Governance Challenges on Food Loss and Waste (FLW) Reduction in Indonesia

Sidik Pramono[1], Sarah Anggraeni Suhartono[2]
[1]Universitas Indonesia, Depok, Indonesia
[2]Diksi Strategic, Indonesia
[1]sidik.pramono18@ui.ac.id

Abstract

Indonesia's commitment to reducing food loss and waste (FLW) is hindered by a governance gap that transforms a technical issue into a structural one. This study analyses the systemic barriers within Indonesia's regulatory framework through a public administration and governance lens. The findings of this research reveal that institutional fragmentation remains the core obstacle, with silo effect among agencies resulting in weak cross-sectoral coordination. This lack of integration leads to inconsistent data and misalignment between central and regional governments, as well as disconnection from non-state actors. Ultimately, FLW reduction in Indonesia cannot be solved by isolated technical fixes. It requires a collaborative governance transformation that synchronizes authority and integrates policy execution across the food system chain.

Keywords: Food Loss and Waste; FLW Reduction; Policy; Governance; Challenges

Introduction

Sustainable development serves as a global response to ecological pressure, social inequality, and uncontrolled exploitation of natural resources, operating on the principle that current progress must not jeopardize future generations. This paradigm relies on three inseparable pillars: economic growth, social justice, and environmental protection (Purvis et al., 2019). Effective waste management is a primary challenge within this framework, as economic activities are bound by environmental carrying capacity. Addressing this requires moving beyond isolated efforts toward a coordinated, multi-sectoral approach.

Success depends on effective policies that harmonize government, industry, and civil society to incentivize innovation and investment in sustainable waste technologies (Roy et al., 2023). One form of waste that has received serious international attention is FLW. The United Nations, through the United Nations Environment Programme, has emphasized that food waste is a significant contributor to the global environmental crisis because it produces greenhouse gas emissions, particularly methane from landfills, and leads to the waste of natural resources such as water, energy, and land for food production (Forbes et al., 2021).

FLW not only represents failure in the food consumption system but also reflects systemic inefficiencies in the global food production, distribution, and consumption chain. Therefore, the issue of FLW is increasingly viewed as a strategic issue directly related to food security, economic efficiency, and environmental sustainability (Santeramo and Lamonaca, 2021). The urgency of FLW reduction is increasingly relevant within the framework of the Sustainable Development Goals (SDGs), particularly Goal 12 on Responsible Consumption and Production.

Refer to Transforming our World: The 2030 Agenda for Sustainable Development reported by United Nations (2015), Target 12.3 of the SDGs explicitly emphasizes halving global per capita food waste at the retail and consumer levels and reducing food

losses throughout the production and distribution chain by 2030. Therefore, FLW reduction is no longer understood as a purely technical waste management issue, but rather as an agenda for transforming food system governance that requires policy integration across sectors, actors, and levels of government. High Level Panel of Experts on Food Security and Nutritiom emphasized that FLW is closely related to the entire food system, from production to consumption and waste management, thus requiring a systemic and collaborative approach (Vishweshwaraiah et al., 2014).

In the Indonesian context, the challenge of FLS is becoming increasingly complex due to the high national waste generation and limited management capacity. Official data from Ministry of Environment (2025) indicates that organic waste, derived mostly from food scraps, dominates the approximately 53 million tons of annual waste (Kaza et al., 2018). A synthesis of recent research, however, reveals a significant disconnect between the scale of the problem and the governance mechanisms intended to solve it. Current literature predominantly frames FLW as a byproduct of individual or household inefficiencies.

Studies by Kusumawardani et al., (2023); and Aulia (2025) highlight psychological and cultural drivers at the consumption stage, such as suboptimal meal planning and low awareness. However, focusing solely on behavioural patterns obscures the broader economic implications. The massive economic losses that estimated by Leksono and He (2025) at up to 4-5% of Indonesia's GDP, suggests that FLW is a structural impediment to national economic efficiency and sustainable food security. Indonesia’s regulatory response, anchored by Law 18/2008 and Presidential Regulation 97/2017, sets ambitious targets for waste reduction.

