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REDUCING FOOD LOSS AND WASTE IN CITIES

Legal Pathways for Sustainable and Inclusive Urban Development

Reducing Food Loss and Waste in Cities: Legal Pathways for Sustainable and Inclusive Urban Development

First published in Nairobi in 2026 by UN-Habitat

United Nations Human Settlements Programme (UN-Habitat) P. O. Box 30030, 00100 Nairobi KENYA

Tel: 254-020-7623120 (Central Office)

www.unhabitat.org

Acknowledgements

Principal author: Xiyue Wang

Contributors: Anne Amin, Norah Katunga, Samuel Njuguna, Sapna Singh

Peer-reviewers (UN-Habitat): Francesco Bucci and Grace Githiri

Peer reviewers (FAO): Edoardo Desiderio

Design and layout: Jean Robert Gatsinzi

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Please cite this publication as: UN-Habitat (2026), Reducing Food Loss and Waste in Cities: Legal Pathways for Sustainable and Inclusive Urban Development.

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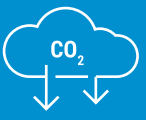
Every day, cities around the world discard vast quantities of edible food, while millions of urban residents struggle to access adequate nutrition (UNEP, 2024). Food loss and food waste occur at different stages of the supply chain and require distinct policy and legal responses: losses are concentrated in production, storage and distribution, while waste occurs primarily at retail and consumption stages.

In 2022, approximately 13.2 per cent of food was lost before reaching markets (FAO, 2023). In addition, an estimated 1.05 billion tonnes of food were wasted at the retail, food service, and household levels (UNEP, 2024; FAO et al., 2023). This is not only caused by behavioural issues, but also structural and legislative ones. Laws shape how food is produced, transported, sold, and consumed, and in doing so they determine what is lost, what is wasted and who is affected.

Food loss and waste carry significant economic costs as well. Inefficient systems increase public spending on waste management, reduce incomes for producers and vendors, and place additional pressure on already stretched urban services. Reducing food waste is therefore an economic priority.

1.05bn

tonnes of food wasted at retail, food service & household level.



8-10 per cent

of global GHG emissions from food loss & waste.

13.2 per cent

of food lost between harvest and retail.

Reducing food loss and waste advances key global commitments, including SDG 2 (Zero Hunger), SDG 11 (Sustainable Cities), SDG 12 (Sustainable Consumption and Production), and SDG 13 (Climate Action).

This aligns as well with the New Urban Agenda's vision of inclusive and resilient urban development. Law is central to turning these commitments into practice. Planning regulations, building standards, service mandates, economic instruments and redistribution frameworks create the conditions that make food loss as well as waste prevention and recovery possible.

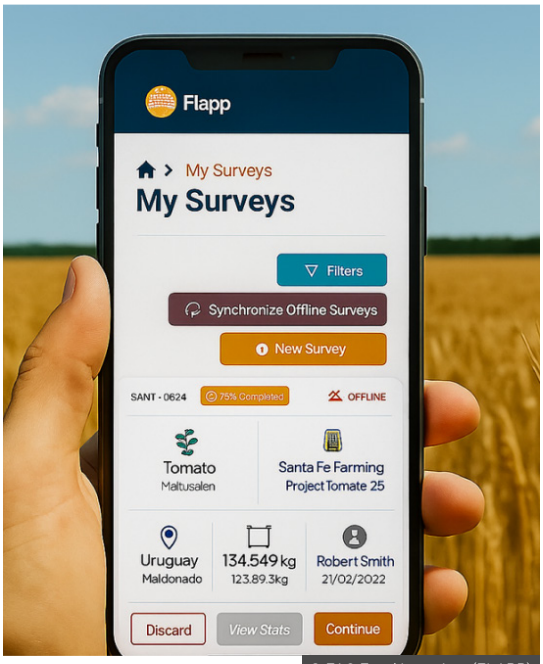
This brief is intended for local and national policymakers, urban planners, and legal practitioners involved in shaping governance frameworks for urban food systems. Drawing on experiences and case studies from cities worldwide, it illustrates how legal and

governance approaches can effectively reduce food loss and waste in practice. There is no universal model, as effective approaches are shaped by context, available capacity and local priorities. However, one consistent principle emerges: legal frameworks are most effective when they align with implementation realities, are supported by adequate infrastructure and financing, as well as complemented by capacity development.

