (Russia, China, South Africa, Egypt). On the redistribution side, the food banks operating in almost every member state could be linked into a BRICS surplus-redistribution network supported by a common model donation law, drawing on comparative best practices from the Global Food Donation Policy Atlas (liability protection, date-label clarity, tax incentives, and the food-recovery hierarchy).

6.6 An institutional home and the 2026 window

These actions need a home. Embedding FLW within the BRICS Agriculture Working Group, anchoring it to the food-security ambitions signalled in the Kazan Declaration and the Abu Dhabi Global Food Security Summit, and using India's 2026 chairship to launch a measurement protocol and a knowledge-and-finance package would give the agenda momentum. The guiding principle should be differentiated obligations: rather than a uniform percentage-reduction target, members would commit to actions calibrated to their dominant loss stage, measurement capacity, and structural root cause. Framed this way, differentiation is not a political concession but a scientific necessity, and it makes ambition more, not less, achievable by directing each member's effort to where the evidence shows it will have the greatest effect.

7. Policy Implications and Priority Interventions

The evidence supports a central argument: stage-specific, evidence-grounded FLW policy is the only technically defensible approach across the BRICS. Uniform percentage-reduction targets are valuable as global aspirations but inadequate as the basis for national or multilateral design, for four reasons. First, the dominant loss stage differs by more than 40 percentage points across members; applying the same consumer-waste target to Ethiopia (where post-harvest loss is the emergency) and the UAE (where consumer waste is the problem) would misdirect effort in at least one of them. Second, measurement heterogeneity means headline estimates are not yet comparable, so a harmonisation protocol must precede quantitative commitments. Third, the primary drivers differ fundamentally: infrastructure deficits (Ethiopia, India, Iran), legislative and coordination gaps (Russia, Iran, Indonesia), non-binding laws (China), cold-chain deficiency (South Africa, Brazil) and cultural norms (Indian, UAE, Saudi Arabia, Egypt), each requiring a different intervention. Fourth, differentiated obligations give the bloc a technically defensible basis for calibrated, rather than uniform, commitments.

8. Evidence Gaps and Future Research Agenda

The corpus exposes four critical deficiencies. First, consumer-stage data are absent or methodologically weak for the majority of members, India, Russia, Ethiopia, Indonesia, and Iran, creating a fundamental gap in SDG 12.3.1b tracking. Second, stage-specific, commodity-level estimates for the distribution and retail stages are rarely available for any member, despite these being significant loss points in cold chains. Third, Egypt and Iran have essentially no peer-reviewed, primary-data FLW studies in the international literature, making independent assessment impossible. Fourth, gender-disaggregated FLW data are entirely absent from the reviewed sources, a systematic blind spot, given that women manage much of the post-harvest handling, storage and household food management in Ethiopia, India and Egypt, so gender-blind analysis will misidentify the most effective points of leverage.

A future research agenda follows directly: (i) nationally representative consumer-stage surveys harmonised to the FWI in India, Russia, Indonesia, Iran and Ethiopia; (ii) primary commodity studies at the distribution and retail stages across the bloc; (iii) peer-reviewed primary measurement for Egypt and Iran; (iv) gender-disaggregated FLW data collection embedded in national surveys; and (v) evaluation studies of the relative cost-effectiveness of interventions, storage technology, cold chain, legislation, behaviour change, to inform the differentiated commitments proposed in Section 6.

9. Conclusions

This critical review of FLW evidence across the eleven BRICS full members yield five substantive conclusions. First, the evidence base is fragmentary, methodologically heterogeneous and in several cases built on estimates of doubtful provenance; widely cited headline statistics should be used only with explicit caveats, and researchers should engage with primary evidence rather than reproducing comparisons that imply false precision. Second, the developmental gradient in stage distribution is robust; lower-income members lose food upstream, higher-income members waste it downstream, but it is not deterministic, as South Africa's processing-dominated profile and Indonesia's rising consumer waste show. Third, institutional responses already span the full toolkit, from China's binding law to Brazil's intersectoral strategy to the UAE's food-rescue programme, but they are uneven and, in Russia and Iran, largely absent at the national level. Fourth, the absence of consumer-stage and gender-disaggregated data is a systematic weakness that limits both national policy and any future joint commitment. Fifth, and most importantly for the bloc's agenda, the heterogeneity documented here is not an obstacle to cooperation but its rationale: surplus and deficit, technology and need, legislation and measurement are distributed across members in complementary ways.

The answer to the headline question is therefore affirmative and specific. The BRICS platform can deepen engagement, collaboration and partnership for mutual benefit through a measurement harmonisation protocol, South–South technology and knowledge transfer, New Development Bank financing of loss-reducing infrastructure, harmonised standards and a linked redistribution network, all housed within the BRICS Agriculture Working Group and a principle of differentiated, stage-specific obligations. India's 2026 chairship is the moment to institutionalise this approach, one that does not weaken the ambition to halve food waste and cut losses, but strengthens it by directing each member's effort to where the evidence shows it will matter most.

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