Yet, a critical review of these policies suggests they suffer from what Candel and Biesbroek (2016) describe as a failure of policy integration. The existing framework remains trapped in a sectoral silo, where mandates are scattered across environmental, agricultural, and trade agencies. This fragmentation leads to weak institutional coordination: Conflicting priorities between agencies that prioritize production versus those focused on post-harvest management. Furthermore, implementation gaps persist due to the mismatch between national strategy and the technical or financial capacity of regional governments to execute integrated waste management.

A significant gap exists in the prevailing literature. There is a lack of critical inquiry into governance architecture, specifically how inter-actor relationships and institutional power dynamics determine policy success. As noted by Bryson et al., (2006); and Ostrom (1990) effective public policy in complex environments depends on the quality of governance, which involves interactions between the state, the private sector, and civil society, as well as the ability of the various actors to work collectively to achieve common goals. In the Indonesian context, FLW reduction is not merely a technical problem but a governance challenge requiring a shift from fragmented sectoral management to a synchronized, multi-stakeholder ecosystem. This study, therefore, shifts the focus from what is being wasted to how the institutional framework fails to prevent that waste through integrated policy execution.

Method

This study employs a qualitative, descriptive-normative design to examine Indonesia’s FLW governance. The qualitative approach was chosen because it allows for in-depth exploration of the meaning, dynamics, and theoretical constructions of social phenomena and public policy (Creswell, 2018; Denzin, 2018). To ensure a systematic evaluation, the study applies to a public administration framework relevant regulations, policies, and official documents, thus enabling a more comprehensive understanding of

the dynamics that occur Pollitt (2017) including looking at identifying potential gaps and challenges in governance implementation. Data were synthesized from regulatory documents (e.g., Law 18/2008, PR 97/2017), official policy reports, and peer-reviewed literature. This dual approach contrasts the de jure regulatory framework with de facto implementation gaps, identifying the structural barriers that transform technical FLW issues into persistent governance failures.

Results and Discussion

1. FLW Policies in Indonesia

Indonesia, as a country with a complex food system, faces significant FLW challenges at both the production (food loss) and consumption (food waste) stages. The Food and Agricultural Organization 2013 Report and the United Nations Environment Programme 2021 Report both points to Indonesia as one of the countries in the developing world with substantial FLW levels. A 2021 report from the National Development Planning Agency Ministry of National Development Planning Republic of Indonesia (2021) also indicates that the volume of FLW in Indonesia is relatively high and has serious implications for economic losses, food security, and environmental impacts, including greenhouse gas emissions and resource waste. The regulatory framework for food waste management in Indonesia demonstrates a multi-level and integrated legal structure in the areas of environmental protection and waste management.

Table 1. List of Waste Management Policies in Indonesia

Type of Regulation	Name
Law	• Law Number 18 Year 2008 concerning Waste Management. • Law Number 32 Year 2009 concerning Environmental Protection and Management.
Government Regulation	• Government Regulation Number 81 Year 2012 concerning Management of Household Waste and Waste Similar to Household Waste. • Government Regulation Number 27 Year 2020 concerning Specific Waste Management. • Government Regulation Number 22 Year 2021 concerning Implementation of Environmental Protection and Management.
Regulation/Presidential Decree, Ministerial Decree	• Presidential Regulation Number 97 Year 2017 concerning the National Policy and Strategy for the Management of Household Waste and Household-Like Waste. • Regulation of the Minister of Environment and Forestry Number 75 Year 2019 concerning the Roadmap for Waste Reduction by Producers. • Regulation of the Minister of Home Affairs Number 33 Year 2010 concerning Guidelines for Waste Management. • Regulation of the Minister of Public Works and Public Housing Number 03/PRT/M/2013 concerning the Implementation of Waste Infrastructure and Facilities.

	• Regulation of the Minister of Environment and Forestry Number 10 Year 2018 concerning Guidelines for the Formulation of Regional Waste Management Policies and Strategies.
Regional Regulation/Regional Head Regulation	• Governor Regulation of the Special Region of Yogyakarta Province No. 21 Year 2014 concerning Guidelines for Waste Management, Waste Management Business Licensing, and Environmental Compensation. • DKI Jakarta Governor Regulation No. 142 Year 2019 concerning the Mandatory Use of Eco-Friendly Shopping Bags in Shopping Centers, Supermarkets, and Traditional Markets. • Bali Governor Regulation No. 97 Year 2018 concerning Limiting the Generation of Single-Use Plastic Waste. • Bandung City Regional Regulation No. 9 Year 2018 concerning Waste Management. • Surabaya Mayor Regulation No. 1 Year 2019 concerning Reducing the Use of Plastic Bags, which also relates to waste reduction in the retail and food sectors. • Sidoarjo Regent Regulation No. 52 Year 2017 concerning Guidelines for Training Waste Management Cadres in Sidoarjo Regency. • Batu Mayoral Regulation Number 66 Year 2020 concerning Management of Household Waste and Household-Like Waste.