Ongoing work by partners such as FAO further highlights the importance of legal assessments and practical guidance to help governments identify gaps and design effective, context-specific solutions. By systematically reviewing how existing laws, policies, and institutional arrangements address food loss and waste, these efforts make visible the often-overlooked regulatory barriers and opportunities for reform, while pointing to clear entry points for action. In this regard, FAO's global initiatives on food loss and waste[1] are particularly instructive, placing regulatory frameworks as a central pillar and supporting countries in assessing how waste is addressed across laws, policies, and institutional mandates.

These initiatives are complemented by practical tools such as the Food Loss App, which strengthen data collection and measurement, enabling more consistent, evidence-based decision-making. Together, these approaches help translate diagnostics into coherent legal and governance frameworks, ensuring that reforms are not only well-designed, but also implementable, coordinated, and grounded in local realities.

© FAO Food Loss App (FLAPP)



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[1] https://openknowledge.fao.org/server/api/core/bitstreams/57f76ed9-6f19-4872-98b4-6e1c3e796213/content

A. WHERE URBAN PLANNING LAW REDUCES WASTE

Urban planning decisions shape how food systems function within cities. Zoning regulations, building codes, infrastructure planning and municipal mandates can either confine waste or help prevent it. When plans fail to allocate space for food recovery hubs, redistribution centres, composting facilities, wholesale markets, or decentralised treatment systems, they create structural barriers. In these contexts, even well-intentioned households, businesses, and civil society actors are limited by what the system allows.

When planning frameworks are aligned with circular food systems such as in Milan, the opposite happens: multipurpose zoning can support food logistics and redistribution. Building codes can require on-site organic waste separation in large developments. Urban plans can integrate decentralized treatment and recovery infrastructure. Public procurement rules can prioritise waste reduction. These are not add-ons; they expand what cities are able to do in practice to tackle food waste issues.

Milan, Italy © Apurva Chandwadkar/ Pexels

Milan, Italy

Challenge: Limited integration of food systems into urban planning.

Legal measure: The *Piano di Governo del Territorio (Land Management Plan) (2019)* embedded food policy guidelines into planning instruments.

Implementation: New public developments were required to incorporate organic waste reduction measures.

Outcome: Paired with the city's broader food policy, there was a 30 per cent increase in separately collected organic waste in targeted districts within three years (Comune di Milano, 2019).

B. WHERE COORDINATED INSTITUTIONAL ACTION REDUCES WASTE

Legal frameworks are most effective when they are supported by clear institutional arrangements. Reducing food loss and waste cuts across multiple sectors, including planning, waste management, agriculture, health and commerce. Without effective coordination, responsibilities remain fragmented and implementation stalls.

Some cities such as Singapore have tackled this challenge by creating formal governance structures, including inter-agency task forces, advisory committees, or dedicated food policy councils.

When supported by legal or policy mandates, these bodies help coordinate stakeholders, clarify responsibilities, and ensure accountability across the system. They can also facilitate data sharing, track progress, and guide the sequencing of interventions, especially in contexts where infrastructure, regulation, and behavioural change need to advance in tandem.

Embedding institutional coordination mechanisms within legal and policy frameworks strengthens implementation. It shifts food waste reduction from a set of isolated actions to a structured, system-wide approach.

Singapore © Joshua Leong/ Pexels

Singapore

Challenge: Fragmented responsibilities across agencies managing food waste, sustainability and resource efficiency.

Legal measure: Establishment of an inter-agency approach under the Zero Waste Masterplan, supported by regulatory measures including mandatory food waste segregation for large generators.

Implementation: Coordination across agencies, including the National Environment Agency, to align infrastructure rollout, regulation and industry compliance.

Outcome: Improved system-wide coordination, enabling the phased introduction of food waste segregation requirements and supporting infrastructure. (Government of Singapore, 2019).

C. WHERE HOUSING LAW SHAPES WHAT GETS WASTED

Housing conditions and storing capabilities play a direct role in how food is stored, used, and discarded. The ability to store food safely, separate organic waste, and prevent spoilage depends not only on behaviour, but on the infrastructure built into homes and neighbourhoods. Globally, an estimated one billion people live in slums and informal settlements (UN Statistics Division, 2023), often without reliable refrigeration, adequate storage space, drainage, or regular waste collection. In these conditions, food deteriorates faster and organic waste accumulates in ways that pose health and environmental risks.

Legal and regulatory frameworks governing housing can shape these outcomes. In formal housing, building codes and standards can embed waste reduction into housing design. Requirements for adequate kitchen storage, ventilation, source separation and shared composting infrastructure make prevention part of everyday practice.

In informal settlements, however, conventional building codes are often not appropriate. More effective approaches focus on tenure-sensitive upgrading, gradual service provision and community-based solutions, rather than imposing standards designed for formal construction.

