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A decorative graphic consisting of a green line that curves into a blue line, which then curves back into a green line, creating a stylized 'S' or 'e' shape.

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D.1.4.1 Stakeholder engagement model

ECOFOODCYCLE

Reducing Food Waste and its Environmental Footprint through Sustainable Food Systems

D.1.4.1 Stakeholder engagement model

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Introduction

Food waste is a pressing global issue, with nearly one-third of all food produced being lost or wasted. Food waste occurs at different points along the food supply chain, from production and processing to distribution, retail, and consumption. Addressing this problem requires a multi-stakeholder approach that brings together governments, businesses, farmers, retailers, consumers, and non-governmental organizations (NGOs) to develop sustainable solutions.

This Stakeholder Engagement Model outlines a structured collaborative framework, identifies key challenges, and provides strategic actions to enhance coordination among various entities involved in reducing food waste.

Food Waste

Food waste represents a significant challenge in Europe, with profound environmental, economic, and social implications. Addressing this issue requires a comprehensive understanding of its scale, underlying causes, and the multifaceted strategies necessary for effective mitigation.

In 2022, the European Union (EU) reported an average of 132 kilograms of food waste per capita, culminating in over 58 million tonnes of wasted food across member states. Notably, households were responsible for 54% of this waste, equating to approximately 72 kilograms per person. The food manufacturing sector contributed 21%, while primary production accounted for 9% of the total food waste¹. These figures underscore the pervasive nature of food waste across all stages of the food supply chain, from production to consumption.

The repercussions of food waste extend beyond the immediate loss of consumable goods. The resources expended in food production—including land, water, and energy—are squandered when food is discarded. Moreover, decomposing food waste in landfills emits methane, a potent greenhouse gas that exacerbates climate change. When food waste ends up in landfills, it decomposes and releases methane, a greenhouse gas that is 25 times more potent than CO₂ in contributing to global warming². Economically, the EU faces substantial losses, with billions of euros worth of food

¹ Eurostat. (2022). Food waste and food waste prevention - estimates. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Food_waste_and_food_waste_prevention_-_estimates

European Commission. (2021). EU actions against food waste. Retrieved from https://food.ec.europa.eu/food-safety/food-waste/eu-actions-against-food-waste_en

² Zero Waste Europe. (2024). European Parliament gives green light to food waste targets: Prevent Waste Coalition welcomes targets, but is disappointed with low ambition. Retrieved from <https://zerowasteurope.eu/press-release/european-parliament-gives-green-light-to-food-waste-targets-prevent-waste-coalition-welcomes-targets-but-is-disappointed-with-low-ambition/>



being discarded annually. This inefficiency not only affects producers and retailers but also has broader implications for food security and resource allocation³.

Numerous factors contribute to the high levels of food waste in Europe, for instance:

1. **Consumer Behaviour:** Misinterpretation of date labels, such as "best before" and "use by," leads many consumers to discard food prematurely. A survey highlighted widespread confusion over these labels, resulting in unnecessary waste.
2. **Retail Practices:** Supermarkets often impose strict aesthetic standards, leading to the rejection of perfectly edible but cosmetically imperfect produce. Additionally, marketing strategies like bulk promotions can encourage over-purchasing, increasing the likelihood of household waste.
3. **Supply Chain Inefficiencies:** Inadequate storage and transportation infrastructure, especially in the primary production sector, result in significant post-harvest losses. Perishable goods are particularly vulnerable to spoilage without proper handling.
4. **Hospitality Sector Practices:** Due to several, operational practices such as: excessive portion sizes, over-preparation, aesthetic standards and consumer expectations for visually perfect dishes all result in the disposal of food that is still edible.

Recognizing the gravity of the issue, the EU has implemented several policies aimed at reducing food waste:

- **Waste Framework Directive (2008/98/EC)⁴:** This directive mandates member states to monitor and report food waste levels, establishing a foundation for targeted reduction strategies.
- **EU Code of Conduct on Responsible Food Business and Marketing Practices⁵:** Introduced in July 2021, this code encourages food businesses to adopt sustainable practices, including commitments to prevent and reduce food loss and waste.
- **Food Waste Reduction Targets⁶:** The European Parliament has set forth proposals for binding food waste reduction targets. While these targets signify political commitment, some

³ European Food Information Council (EUFIC). (n.d.). Food waste in Europe: statistics and facts about the problem. Retrieved from <https://www.eufic.org/en/food-safety/article/food-waste-in-europe-statistics-and-facts-about-the-problem>

⁴ https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en

⁵ https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy/sustainable-food-processing/code-conduct_en

⁶ https://food.ec.europa.eu/food-safety/food-waste/eu-actions-against-food-waste/food-waste-reduction-targets_en



advocacy groups argue that they lack the ambition necessary to achieve a 50% reduction by 2030, as outlined in the EU Green Deal and the UN Sustainable Development Goals.

Various stakeholders across Europe have pioneered initiatives to combat food waste, for instance:

- **Retail Sector Innovations:** Leading supermarkets, such as Tesco, have pledged to halve their food waste by 2025. Strategies include optimizing inventory management, offering discounts on near-expiry products, and collaborating with food redistribution organizations like FareShare to channel surplus food to those in need.
- **Consumer Education Campaigns:** Public awareness initiatives aim to educate consumers on interpreting date labels accurately and adopting practices like meal planning and proper food storage to minimize waste.
- **Technological Solutions:** The development of applications and platforms facilitates the redistribution of surplus food from households and businesses to charities, ensuring that excess food reaches those who can utilize it.