The current regulatory landscape in Indonesia reflects a deep-seated institutional fragmentation where FLW is treated as a generic waste issue rather than a specific food system failure. While Law 18/2008 and PR 97/2017 establish broad reduction targets, authority is scattered across the Ministry of Environment (KLHK) for reduction, Ministry of Public Works (PUPR) for infrastructure, and Ministry of Home Affairs for regional guidance. This creates policy incoherence, as seen in the disconnect between KLHK's "Producer Waste Roadmaps" (Permen LHK 75/2019) and regional regulations that often prioritize downstream plastic bans (e.g., Bali Gov Reg 97/2018) over upstream organic waste prevention.

Without a singular legal mandate for food loss specifically, agencies operate in silos, leading to over-regulation of waste processing but under-regulation of the food supply chain itself. Consequently, coordination failures manifest as a persistent mismatch between national ambition and local execution. While central regulations like PP 81/2012 demand integrated management, the vertical flow of authority is diluted by varying regional capacities and conflicting ministerial guidelines (e.g., Permendagri 33/2010 vs. Permen PUPR 03/2013). Local governments often focus on visible waste, such as shopping bag bans in Jakarta or plastic limits in Surabaya, because the governance architecture lacks a synchronized mechanism to address the more complex, but invisible logistics of food surplus redistribution. This ensures that FLW remains a localized, technical problem managed through fragmented municipal ordinances rather than a unified national strategy.

2. Ecosystem and Actor Relations

Addressing FLW is not merely a sectoral issue, but an integral part of the sustainable development agenda, demanding cross-sectoral policy coherence. According to Meuleman and Niestroy (2015) achieving sustainable development goals depends on the ability to flexibly and reflectively integrate various actors, sectors, and levels of government, while avoiding a uniform policy approach. This aligns with the FLW reduction target, which also requires the active participation of various stakeholders. Each stakeholder group plays a crucial role in creating an efficient and sustainable food system.

Stakeholder engagement includes government, the private sector, civil society, academia, international organizations, and local communities. Ministry of National Development Planning Republic of Indonesia (2021) has identified a complex network map of entities involved in various stages of the food cycle, from production and post-production processing, transportation, storage, distribution, to consumption and processing of FLW. This cross-ministerial and institutional involvement underscores the importance of intersectoral collaboration to ensure the efficiency and sustainability of programs that simultaneously minimize FLW and strengthen the circular economy.