The key issue, as Vienna demonstrates, is sequencing, specifically, the order and timing in which legal obligations are introduced relative to the availability of services and infrastructure. Legal obligations to separate or manage organic waste only work when basic services, including collection, infrastructure, and technical support, are already in place or are introduced at the same time. Without this, requirements risk penalizing those who are least equipped to comply. Well-designed legal frameworks-align regulatory ambition and standards with service delivery realities, while also promoting awareness and capacity-building to ensure that standards expand capabilities rather than deepen exclusion.

Sorted waste containers, Vienna © Vince Morris

Vienna, Austria

Challenge: Integrating waste reduction into high-density housing while maintaining affordability and tenant security.

Legal measure: Social Housing Programme (2020–2025) requiring organic waste separation infrastructure and shared storage in new developments.

Implementation: Standards embedded in housing design, combined with resident awareness and support.

Outcome: Increased organic waste capture rates in participating housing blocks, without compromising tenure security for low-income tenants (City of Vienna, 2019).

D. LEGAL FRAMEWORKS AND FOOD WASTE: THE FOUNDATIONAL ROLE OF URBAN INFRASTRUCTURE

Food separation mandates are ineffective when no collection systems support them. A household that separates food waste but lacks access to regular collection cannot deliver the outcome the law intends. A market vendor who complies with licensing requirements but has no access to nearby cold storage cannot prevent spoilage at scale. In both cases, the failure is not behavioural but structural. Infrastructure is not a secondary condition for compliance. It provides the material foundation that makes it possible.

When regulatory obligations are introduced before service systems are operational, compliance remains limited and contamination rates rise. Households and businesses adapt to the constraints they face. If collection is irregular or absent, food separation becomes irrational. Effective legal design therefore depends on sequencing.

Service delivery must precede or accompany behavioural mandates so that compliance is realistic rather than aspirational. Statutory service provision requirements can correct this imbalance. Laws that require municipalities to introduce food organics collection within defined timeframes establish regulatory certainty and clarify public responsibility. They also send credible signals to processors and investors that feedstock supply will materialize.

In rapidly urbanizing contexts, where private capital is time-bound, such public obligations reduce risk and help unlock investment. Binding legal commitments, aligned with implementation capacity as seen in New South Wales, create the conditions under which infrastructure expands, and waste reduction becomes systemically achievable.

Waste collection trucks in Brisbane, Australia in 2020 © Kgbo/ Wikimedia commons

New South Wales, Australia

Challenge: Limited and inconsistent provision of organics collection across municipalities.

Legal measure: Environment Protection Legislation Amendment Act (2021) mandating food organics and garden organics (FOGO) collection by 2030.

Implementation: Phased rollout of services, aligned with infrastructure development and regulatory timelines.

Outcome: Increased organic waste diversion in early-adopter councils and reduced contamination as systems matured (NSW Environment Protection Authority, 2022).

E. ENABLING WASTE MANAGEMENT SYSTEMS: WHEN LAW MOVES BEYOND PRINCIPLES

In many low-and middle-income cities, food and green waste account for most municipal solid waste streams, often exceeding fifty percent. When organic materials are landfilled or openly dumped, cities confront a cascade of interconnected impacts. Food loss and waste alone contribute an estimated 8-10 per cent of global greenhouse gas emissions (IPCC, 2019), making the diversion of organic waste one of the most effective climate mitigation measures available to municipal governments.

At the same time, improper disposal heightens public health risks through pathogen exposure and vector-borne diseases, while driving up the financial burden of waste collection and disposal systems and contributing to economic losses for traders and farmers. Not all food loss and waste interventions deliver the same environmental benefits. Life cycle approaches help identify where prevention yields the greatest impact, avoiding trade-offs where, for example, increased packaging reduces spoilage but raises other environmental burdens.

While the waste hierarchy; prioritizing prevention, redistribution, recovery, and disposal as a last resort, is embedded as a guiding principle in many national legal frameworks, the central challenge lies in operationalizing it. Without enforceable rules and supportive infrastructure, the hierarchy remains aspirational rather than actionable.

Legal and economic instruments can reinforce each other to drive meaningful diversion. Cities that implement variable-rate waste fees, charging higher rates for residual waste while ensuring organics collection remains affordable, create tangible incentives for households and businesses to separate waste at the source.

The timing and sequencing of these instruments are critical: when service provision precedes pricing, and when affordability measures protect low-income residents, compliance rates increase, contamination is reduced, and illegal dumping is minimized.