Despite these efforts, significant challenges persist:

- **Behavioural Change:** Altering consumer habits requires sustained educational efforts and cultural shifts toward valuing food resources.
- **Policy Harmonization:** Disparities in food waste policies across member states necessitate a cohesive, EU-wide framework to ensure uniform progress.
- **Infrastructure Development:** Enhancing storage and transportation facilities, particularly in the primary production sector, is crucial to reducing spoilage and waste.

Addressing food waste in Europe demands a collaborative, systemic approach involving policymakers, industry stakeholders, and consumers. By implementing robust policies, fostering innovation, and promoting education, Europe can make substantial strides toward reducing food waste, thereby safeguarding environmental resources and enhancing food security for its population.

Multistakeholder Engagement Models

Multistakeholder engagement models have emerged as a crucial approach in addressing complex societal challenges and governance issues. These models are designed to bring together diverse groups of stakeholders to participate in dialogue, decision-making, and implementation of solutions for common problems or goals. By incorporating inputs from all relevant parties affected by policies or initiatives, these models aim to create more inclusive and effective outcomes.



At their core, multistakeholder engagement models are characterized by the involvement of diverse stakeholders in a learning process, working towards a common goal while integrating different sectors and scales. They focus on bringing about change and dealing with structural issues through the creation of agreements based on cooperation. These models also emphasize the conscious handling of power dynamics and conflicts, as well as the integration of bottom-up and top-down strategies.

The benefits of implementing multistakeholder engagement models are numerous. They can lead to enhanced understanding of project stakeholders, improved identification of project risks, and more effective management of stakeholder expectations. Additionally, these models often result in increased stakeholder satisfaction, better relations with affected parties, and more efficient decision-making processes. By preventing project delays and obstacles, they contribute to improved risk management and accountability, ultimately creating trust and goodwill among participants.

The functioning of multistakeholder models typically involves three key stages. First, relevant stakeholders are identified and invited to participate in discussions, working groups, and forums. Next, these stakeholders engage in open dialogue, negotiations, and collaborative problem-solving to reach agreements that reflect the collective will. Finally, once consensus is reached, policies are developed and implemented with continued collaboration during the implementation phase (detailed overview in Textbox 1).



Textbox 1: Developing a multistakeholder engagement process

1. Define the purpose and scope: Clearly articulate the issue, purpose, and scope of the engagement process. This includes setting goals, identifying the geographic and strategic boundaries, and determining the expected outcomes.
2. Identify and map stakeholders: Conduct a thorough stakeholder analysis to identify all relevant actors and organizations. Use tools like stakeholder ecosystem maps, analysis tables, and importance/influence matrices to prioritize and categorize stakeholders.
3. Engage stakeholders: Reach out to potential participants through various means such as individual invitations, open calls, or announcements at events. Clearly communicate the benefits of participation and the group's objectives to motivate long-term commitment.
4. Create a roadmap: Develop a shared roadmap that outlines objectives, expected outcomes, resources, timelines, and responsibilities. This helps align all participants and provides a clear vision for the process.
5. Design the engagement strategy: Determine the appropriate level of engagement for each stakeholder group, ranging from informing to empowering. Choose suitable communication methods and establish ground rules for interaction.
6. Prepare for engagement: Focus on long-term goals, determine logistics, and set rules for the engagement process. Prepare necessary materials and build relationships with stakeholders.
7. Conduct the engagement: Facilitate meetings or other forms of interaction, ensuring equitable stakeholder contribution and managing potential tensions while staying focused on priorities.



Although multistakeholder engagement models can face different challenges (e.g., power imbalances among stakeholders, the resource-intensive nature of participation, potential influence of funding sources on agendas, lack of concrete outcomes in some initiatives, and the complexity arising from numerous initiatives competing for stakeholders' attention), when implemented effectively, multistakeholder engagement models can foster transparency, inclusivity, and collaborative problem-solving in complex governance and development issues. By bringing together and connecting diverse perspectives and expertise, these models have the potential to create more sustainable and widely accepted solutions to pressing global challenges.

Importance of Multistakeholder Collaboration and Networking in Reducing Food Waste

Food waste is a complex and systemic issue that affects the entire food supply chain, from agriculture and production to retail and consumer behaviour. Since multiple sectors contribute to food waste, no single entity—whether governments, businesses, or individuals—can solve the problem alone. A multi-stakeholder approach is essential to coordinate policies, implement effective solutions, and drive behavioural change across society.

One of the primary reasons for multi-stakeholder collaboration is the complexity of food waste. It occurs at various stages of the food supply chain. At the production level, inefficient harvesting, surplus production, and strict quality standards lead to significant losses. In processing and distribution, poor storage facilities and supply chain inefficiencies contribute to spoilage. At the retail stage, supermarkets reject food due to aesthetic standards or mislabelling, resulting in unnecessary waste. Finally, consumers often over-purchase, store food improperly, and discard items due to confusion over date labels. Since food waste occurs at multiple levels, collaboration between stakeholders is necessary to tackle the issue holistically.

Food waste is a shared responsibility that requires collective action across multiple sectors. Governments must create strong policies, businesses should implement waste reduction strategies, NGOs need to facilitate food redistribution, consumers must adopt more responsible habits, and researchers should provide scientific guidance. By working together, these stakeholders can significantly reduce food waste, conserve valuable resources, and improve food security for future generations.