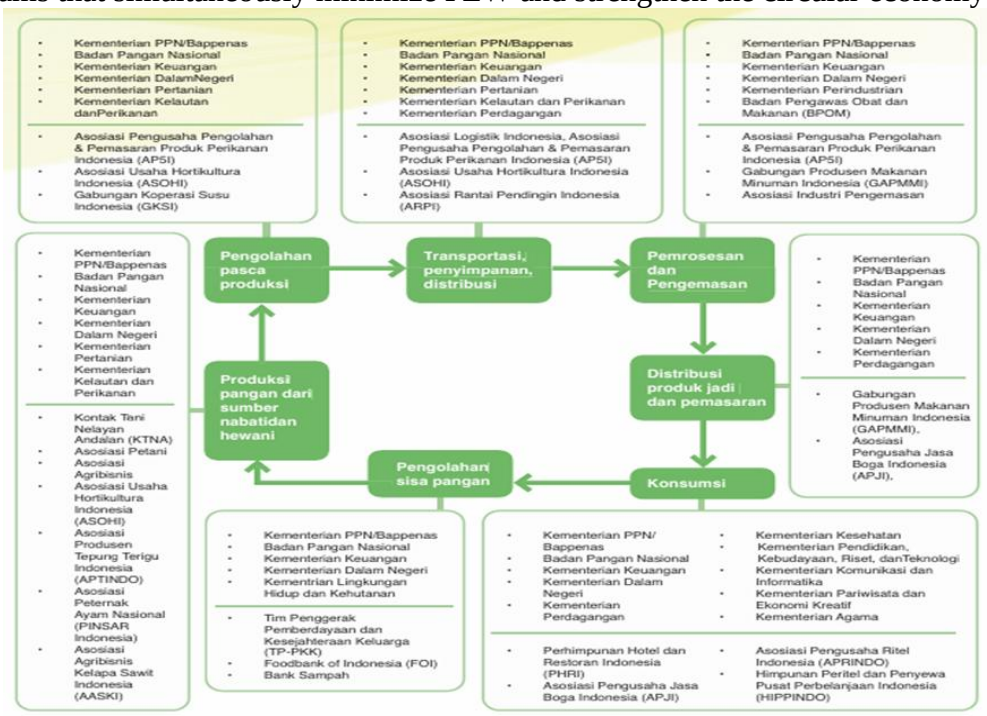

Figure 1. FLW Management Ecosystem in Indonesia
(Source: Bappenas, 2021)

The FLW reduction ecosystem map demonstrates the complexity of the issue, as well as a deep asymmetry of power and interests that undermines policy coherence. Applying a governance network perspective reveals that while the National Food Agency (NFA) was established by Presidential Regulation 66/2021 to act as a central orchestrator. Its effectiveness is challenged by entrenched institutional legacies and conflicting actor mandates. In fact, the effectiveness of FLW reduction is largely determined by the ability of public institutions to build collaborative governance mechanisms capable of synergizing actors throughout the food system, from production, distribution, consumption, to food waste management (Papargyropoulou et al., 2014). Distributed authority within the FLW governance ecosystem remains insufficiently aligned across actors, generating persistent institutional and operational tensions.

A primary conflict of interest exists between the NFA's mandate for food stability and the Ministry of Agriculture's focus on production volume. Traditionally, high

production targets ignore post-harvest losses, creating a structural blind spot. Furthermore, the NFA may lack teeth to compel older, established ministries (like the Ministry of Public Works or Ministry of Environment) to prioritize food-specific infrastructure over general waste management. Simultaneously, relations between the state and the private sector remain largely compliance driven.

In the governance network, the private sector (retailers and industry) prioritizes logistical efficiency and profit margins. Current regulations, such as the Roadmap for Waste Reduction (Permen LHK 75/2019), impose responsibilities on producers without providing sufficient incentives for surplus redistribution. This creates a compliance-only dynamic rather than a transformative partnership. In addition, civil society and food communities, despite possessing substantial social capital and playing critical role in food redistribution (e.g., food banks), continue to operate on the periphery of the governance network. They possess high social capital but low institutional power.

Furthermore, the NFA's role as a central orchestrator remains largely normative and symbolic. Critically, its capacity is hampered by two main factors, with its institutional effectiveness constrained by persistent coordination and jurisdictional challenges. First, significant vertical coordination gaps exist wwhile the NFA operates at the national level, the actual execution of FLW policy occurs at the regency/city level. The NFA has limited direct authority over regional governors and mayors, who often prioritize more visible urban sanitation issues over invisible food loss in the supply chain. Second, the NFA enters a crowded field where the Ministry of Environment already claims authority over waste and the Ministry of Trade claims authority over distribution.

This results in a clash of sectoral logic: the NFA views FLW through the lens of food security, whereas other agencies view it through waste volume or market price control, thereby weakening policy coherence and inter-agency coordination. Ultimately, the NFA faces the “coordinator's dilemma” that tasked with integrating a system where it has the responsibility for the outcome but lacks the hierarchical power to dictate the actions of its peer ministries. Without a transition from a hierarchical, “command-and-control” mindset to a collaborative governance model as one that aligns the economic incentives of the private sector with the social mandates of the state. The NFA risks becoming another layer of bureaucracy in an already fragmented system.

3. Governance Challenges

The governance of FLW in Indonesia is currently characterized by systemic silos, where high-level regulatory ambition is consistently neutralized by empirical failures in institutional execution. Moving beyond theoretical repetition, a synthesis of the current landscape reveals four concrete forms of governance failures in policy execution and coordination. The current governance landscape reveals several interconnected deficiencies, including that there is no single source of truth for FLW data. The Ministry of Environment (KLHK) tracks waste volume at landfills, while the Ministry of Agriculture focuses on production loss, and the NFA monitors food security.

