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The Legal Regulation of Food Waste Management: A Comparative Study of the United States, France, and South Korea

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Abstract. Food waste has become a pressing global challenge with significant environmental, economic, and social implications, demanding urgent and coordinated legal responses. The author conducts a comparative analysis of the rules and laws governing food waste reduction and food waste management in the United States, France, and South Korea, three jurisdictions that have adopted distinctive regulatory approaches to this pressing global issue. By examining the legal frameworks, policy instruments, and enforcement mechanisms employed in each country, the study identifies both common principles and divergent strategies in addressing food waste. The comparison encompasses key aspects such as reduction targets, disposal restrictions, recycling requirements, and liability allocation. Drawing on these existing rules and their implementation outcomes, the author proposes development suggestions for future global food waste-related laws, aiming to inform the formulation of more effective and harmonized legal responses to food waste at the international level and to support sustainable food systems worldwide.

Keywords: Food waste, food loss, waste management, waste recycle, comparative law

1. Introduction

Even today, food loss and unequal access to adequate nutrition persist and remain intractable social problems. According to a 2026 report jointly released by Food and Agriculture Organization of the United Nations (FAO), International Fund for Agricultural Development (IFAD), United Nations Children's Fund (UNICEF), World Food Programme (WFP), and World Health Organization (WHO), approximately 645 million people suffered from hunger in 2025, and "an estimated 25.8 percent of the global population--2.1 billion people--were moderately or severely food insecure [1]."

In the following study, the author examines relevant legislation, review official reports and academic literature, and conduct comparative analysis to discuss how global laws address food waste and the management and disposal of discarded food. The author also examines and compares the effects of different laws, comparing who bears the relevant legal obligations in different countries, how their implementation is monitored, whether the enforcement process supports these obligations, whether it reduces avoidable waste, and whether it mitigates the various negative impacts of food waste management. This discussion includes the United States, France, and South

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Korea. Finally, the authors offer recommendations and future prospects based on the existing findings.

2. Current status of food waste and food waste management

2.1. Facts about current global food waste

According to United Nations Environment Programme (UNEP)'s Food Waste Index Report 2024, approximately 1.05 billion metric tons of food waste were generated in 2022, which equals to 19% of food available for consumers were wasted. And in this waste, households accounted for approximately 60 percent of the total, which is 631 million tons of food. That means households at least wasted one billing meals, and each person at least wasted 79kg of food annually. This wasted food could have been provided as 1.3 meals a day to those in hunger. Regarding earlier stages of the supply chain, due to UNEP, there were about 290 tons of food waste produced during food service sector and estimated 131 tons of waste from the retail sector. However, despite food waste being a serious global social problem, according to a UNEP report, as of 2022, only 21 countries worldwide had incorporated food waste reduction into their national environmental programs. Therefore, comparing and analyzing how different countries are reducing food waste at the legal level is crucial for identifying potentially better solutions in the future. This is also the topic the authors focus on in this study [2].

2.2. Facts about current global food waste management

Regarding food waste management, the most widely used disposal methods globally, including in the United States, are landfill or incineration. However, landfilled food waste is decomposed under anaerobic or anaerobic conditions, which produces methane. According to a 2023 research report released by the U.S. Environmental Protection Agency Office of Research and Development (EPA), in 2020, the carbon dioxide equivalent emitted by food waste in U.S. municipal landfills was approximately 55 million tons; and about 58% of the methane emitted into the atmosphere from U.S. municipal landfills came from food waste, which means an estimated 34 metric tons of fugitive methane being released for every 1,000 tons of food waste landfilled [3]. Also, if food waste flows into the sewers as sewage, it will further pollute the city's water supply and even the groundwater system [4]. Undoubtedly, these greenhouse gases have a huge impact on the environment and also reflect the inadequacy of common contemporary food waste management methods. In order to to mitigate the environmental negative impacts of food waste management, a comprehensive regulatory framework is necessary.

3. Laws concerning food waste and food surplus

3.1. The United States

To encourage those with surplus food to donate, the United States federal Bill Emerson Good Samaritan Food Donation Act, codified at Title 42 U.S.C. § 1790, § 1791, and § 1792, defines those who collect crops for free distribution to those in need, or for donation to nonprofit organizations for eventual distribution to those in need, as "gleaners". It provides civil and criminal liability protections to qualified donors, nonprofit recipients, and gleaners who donate food that is clearly fit for consumption; however, gross negligence or willful misconduct is not protected [5]. These provisions remove a legal barrier to donation, encouraging donors to donate food by reducing legal

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risks, but do not mandate that businesses or individuals donate surplus food or penalize food waste, nor do they require enterprises to first establish measures to prevent surplus food generation. The effects of legal permission and legal requirement on behavior can differ; while U.S. rules appear to incentivize food donation, they lack the necessary binding force on preventing food waste or more strengthened protection on donators.

However, U.S. legislation addressing food waste still faces several evident and academically recognized problems. Due to the national system, unique state laws are often the prevailing rules in each state. According to research by Kakadellis and Sarah et al., the U.S. goal of reducing food loss and waste aims to reduce national food waste by 50% to 74 kg per capita by 2030. However, tests of the effectiveness of state policies show that no state has been able to meet the federal target based solely on its own policies [6]. Without additional interventions or preventative regulations at the state and federal levels to shift the focus from food waste recycling and donations to prevention, remediation, and reuse, food waste in the U.S. is likely to remain high.