Multi-stakeholder collaboration ensures that:

- Different perspectives and expertise are brought together.
- Resources are shared efficiently to maximize impact.
- Innovative solutions can be developed across sectors.
- Accountability and policy support are strengthened.



A fragmented approach can lead to inefficiencies, conflicting policies, and wasted efforts. A collaborative model enhances impact, scalability, and long-term sustainability.

To promote collaboration between stakeholders and maximize the impact of food waste reduction initiatives, this model proposes the creation and implementation of Stakeholder Engagement Network (SEN) or multi-stakeholder networks (MSNs). These networks can serve as a platform that brings diverse stakeholders together, enabling them to collaborate effectively, share resources, and align their efforts toward common objectives. By fostering a culture of shared responsibility and coordinated action, SEN enhances the scalability and sustainability of food waste reduction strategies.

Stakeholder Engagement Networks: A Key to Collective Action

A Stakeholder Engagement Network⁷ in general is a collaborative, interconnected group of individuals, organizations, or entities representing diverse interests, who work together towards a shared objective through communication, cooperation, and coordinated action. A SENs or MSNs, although MSNs have a broader concept, for food waste prevention can be defined as a coordinated alliance of stakeholders from across the food system – including government agencies, businesses (producers, retailers, food service), NGOs, research institutions, and consumers – who collaborate to reduce food waste through shared knowledge, aligned strategies, and collective action.

Stakeholder engagement networks are vital platforms for reducing food waste by facilitating collaboration and knowledge sharing among diverse stakeholders. These networks, such as ReFED's Food Waste Action Network⁸ developed in United States, bring together influential leaders and decision-makers to drive collective action. By leveraging these networks, stakeholders can share best practices, align their efforts, and work towards common goals like halving food waste by 2030.

Benefits of Engagement Networks:

- Collaborative Problem-Solving: Networks enable stakeholders to pool their expertise and resources, leading to more effective solutions.
- Resource Sharing: They facilitate the exchange of knowledge, technologies, and strategies, enhancing efficiency in food waste reduction.
- Incentivizing Participation: Success stories from these networks can attract new stakeholders and encourage broader participation.

⁷ Rowley, T. J. (1997). Moving beyond dyadic ties: A network theory of stakeholder influences. *Academy of management Review*, 22(4), 887-910, <https://doi.org/10.5465/amr.1997.9711022107>.

⁸ <https://refed.org/engage/food-waste-action-network/>



Addressing Challenges:

- **Power Imbalances:** Establish clear communication channels and ensure equitable participation to mitigate power imbalances.
- **Conflicting Interests:** Set common goals and foster a collaborative environment to align diverse interests.

By leveraging the strengths and resources of diverse stakeholders, SENs not only enhance the scalability and sustainability of food waste reduction strategies but also drive systemic change across the entire food supply chain.

Intersection Of Stakeholder Engagement Model And Stakeholder Engagement Network for Food Waste Reduction

Concepts of the stakeholder engagement models and stakeholder engagement networks emphasize the importance of collaboration and inclusive decision-making. However, the stakeholder engagement model provides a structured framework for involving stakeholders, while the stakeholder engagement network for food waste reduction applies this framework in practice by mobilizing all stakeholders to address food waste through collaborative efforts. When applied together, their synergy enhances the effectiveness of initiatives aimed at reducing food waste by ensuring that all relevant stakeholders are engaged and their perspectives are considered in the decision-making process.

Stakeholder Engagement Model for Food Waste Reduction

Relevant Stakeholders

There are various stakeholders which can play a role in reducing food waste. Governments play a central role in setting regulations and policies to reduce food waste. They establish food waste reduction targets, regulate food labelling, and provide incentives (e.g., tax breaks) for food redistribution. In the European Union (EU), the Farm to Fork Strategy and various national policies, such as France's ban on supermarket food waste, demonstrate how government intervention can drive systemic change. However, policies are only effective when coordinated with food producers, retailers, and charities, ensuring that laws are practical and impactful. Governments and European Union bodies should work together to support research and development of innovative waste prevention technologies. Through coordinated policies and joint financial resources, they can promote the development and implementation of new technological solutions that effectively reduce waste. Such collaboration enables the alignment of regulatory frameworks and strengthens innovation capacities at the local, regional, and European levels.

Businesses, including farmers, food manufacturers, supermarkets, and restaurants, have direct control over food supply chains and can drive innovation. Farmers and food producers can work with retailers to optimize harvesting techniques and reduce surplus production. Supermarkets can adjust



purchasing policies, discount near-expiry products, and donate unsold food to charities instead of discarding it. The hospitality sector, including restaurants and hotels, can implement portion control, composting, and food-sharing initiatives to minimize waste. Additionally, technology companies contribute innovative solutions, such as AI-powered inventory management systems and food-sharing apps like *Too Good To Go*, which help reduce food waste by redistributing surplus meals.

Non-governmental organizations (NGOs) and charities play a crucial role in food redistribution and consumer education. Many organizations, such as FareShare in the UK, Banco Alimentare in Italy, and The Food Bank Network in France, work with supermarkets and food producers to redirect surplus food to people in need. Without these NGOs facilitating the redistribution process, much of this food would go to waste. Additionally, NGOs contribute to awareness campaigns that educate consumers on responsible food consumption and waste reduction.