This fragmented data prevents the formulation of a synchronized baseline, leading to misaligned interventions that treat symptoms (waste) rather than causes (logistical inefficiencies). These weaknesses are compounded by substantial vertical coordination gaps between the central and regional governments, as the capacity gap. While the central government sets reduction targets (e.g., PR 97/2017), weak central-regional coordination creates an implementation vacuum. Local governments often lack the fiscal space and technical expertise to move beyond basic “collect-and-dump” waste management. Consequently, national FLW mandates are often ignored in regional development plans (RPJMD) in favor of more immediate political priorities. In addition, the involvement of

the private sector and civil society remains transactional rather than transformative, limiting the emergence of integrated multi-stakeholder governance capable of addressing FLW comprehensively across the supply chain.

Comparative governance from other countries as lessons to address Indonesia's structural gaps, demonstrate that effective FLW governance depends on integrated, multi-actor institutional arrangements capable of overcoming sectoral fragmentation. Japan has a statutory collaboration governance model. Its Food Recycling Law synchronizes the Ministry of Agriculture and the Ministry of Environment. It mandates business-to-business recycling loops, showing that FLW requires joint ministerial accountability rather than a single "lead" agency (Okayama and Watanabe, 2024).

France, meanwhile, has a regulatory compulsion governance model whereby it prohibits supermarkets from destroying edible food, hence moving FLS from a charity issue to a mandatory redistribution issue. This addressed Indonesia's need for a regulatory framework that compels the retail sector to integrate with social safety nets (Garrone et al., 2014). In contrast, Netherlands employs a governance network initiative where the state acts only as a facilitator for industry-led innovation and incentivizes the private sector to optimize supply chain (Principato, 2018). Similarly, Singapore has multi-actor synergy model where it integrates NGOs like the Food Bank Singapore in urban planning and food security strategy.

Civil society organizations such as The Food Bank Singapore, SG Food Rescue, and volunteer-based food communities play an active role in connecting surplus food from the retail, hotel, restaurant, and household sectors to vulnerable groups This model can serve as a blueprint on how non-state actors can be utilized as critical logistical partners rather than peripheral charities (Rut et al., 2021). In the Indonesian context, the NFA occupies a strategic position as a central orchestrator that must consolidate diverse actors with different mandates, interests, and capacities so that FLW reduction interventions can be integrated from upstream to downstream.

Its challenge is to evolve from a normative coordinator to a functional integrator. To overcome its structural inefficiency, the NFA must move beyond issuing guidelines and focus on building a collaborative governance ecosystem that links the interests, role, and capability of the state, market, and society to ensure integrated and cohesive FLW initiatives. The effectiveness of FLW reduction depends heavily on the state's capacity to build a collaborative ecosystem capable of integrating the private sector, civil society organizations, food communities, philanthropic institutions, academics, and household consumers into the national food policy framework (Reynolds et al., 2019).

Conclusion

This study concludes that Indonesia's struggle FLW is a crisis of governance, not just a technical failure of the food system. The research makes a distinct contribution by shifting the discourse from waste quantification to the structural dynamics of institutional fragmentation and authority misalignment. We find that despite an extensive regulatory framework, the "silo effect" between ministries and the vertical disconnect between central and regional governments creates a vacuum where policy ambition meets implementation failure. The primary contribution of this research is the identification of the coordinator's dilemma facing the NFA. As the designated orchestrator, the NFA possesses regulatory legitimacy but lacks the functional authority to bridge data fragmentation or compel cross-sectoral compliance. For FLW reduction to succeed, Indonesia must transition from a command-and-control hierarchy to a collaborative governance ecosystem, incentivize the private sector, and move beyond symbolic coordination to a model of joint accountability among state and non-state actors. While

this study provides a normative and structural foundation, its reliance on qualitative literature review leaves room for empirical expansion. Future research should prioritize sub-national case studies to analyze the specific capacity gaps in regencies that hinder the localization of national targets; conduct policy network analysis to map informal power relations and resource dependencies between the NFA and legacy ministries; and undertake implementation evaluation to assess the real-world impact of the NFA's coordinating mechanisms on the ground as they evolve post-2024.

References

Aulia, S. M. (2025). Household Food Waste Behavior And Multidimensional Consumption Patterns In Indonesia. *Journal of Environmental Policy and Sustainability*, *7*(1), 963-974.