Legal mandates alone are insufficient without aligned infrastructure and economic signalling. By combining enforceable separation requirements, such as in Republic of South Korea and France, with structured economic incentives and predictable service delivery, municipal law can transform food and green waste from an environmental liability into a resource for recovery, composting, and circular urban systems.

Republic of South Korea © Polina Kneis/ Pexels

Republic of South Korea

Challenge: High levels of food waste and low separation rates at the household level.

Legal measure: National legislation introduced mandatory source separation and volume-based waste fees, supported by Radio Frequency Identification-enabled collection systems.

Implementation: Phased rollout, with Seoul implementing the system only in districts where collection services were fully operational.

Outcome: Food waste declined by approximately 30 per cent within two years, with household participation exceeding 95 per cent and minimal illegal dumping (World Economic Forum, 2019; Ministry of Environment, 2020).

Paris, France © Leinad Trappah/ Pexels

France

Challenge: High levels of food waste and systemic, large-scale waste of edible food by retailers.

Legal measure: The 2016 Law on the Fight Against Food Waste (Loi Garot) prohibits supermarkets with a sales area above 400 m² from destroying edible food and requires formal donation agreements with food aid organisations.

Implementation: The law transformed surplus redistribution from a discretionary act into a compliance obligation. Within two years, food donations increased by more than 20 per cent, with no recorded increase in food safety incidents (European Commission, 2023).

Outcome: The law has generated measurable sub-national impact. In the city of Courbevoie, local implementation has saved more than 500,000 meals since 2020, earning the city the FAO Green City label. Nationally, the legislation is estimated to save ten million meals annually. (Derambarsh, 2024).

F. URBAN-RURAL LINKAGES: CLOSING THE LEGAL GAPS IN FOOD SUPPLY

Food waste does not begin in cities. A significant share occurs earlier in the supply chain, during production, storage, transport and distribution.

As food moves from rural areas to urban markets, gaps in cold-chain infrastructure, fragmented logistics and weak regulatory frameworks increase the risk of spoilage.

FAO estimates that 13.2 per cent of food is lost between harvest and retail, highlighting the need to address the full system rather than only end-use consumption.

Law has a role here, but it often operates in the background. Standards for storage and transport, licensing rules, and how market regulations all shape how food moves.

Where these systems are weak or fragmented, losses increase. Where they are clearer and better aligned, food moves more efficiently and less is lost along the way. Infrastructure is part of this, but it is not just about building facilities. It is also about how they are financed, managed and accessed. In many contexts, cold storage and transport remain too expensive or unreliable for small producers. Without some form of support, these systems do not get used consistently.

Legal frameworks can help address this. They can enable public–private partnerships, support financing mechanisms, or allow for targeted subsidies where needed. They can also support shorter supply chains, for example through farmers' markets or direct sales, which reduce the number of intermediaries and lower the risk of loss.

Reducing food loss across urban–rural linkages, like in Rwanda, therefore require a mix of measures. It is about making sure that infrastructure exists, but also that it is usable, affordable and aligned with how people operate within the system.

Rwanda © Fatima Yusuf/ Pexels

Rwanda

Challenge: High post-harvest losses due to limited storage, aggregation and transport systems.

Legal/Policy measure: National Post-Harvest Handling and Storage Strategy, supported by regulations promoting aggregation centres and improved storage.

Implementation: Establishment of collection centres and support for cooperatives managing storage and distribution.

Outcome: Reduced post-harvest losses in key value chains and improved access to markets for smallholder farmers (FAO; Government of Rwanda 2020).

G. EQUITY AT THE CENTRE: INCLUSION AS LEGAL DESIGN

Food waste policies and laws can shift burdens onto those least able to absorb them if they are not carefully designed. Flat-rate waste fees often impose a heavier relative cost on low-income households. Licensing requirements, if introduced without support, can exclude small vendors. Separation mandates in areas without reliable services risk penalising communities that have never had access to basic infrastructure. Equity in policy and legal design is therefore not optional; it is a fundamental requirement.

These dynamics are not limited to cities. Along the supply chain, farmers and small-scale producers also face losses due to limited storage, lack of transport and weak market access. Without support, they carry the cost of inefficiencies they cannot control. Addressing food loss and waste therefore requires looking at who bears the risk, and how that risk is distributed.

Affordability is a key part of this. Infrastructure such as cold storage, collection systems or composting facilities does not maintain itself. Questions of who pays, who manages and who benefits need to be addressed upfront. In some contexts, this may require subsidies, cross-financing or targeted exemptions to ensure that systems remain accessible to low-income households and small producers.