Consumers are a key part of the solution, as households generate over 50% of total food waste in Europe. Many consumers discard food prematurely due to misinterpretation of date labels, poor meal planning, and improper storage practices. Governments, businesses, and NGOs must collaborate to educate the public on reducing food waste. Retailers can also contribute by simplifying food labels, offering portion-sized packaging, and encouraging sustainable purchasing habits.

Research institutions and universities play a critical role in providing data-driven solutions for reducing food waste. They analyse food waste trends, develop innovative waste prevention technologies, and provide evidence-based recommendations for policymakers and businesses. Collaboration between researchers, businesses, and governments ensures that food waste reduction strategies are based on scientific insights and real-world applicability. Pilot projects can be tested in different sectors to identify best practices before being widely implemented.

Each stakeholder (Table 1) has a unique role, but effective coordination is required to align their efforts.



Table 1: Key stakeholders in food waste reduction

Stakeholder Group	Role in Food Waste Reduction	Key Challenges
Government & Policy Makers	Establishing policies, incentives, and food waste regulations.	Policy enforcement, lack of standardized laws.
Farmers & Agricultural Producers	Optimizing harvesting, reducing post-harvest losses, and sustainable farming practices.	Market fluctuations, lack of storage infrastructure.
Food Manufacturers & Processors	Improving supply chain efficiency, sustainable packaging, reducing overproduction.	High operational costs, limited incentives for donation.
Retailers & Supermarkets	Optimizing inventory, discounting near-expiry products, consumer education.	Overstocking, high aesthetic standards for produce.
Restaurants & Food Service Providers	Portion control, food repurposing, surplus donation.	Consumer expectations, food safety concerns.
Consumers & Households	Meal planning, proper food storage, behavioral changes.	Misunderstanding expiration labels, over-purchasing.
NGOs & Food Banks	Redistributing surplus food, raising awareness, advocating policy changes.	Funding, logistical challenges.
Technology & Logistics Providers	AI-driven forecasting, cold chain logistics, waste tracking.	Adoption costs, integration with existing systems.
Research institutions and universities	providing data-driven solutions for reducing food waste	Lack of opportunities to test solutions directly.

Stakeholder Engagement Framework

A structured Stakeholder Engagement Model and Network ensures that all actors work together effectively. The department’s model for stakeholder engagement has been adapted from the international standard developed by the Institute of Social and Ethical Accountability (2005)⁹. The stakeholder engagement process is a comprehensive, cyclical approach designed to enhance strategic planning, execution, and evaluation of all engagement activities. This five-step methodology fosters continuous improvement and builds a robust, evidence-based foundation for stakeholder relations.

⁹ AccountAbility. 2005. AA1000SE Stakeholder Engagement Practitioner’s Perspectives. <https://www.accountability.org/standards/aa1000-stakeholder-engagement>



Table 2: Five step stakeholder engagement model

1. Think Strategically	- Align engagement efforts with core business objectives
	- Identify key stakeholders and their relevance to specific issues
	- Conduct preliminary prioritization of stakeholders and concerns
2. Plan Meticulously	- Explore various engagement levels and approaches
	- Analyse existing relationships and organizational constraints
	- Assess available resources for engagement initiatives
	- Gain deeper insights into stakeholder representatives
3. Prepare Thoroughly	- Define desired relationship outcomes with each stakeholder group
	- Evaluating internal and external engagement capabilities
	- Ensuring all parties can participate effectively
4. Engage Effectively	- Addressing any potential barriers to engagement
	- Selecting and implementing appropriate engagement techniques
	- Designing a tailored approach based on previous steps
5. Evaluate and Improve	- Aligning engagement methods with specific objectives and situations
	- Following up on engagement outputs
	- Assessing the quality and impact of engagement efforts
	- Providing stakeholders with feedback and assurance
	- Identifying areas for improvement in future engagement cycles