Bryson, J. M., Crosby, B. C., & Stone, M. M. (2006). The Design and Implementation of Cross-Sector Collaborations: Propositions from the Literature. *Public Administration Review*, *66*(1), 44-55.

Candel, J. J. L., & Biesbroek, R. (2016). Toward A Processual Understanding Of Policy Integration. *Policy Sciences*, *49*(3), 211-231.

Creswell, J. W., & Poth. C. N. (2018). *Qualitative Inquiry And Research Design: Choosing Among Five Approaches*. London: SAGE Publications.

Denzin, N. K., & Lincoln, Y. S. (2018). *The SAGE Handbook Of Qualitative Research*. London: SAGE Publications.

Forbes, H., Quested, T., & O'Connor, C. (2021). *Food Waste Index Report 2021*. UN Evironment Programme.

Garrone, P., Melacini, M., & Perego, A. (2014). Opening The Black Box Of Food Waste Reduction. *Food Policy*, *46*, 129-139.

Kaza, S., Yao, L. C., Bhada-Tata, P., Van Woerden, F., & Levine, D. (2018). *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050*. Washington, DC: World Bank.

Kusumawardani, D., Hidayati, N. A., Martina, A., Agusti, K. S., Rahmawati, Y., Amalia, Y. Y., & Ramdaniyah, N. F. (2023). Household Food Waste in Indonesia: Macro Analysis. *Polish Journal of Environmental Studies*, *32*(6), 5651-5658.

Leksono, A. B., & He, Y. (2025). Reducing Food Waste in Indonesia: Examining the Moderating Roles of Impulsive Buying and Value-Seeking in Discount Strategies. *Sustainability*, *17*(2), 747.

Meuleman, L., & Niestroy, I. (2015). Common But Differentiated Governance: A Metagovernance Approach to Make the SDGs Work. *Sustainability*, *7*(9), 12295-12321.

Ministry of National Development Planning Republic of Indonesia. (2021). *Food loss and waste in Indonesia: Final Report*.

Okayama, T., & Watanabe, K. (2024). Performance of the Food Waste Recycling Law in Japan with Reference to SDG 12.3. *Recycling*, *9*(1), 1-18.

Ostrom, E. (1990). *Governing The Commons*. Cambridge: Cambridge University Press.

Papargyropoulou, E., Lozano, R. K., Steinberger, J., Wright, N., & Ujang, Z. B. (2014). The Food Waste Hierarchy As A Framework For The Management Of Food Surplus And Food Waste. *Journal of Cleaner Production*, *76*, 106-115.

Pollitt, C., & Bouckaert, G. (2017). *Public Management Reform: A Comparative Analysis*. Oxford: Oxford University Press.

Principato, L. (2018). *Food Waste at Consumer Level*. Cham: Springer International Publishing.

Purvis, B., Mao, Y., & Robinson, D. (2019). Three Pillars Of Sustainability: In Search Of Conceptual Origins. *Sustainability Science*, *14*(3), 681-695.
Reynolds, C., Goucher, L., Quested, T., Bromley, S., Gillick, S., Wells, V. K., Evans, D., Koh, L., Kanyama, A. C., Katzeff, C., Svenfelt, Å., & Jackson, P. (2019). Review: Consumption-Stage Food Waste Reduction Interventions-What works and how to design better interventions. *Food Policy*, *83*, 7-27.
Roy, S., Rautela, R., & Kumar, S. (2023). Towards A Sustainable Future: Nexus Between The Sustainable Development Goals And Waste Management In The Built Environment. *Journal of Cleaner Production*, *415*, 137865.
Rut, M., Davies, A. R., & Huiying, N. (2021). Participating In Food Waste Transitions: Exploring Surplus Food Redistribution In Singapore Through The Ecologies Of Participation Framework. *Journal of Environmental Policy & Planning*, *23*(1), 34-47.
Santeramo, F. G., & Lamonaca, E. (2021). Food Loss-Food Waste-Food Security: A New Research Agenda. *Sustainability*, *13*(9), 4642.
Vishweshwaraiah, P., Ambuko, J., Belik, W., Huang, J., & Timmermans, A. (2014). *Food Losses And Waste In The Context Of Sustainable Food Systems*. Roma: FAO (Food and Agriculture Organization of the United Nations)