Informal systems also play a significant role. In many cities, informal waste workers recover a large share of organic and recyclable materials, while urban and peri-urban farmers often reuse organic waste for compost or animal feed. These practices already contribute to circular systems, but they often operate without recognition or support. Legal frameworks that formalise these roles through contracts, cooperatives or licensing can improve both livelihoods and system efficiency.

Designing equitable legal frameworks, like in Brazil and India, means working with existing systems, not against them. When inclusion is built into legal design, food loss and waste reduction becomes not only more effective, but more sustainable over time.

Fresh vegetables for sale, Rio de Janeiro, Brazil © Giovana Montes Furlan/ Pexels

Brazil

Challenge: Limited legal clarity around food donation and informal recovery systems.

Legal measure: The Food Waste and Donation Law (Law No. 14.016/2020) clarified donor liability and enabled redistribution.

Implementation: Expansion of food banks and partnerships with civil society, alongside growing recognition of waste picker cooperatives in some cities such as Rio de Janeiro and Sao Paulo.

Outcome: Increased food redistribution and improved integration of informal actors into formal systems (FAO, 2020).

Pune, Maharashtra, India © Ankit Rainloure/ Pexels

Pune, India

Challenge: Informal waste workers operating without legal recognition or stable income.

Legal measure: Municipal service agreement recognising the Solid Waste Collection and Handling (SWaCH) cooperative.

Implementation: Formal contracting of waste pickers to deliver door-to-door collection.

Outcome: Over 3,500 workers integrated into the system, improving livelihoods while increasing recovery rates (WIEGO, 2022).

H. PRIORITY LEGAL AND POLICY ACTIONS

The above examples show that reducing food loss and waste is not driven by one law or one policy, but by how different parts of the system are aligned. What matters is not only what is regulated, but how measures are sequenced, financed, and implemented in practice. While there is no single model, several common actions emerge across contexts:

a. **Ensure reliable organics collection as a basic service:** Separation requirements only work when collection systems are regular, accessible and predictable (e.g. New South Wales, Australia).

b. **Set clear timelines for service rollout:** Time-bound legal obligations help clarify responsibility and give confidence to private operators and investors (e.g. New South Wales, Australia).

c. **Use economic instruments carefully:** Tools such as "pay-as-you-throw" can incentivise separation but need to be designed alongside subsidies or exemptions to remain affordable (e.g. Republic of Korea).

d. **Align urban planning and food system regulation:** Zoning, building codes and infrastructure planning should make space for storage, redistribution, treatment and recovery systems (e.g. Milan, Italy).

e. **Support surplus food redistribution:** Legal frameworks can enable safe donation through clear standards and liability protections (e.g. France).

f. **Update housing and building standards:** Requirements for adequate storage, ventilation and on-site separation systems can reduce waste at the household level (e.g. Vienna, Austria).

g. **Strengthen urban–rural linkages:** Legal and policy frameworks can support aggregation centres, wholesale markets, cold chains and shorter supply chains (e.g. Rwanda).

h. **Recognise and integrate informal systems:** Legal recognition of waste pickers, cooperatives and informal actors can improve both system performance and livelihoods (e.g. Pune, India; Brazil).

i. **Invest in monitoring and data systems:** Clear legal mandates for data collection and reporting help track progress and guide policy adjustments (e.g. Singapore).

I. CONCLUSION AND KEY TAKEAWAYS

Experience from cities worldwide consistently demonstrates that no single legal instrument can drive substantial or lasting reductions in food waste. Given its significant contribution to greenhouse gas emissions, reducing food loss and waste represents one of the most immediate and cost-effective climate mitigation opportunities available to cities.

Durable progress emerges from a comprehensive approach that layers multiple elements: direction-setting policies that establish overarching goals, legally mandated prevention targets, material hierarchies that prioritize reuse and recovery, clear institutional mandates assigning responsibilities, economic incentives that align behaviour with objectives, frameworks for safe redistribution, and robust monitoring and enforcement mechanisms.

Equally important is sequencing: measures must be introduced in a manner calibrated to the technical, financial, and administrative capacity of the city to implement them effectively. When sequencing is misaligned, even well-designed rules fail to produce meaningful outcomes.

Reducing food waste delivers economic as well as social and environmental benefits along the urban–rural continuum. It is therefore not simply about diverting organics from landfills, but about designing urban systems that treat food as a valued resource, protect vulnerable households and informal actors, and strengthen resilience throughout the food system.

Law and governance, when intentionally aligned with these objectives, shift the role of the city from passive waste manager to active waste preventer. Cities then move beyond reactive disposal to proactively shaping supply chains, markets, housing and basic services in ways that reduce loss, improve equity, and foster sustainable urban metabolism.

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