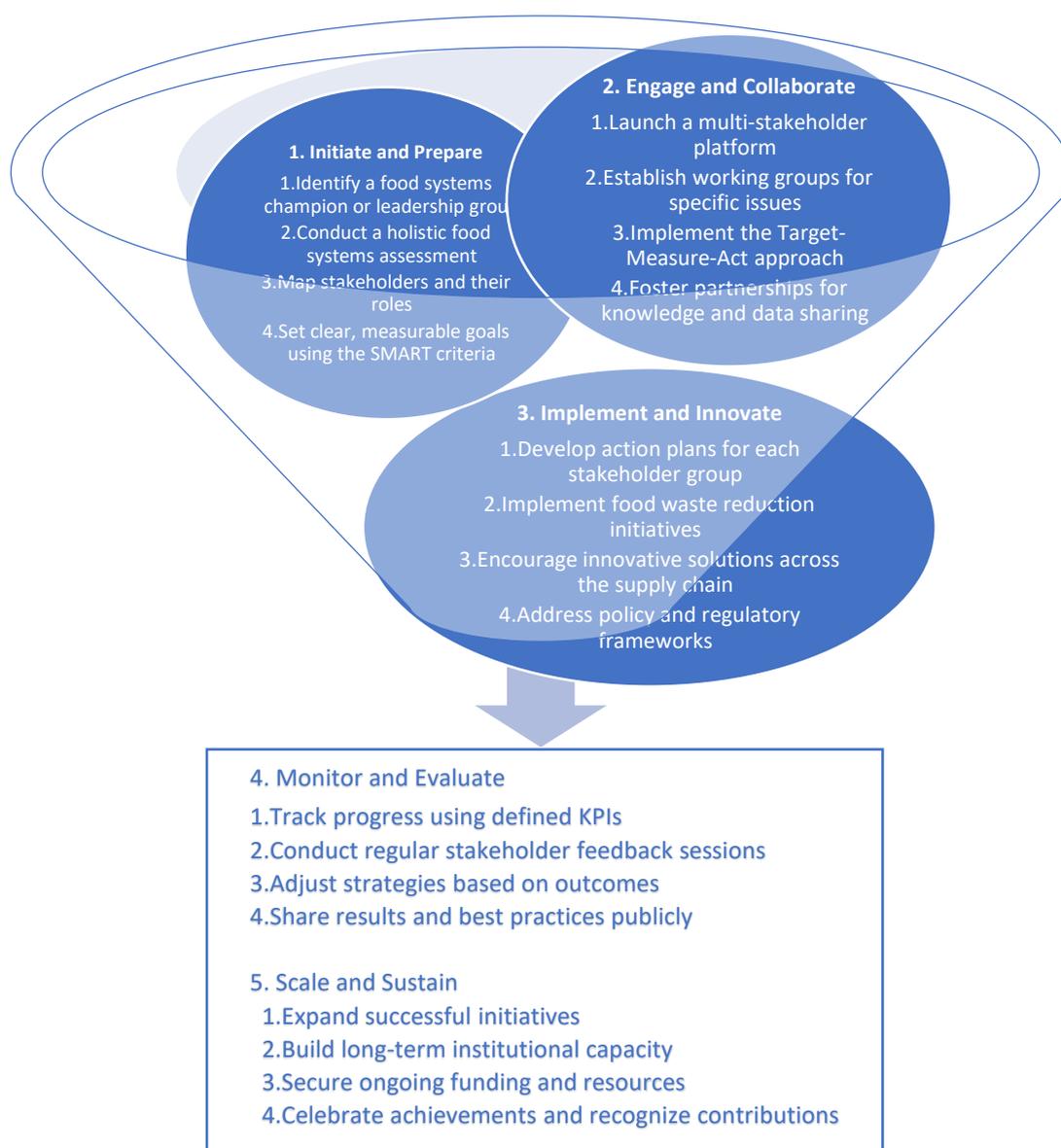
This iterative process ensures that stakeholder engagement remains dynamic, responsive, and continuously evolving to meet changing business needs and stakeholder expectations.

A Framework for Multistakeholder Engagement in Food Waste Reduction

Based on the stakeholders identified and the Five step stakeholder engagement model, a comprehensive framework for multistakeholder engagement in food waste reduction is presented on Graf 1, elaborated in detail in the following section.



Graf 1: Framework for multistakeholder engagement in food waste reduction



Framework For Multistakeholder Engagement in Food Waste Reduction - Detailed Steps for Implementation of The Multistakeholder Engagement in Food Waste Reduction

Food waste is a critical global challenge that requires coordinated action across the entire food supply chain. Addressing this complex issue demands a comprehensive, collaborative approach that engages diverse stakeholders from government, industry, civil society, and academia. The Framework for Multistakeholder Engagement in Food Waste Reduction provides a structured, actionable roadmap for bringing these diverse actors together to create lasting, systemic change. This framework is designed to foster innovation, promote knowledge sharing, and drive concrete actions that can significantly reduce food waste at every stage of the food system. By following the detailed steps outlined in this implementation guide, stakeholders can work together more effectively to tackle food waste, contributing to improved food security, reduced environmental impact, and enhanced economic efficiency. Next, we provide a step-by-step approach to implementing this multistakeholder engagement model, offering practical guidance for initiating, executing, and sustaining food waste reduction efforts across sectors and regions.

1. Initiate and Prepare

a) Identify a food systems champion:

- Select an individual or group with the influence and passion to drive the initiative
- Ensure they have access to key decision-makers across sectors

b) Conduct a holistic food systems assessment:

- Analyze current food waste levels and hotspots
- Identify existing initiatives and gaps
- Assess policy landscape and potential barriers

c) Map stakeholders and their roles:

- Create a comprehensive list of stakeholders across the food supply chain
- Define each stakeholder's potential contribution and interests
- Identify potential conflicts or synergies between stakeholders

d) Set clear, measurable goals:

- Develop SMART objectives for food waste reduction
- Align goals with broader sustainability and economic objectives
- Ensure goals are adaptable to different stakeholder capacities



2. Engage and Collaborate

a) Launch a multi-stakeholder platform:

- Organize an initial meeting with all identified stakeholders
- Present the food systems assessment and proposed goals
- Facilitate open dialogue and consensus-building

b) Establish working groups:

- Create specialized groups for key areas (e.g., policy, technology, consumer behavior)
- Ensure diverse representation within each group
- Set clear objectives and timelines for each group

c) Implement the Target-Measure-Act approach:

- Help stakeholders set individual and collective targets
- Establish standardized measurement methodologies
- Develop action plans tailored to each stakeholder's role

d) Foster partnerships:

- Encourage data sharing agreements between stakeholders
- Facilitate knowledge exchange through regular forums
- Support the development of collaborative projects

3. Implement and Innovate

a) Develop action plans:

- Work with each stakeholder group to create specific strategies
- Ensure plans address the unique challenges of each sector
- Incorporate both short-term actions and long-term goals

b) Implement food waste reduction initiatives:

- Support stakeholders in launching their planned activities
- Provide resources and guidance where needed
- Encourage pilot projects to test new approaches



c) Encourage innovative solutions:

- Organize innovation challenges or hackathons
- Facilitate connections between tech providers and food sector stakeholders
- Support the scaling of promising technologies and practices

d) Address policy and regulatory frameworks:

- Work with government stakeholders to identify policy barriers
- Develop recommendations for supportive legislation
- Advocate for incentives that encourage food waste reduction

4. Monitor and Evaluate

a) Track progress using defined key process indicators (KPIs):

- Implement a centralized data collection system
- Regularly update and share progress dashboards
- Conduct periodic in-depth analyses of impact

b) Conduct stakeholder feedback sessions:

- Organize quarterly review meetings with all stakeholders
- Gather insights on challenges and successes
- Identify areas for improvement and collaboration

c) Adjust strategies based on outcomes:

- Review and revise action plans as needed
- Address emerging challenges promptly
- Scale successful initiatives across stakeholder groups

d) Share results publicly:

- Publish annual reports on progress and learnings
- Use various communication channels to reach different audiences
- Highlight success stories and case studies



5. Scale and Sustain

a) Expand successful initiatives:

- Identify high-impact projects for wider implementation
- Develop toolkits and guides for replication
- Facilitate knowledge transfer between stakeholders and regions

b) Build long-term institutional capacity:

- Provide training and resources for ongoing stakeholder engagement
- Establish permanent working groups or committees
- Integrate food waste reduction into organizational strategies

c) Secure ongoing funding and resources:

- Develop a long-term funding strategy
- Explore innovative financing mechanisms (e.g., impact investing)
- Advocate for sustained government support and funding

d) Celebrate achievements:

- Organize annual awards or recognition events
- Publicize success stories through media partnerships
- Use achievements to inspire and motivate continued action

Building A Stakeholder Engagement Framework To Drive Collective Action

To enhance the Stakeholder Engagement Framework and to establish functional the Network, it is necessary to refine the identification of key stakeholders and develop a strategic approach tailored to their motivations and needs.

Targeted Stakeholder Segmentation and Motivation:

1. Governments:

- **National Agencies:** Responsible for setting food waste reduction targets and policies (e.g., environmental agencies, agriculture departments).
 - **Key Drivers:** Achieving national sustainability goals, reducing environmental impact, complying with international agreements (e.g., UN Sustainable Development Goals).
- **Local/Municipal Governments:** Implement waste management programs and regulations at the community level.



- **Key Drivers:** Reducing landfill costs, improving community sustainability, addressing local food security needs.

2. Businesses:

Segmenting businesses by size is an important factor in identifying and engaging this stakeholder group. Micro and small businesses focus on cost reduction and adapting to local markets, while medium-sized enterprises aim for operational efficiency and compliance with regulatory requirements. Large corporations have the most significant influence across the supply chain and are primarily motivated by reputation management and risk mitigation. By tailoring engagement strategies according to business size, it is possible to implement food waste reduction initiatives more effectively and foster collective action.

- **Farmers/Producers:** Growers of crops and livestock.
 - **Key Drivers:** Reducing losses due to spoilage, improving profitability, complying with regulations.
- **Food Manufacturers:** Processors of raw agricultural products into food items.
 - **Key Drivers:** Reducing waste in production, improving efficiency, enhancing brand reputation.
- **Supermarkets/Retailers:** Sell food products directly to consumers on a smaller or larger scale.
 - **Key Drivers:** Reducing waste from unsold items, meeting consumer demand for sustainable options, improving profitability.
- **Restaurants/Food Service: Prepare and serve food to consumers.**
 - **Key Drivers:** Reducing food costs, minimizing waste disposal fees, attracting environmentally conscious customers.
- **Technology Companies:** Develop and market innovative solutions to manage waste and surplus food.
 - **Key Drivers:** Business opportunities, creating sustainable solutions.

3. Non-Governmental Organizations (NGOs) & Charities:

- **Food Banks/Food Rescue Organizations:** Collect and redistribute surplus food to people in need.
 - **Key Drivers:** Addressing food insecurity, reducing food waste, providing social services.



- **Environmental Organizations:** Advocate for sustainable food systems and waste reduction policies.
 - **Key Drivers:** Protecting the environment, reducing greenhouse gas emissions, promoting sustainable resource management.
- **Consumer Advocacy Groups:** Educate consumers about responsible food consumption and waste reduction.
 - **Key Drivers:** Empowering consumers, promoting sustainable lifestyles.

4. Consumers:

- **Households:** Individuals and families who purchase and consume food.
 - **Key Drivers:** Saving money, reducing environmental impact, minimizing food spoilage, improving food safety.

5. Research Institutions and Universities:

- **Researchers:** Conduct studies on food waste trends, develop innovative waste prevention technologies, and provide evidence-based recommendations.
 - **Key Drivers:** Advancing scientific research, influencing policy, and creating sustainable solutions.

The Strategy:

A comprehensive strategy is designed to address the specific needs of the population and sector, ensuring maximum impact and engagement.

1. **Segmentation:** Businesses need to see economic value and efficiency in reduced waste and surplus redistribution.
2. **Motivation:** Financial incentives are essential for ensuring active participation and success.

Plan of Action:

1. **Understanding Unique Attributes:** Conduct research to identify appropriate distribution channels for surplus food.
2. **Creating Effective Communication and Educational Tools:** Organize workshops and community events to raise awareness about food waste reduction.



Expected Results:

1. **Reduction in Food Waste:** Measure the volume of food saved through coordinated efforts.
2. **Economic Efficiency:** Lower waste disposal costs and improve profitability for businesses.
3. **Enhanced Engagement:** Foster stronger collaboration among governments, businesses, NGOs, and consumers.

Framework For Multistakeholder Engagement In Reducing Food Waste In Italy And Croatia

Italy and Croatia, two Mediterranean countries with rich culinary traditions, face unique challenges and opportunities in addressing food waste. Italy, renowned for its gastronomic heritage, has been at the forefront of legislative efforts to combat food waste, as evidenced by the ground breaking Gadda law of 2016¹⁰. This law introduced innovative measures such as tax incentives for food donation and simplified procedures for redistributing surplus food. Croatia, while at an earlier stage in its food waste reduction journey, has made significant strides in recent years, particularly through its National Recovery and Resilience Plan, which includes digitalization of food donation systems¹¹. Both countries grapple with high levels of household food waste, with Italians discarding an average of 35.5 kilograms per capita annually in 2024¹², while Croatians generated about 71 kilograms per person annually in 2020¹³. These figures underscore the urgent need for a comprehensive, multistakeholder approach to food waste reduction that addresses the unique cultural, economic, and social factors influencing consumer behavior in both nations. Framework for multistakeholder engagement in reducing food waste between Italy and Croatia is presented in Textbox 2.

¹⁰ <https://igcat.org/italy-adopts-new-law-to-reduce-food-waste/>

¹¹ <https://www.eea.europa.eu/themes/waste/waste-prevention/countries/2023-waste-prevention-country-fact-sheets/croatia-waste-prevention-2023>

¹² <https://onfoods.it/magazine/food-waste-rise-italian-households-findings-2024-report-waste-watcher-observatory>

¹³ https://ec.europa.eu/food/safety/food_waste/eu-food-loss-waste-prevention-hub/eu-member-state-page/show/HR



Textbox 2: Framework for Multistakeholder Engagement in Reducing Food Waste in Italy and Croatia

1. Establish a National Food Waste Reduction Council

- a) Identify key stakeholders from government, food industry, NGOs, and academia
- b) Convene an inaugural meeting to establish the council's structure and objectives
- c) Develop a charter outlining the council's responsibilities and decision-making processes
- d) Set specific, measurable national targets for food waste reduction by 2030
- e) Draft a comprehensive national strategy, incorporating best practices from both countries

2. Implement Policy and Regulatory Measures

- a) Review existing legislation related to food waste in both countries
- b) Draft and propose new laws or amendments to strengthen food waste reduction efforts
- c) Implement further tax incentives for businesses donating food
- d) Develop standardized methodologies for measuring food waste across different sectors
- e) Establish a regulatory framework for food safety in donation processes

3. Engage the Food Industry

- a) Organize sector-specific workshops to introduce the voluntary agreement concept
- b) Draft and circulate voluntary agreement templates for different industry segments
- c) Provide technical support for implementing food waste tracking systems in businesses
- d) Collaborate with packaging companies to develop innovative, waste-reducing solutions
- e) Recognize and reward businesses demonstrating significant progress in reducing food waste

4. Enhance Food Donation Infrastructure

- a) Conduct a needs assessment for food donation infrastructure in major cities
- b) Secure funding for establishing food waste hubs, following Milan's successful model
- c) Develop and launch a digital platform connecting food donors with recipients
- d) Provide grants and technical support for equipping food banks and intermediaries
- e) Train staff and volunteers in proper food handling and distribution practices

5. Educate and Raise Awareness

- a) Develop comprehensive, sector-specific guidelines for food waste reduction
- b) Design and launch a multi-channel public awareness campaign
- c) Create educational materials for schools and integrate them into existing curricula
- d) Organize community events and workshops on food waste reduction techniques
- e) Leverage social media and influencers to spread the message, especially to younger audiences

6. Foster Innovation and Research

- a) Allocate funding for research projects focused on food waste reduction
- b) Organize annual hackathons or innovation challenges to address specific food waste issues
- c) Establish partnerships with universities to conduct applied research
- d) Create an incubator program for startups developing food waste reduction technologies
- e) Facilitate knowledge transfer between research institutions and the food industry

7. Monitor, Evaluate, and Adapt

- a) Develop a standardized food waste audit protocol for different sectors
- b) Conduct regular audits and collect data from participating stakeholders
- c) Analyze data to identify trends, challenges, and opportunities
- d) Publish annual progress reports, highlighting successes and areas for improvement
- e) Convene stakeholder meetings to review progress and adjust strategies as needed

Challenges and Barriers in Stakeholder Engagement

Stakeholder engagement is crucial in reducing food waste, but it comes with numerous challenges and barriers, particularly in countries like Italy and Croatia. Both nations have made significant strides in addressing food waste, yet they face unique obstacles in their efforts to engage various stakeholders effectively.

Despite the clear benefits of stakeholder collaboration, barriers still exist, for instance:

1. Structural & Policy Challenges

- Lack of standardized policies across regions.
- Unclear food donation laws leading to food disposal instead of redistribution.
- Limited funding for food waste initiatives.

2. Logistical & Infrastructure Barriers

- Inadequate storage & transport systems for perishable goods.
- High operational costs for surplus food redistribution.
- Retailers discarding edible food due to packaging and aesthetic standards.

3. Behavioral & Cultural Challenges

- Consumer habits of over-purchasing and misunderstanding expiration labels.
- Fear of legal liability when donating food.
- Low public awareness of food waste's environmental impact.

Understanding these barriers allows us to design targeted solutions.

One of the primary challenges in both Italy and Croatia is the lack of adequate public participation in food waste reduction initiatives. The analysis conducted by the Italian Observatory on Food Surplus, Recovery, and Waste (OERSA) pointed out that insufficient public participation is a significant obstacle to food waste prevention¹⁴. This challenge is not unique to Italy but is also prevalent in Croatia, where engaging the general public in food waste reduction efforts remains an ongoing struggle.

Another major barrier to stakeholder engagement is the perception of high costs associated with implementing food waste reduction measures. Many businesses and individuals in both countries view food waste prevention initiatives as financially burdensome, which discourages active

¹⁴ <https://www.frontiersin.org/journals/nutrition/articles/10.3389/fnut.2021.787982/full>



participation¹⁵[1]. This perception can be particularly challenging to overcome in smaller businesses and households with limited resources.

Paradoxically, one of the challenges in stakeholder engagement is inadequate stakeholder engagement itself. In both Italy and Croatia, there have been instances where not all relevant parties were effectively involved in the decision-making processes related to food waste reduction. This lack of comprehensive engagement can lead to policies and initiatives that do not fully address the needs and concerns of all stakeholders. Stakeholders in both countries often face uncertainty regarding the effectiveness of food waste policies. This uncertainty can lead to hesitation in fully committing to and implementing food waste reduction measures. The lack of clear, measurable outcomes can make it difficult for stakeholders to justify the time and resources required for engagement¹⁶.

In Italy, despite having progressive legislation like the Gadda law, which provides tax incentives for food donation, the complexity of regulations can be a barrier to stakeholder engagement. Some businesses and organizations may find it challenging to navigate the legal framework, potentially discouraging participation in food waste reduction initiatives. Both Italy and Croatia face logistical challenges in their food donation systems. In Croatia, the inability to identify intermediaries in the food donation chain has been identified as one of the main obstacles to food donation¹⁷. This barrier can discourage potential donors from participating in food waste reduction efforts. In Croatia, there is a disparity between the supply and demand for food, which increases from central to peripheral parts of the country. This uneven distribution of resources poses a significant challenge in engaging stakeholders across different regions effectively. Both countries face challenges in raising awareness and educating stakeholders about food waste issues. In Croatia, the National Food Waste Prevention Plan 2019-2022 highlighted the need for educating pre-school and school-age children and professional training of educational staff¹⁵. This indicates a gap in knowledge and awareness that needs to be addressed to improve stakeholder engagement.

To address these challenges, both Italy and Croatia are focusing on improving communication among stakeholders. Croatia, for instance, is developing a Platform for Receiving and Distributing Donations to enable networking of all stakeholders involved and facilitate transparent distribution of donations¹⁵.

Italy's OERSA has been working on developing comprehensive guidelines for different sectors of the food supply chain. These guidelines aim to provide practical solutions and clarify regulations, making it easier for stakeholders to engage in food waste reduction efforts¹⁸. Both countries are exploring

¹⁵ <https://circulareconomy.europa.eu/platform/en/news-and-events/all-news/legal-and-economic-barriers-food-loss-and-food-waste-prevention-survey-foodrus>

¹⁶ https://food.ec.europa.eu/document/download/97fdd2e8-d3a3-4a1b-8df3-a9bdc852bddf_en?filename=fw_lib_fwp-strat_national-strategy_hrv_en.pdf

¹⁷ https://food.ec.europa.eu/document/download/97fdd2e8-d3a3-4a1b-8df3-a9bdc852bddf_en?filename=fw_lib_fwp-strat_national-strategy_hrv_en.pdf

¹⁸ <https://www.frontiersin.org/journals/nutrition/articles/10.3389/fnut.2021.787982/full>



technological solutions to enhance stakeholder engagement. Croatia has developed an IT system (e-donation) to improve the food donation process and make it more accessible to various stakeholders.

The city of Rijeka in Croatia provides an inspiring example of multi-stakeholder collaboration. The Rijeka Food Council, formed under the Fusilli project, brings together diverse stakeholders from city departments, waste management, and the hospitality sector to tackle food waste collectively¹⁹. The example set by Rijeka's collaborative approach to developing food waste reduction guidelines offers a promising model for other cities and regions. By bringing together diverse stakeholders and creating practical, locally-tailored solutions, both Italy and Croatia can overcome the barriers to effective stakeholder engagement and make significant strides in reducing food waste.

Moving forward, both countries need to continue focusing on improving communication, simplifying regulations, leveraging technology, and fostering multi-stakeholder collaboration. By addressing the perceived high costs and uncertainties associated with food waste reduction initiatives, they can encourage greater participation from all sectors of society.

Future Directions and Conclusion

As the global population grows, food waste reduction will become even more critical. Future efforts should focus on:

- ✓ Smart Technology Adoption – AI-driven food supply chain optimization.
- ✓ Circular Economy Models – Repurposing food waste for biofuels and animal feed.
- ✓ Pan-European Collaboration – International agreements on food waste reduction.

By enhancing stakeholder engagement, integrating policy, technology, and consumer action, we can create a sustainable and waste-free food system.

¹⁹ <https://fusilli-project.eu/general/riekas-bold-move-to-tackle-food-waste-a-collaborative-journey/>