3.2. France

Compared to the United States, French law, located in Europe, has established more explicit rules. Code de l'environnement L. 541-15-3 not only explicitly requires catering and agricultural operators to assess the quantity and cost of potential food waste but also limits their procurement quantities to reduce potential waste. Article L.541-15-4 prioritizes preventing food waste, followed by using unsold, still-fit for human consumption through donation or processing, and only then considers animal feed, compost, or energy recovery. L.541-15-5 further prohibits any food distributor, wholesaler, production and processing enterprise, and catering operator from improperly disposing of unsold or still human-edible food without addressing food safety issues. L.541-15-6 requires large-scale food-related enterprises to sign agreements with food donation recipients, specifying donation quality and monitoring the food donation process to meet agreement requirements.

Compared to the United States, France's rules on preventing food waste are clearly more proactive and stringent. They not only include clear guiding provisions for prevention and mitigation, but also mandatory rules requiring businesses to comply with these rules, with criminal penalties as punishment.

3.3. South Korea

South Korea places particular emphasis on preventing food waste. Article 14 of Law on the Prevention of Food Waste stipulates that local governments are responsible for handling household waste and are allowed to charge fees based on the type and quantity of waste. Among these fees, the cost of food waste can be calculated based on the amount of waste discharged. Administration can use electronic information systems, and local governments are required to keep detailed records of the charges for food waste collection, otherwise they will face budget cuts. South Korean law assigns the responsibility for preventing and supervising food waste to the government, which indirectly emphasizes the cost of discarding food waste and amplifies the visibility of its supervision, but does not establish a general obligation to donate edible food.

Academic research has provided a more detailed explanation of the effectiveness of the South Korean system. Moon, Seo, and Cho used panel data from 229 local governments in South Korea from 2015 to 2021 and found that with the use of the specific technology, every percentage point increase in the adoption rate of the pay-as-you-go system reduced per capita food waste by 0.44 percentage points and per household food waste by 0.45 percentage points. This undoubtedly shows

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that the South Korean system is indeed effective in reducing food waste. However, if the collection service is inconvenient and the distribution of costs is not considered under social economic conditions and providing some accommodations due to potential poverty, higher fees may also affect some households and impose an economic burden on them.

4. Laws concerning food waste management

4.1. The United States

U.S. law restricts waste disposal methods, but federal law does not uniformly prohibit the landfilling or incineration of food waste nationwide. Title 40 Protection of the Environment, Chapter 1 Environmental Protection Agency, Subchapter 1 Solid Wastes, Part 258 Criteria for Municipal Solid Waste Landfills details the standards for municipal landfills, including but not limited to operational requirements, location requirements, site construction standards, monitoring requirements, and post-closure cleanup [7]. Large-scale waste incineration sites with a daily processing capacity exceeding 250 tons are also subject to emission standards and operating procedures required by the Environmental Protection Agency [8]. However, even with U.S. restrictions on waste incineration and landfilling, there is no requirement or encouragement to send every discarded food item for composting or anaerobic digestion.

Under federal requirements, each state in the United States also has its own relevant state laws. For example, Massachusetts imposes more direct restrictions on the management of food waste. Massachusetts' 310 CMR 19.000: Solid Waste Management requires that businesses or establishments that generate more than half a ton of commercial organic waste per week are prohibited from sending such materials to solid waste disposal facilities. However, when Anglou, Sanders, and Stamatopoulos studied the five states that first implemented food waste regulations, they found that only Massachusetts saw a statistically identifiable decrease in landfill waste during the period they examined from 1996 to 2019 [9]. Undoubtedly, under the federal legal framework, the different state laws on restricting food waste management methods will have different effects. Therefore, if states take into account their own circumstances and refer to and learn from the restrictive laws of states with better results to improve their own laws, it may further reduce food waste entering landfills.

4.2. France

France has legal conditions for the management of food waste, similar to those in the United States, but with stronger enforcement. Code de l'environnement, Article L541-2-1 requires waste producers and holders subject to it to follow a priority order of disposal, prioritizing donation, recycling, and lastly disposal, and stipulates that only "ultimate waste" (déchets ultimes) can go to landfills. "Déchets ultimes" refers to materials that can no longer be reused or recycled under the current technological and economic conditions. In France, businesses must comply with statutory sorting obligations and restrictions on food waste disposal. However, the French law obviously excludes households from supervision [10].

4.3. South Korea

South Korea's regulations restrict intervention in earlier stages of the food waste treatment chain. According to a report by The Global FoodBanking Network, since 2005, relevant city regulations

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have prohibited direct landfilling of food waste, requiring that untreated food waste not be sent directly to landfills like ordinary waste. As a result, the mainstream treatment method has become the recycling of food waste to produce livestock feed, compost, and anaerobic digestion. However, this has also created new problems, as it is difficult to find a reliable market for livestock feed and compost made from recycled food waste.

In recent years, South Korea's Law on the Prevention of Food Waste has set a specific food waste recycling method as a legal target. The law includes food waste in the category of organic waste resources and requires the competent authorities to set annual biogas production targets for specific public obligors starting in 2025 and for specific private obligors starting in 2026. According to the law, failure to meet the target may result in a fine. However, this is a measurable output obligation for legal entities and does not require that every kilogram of food waste be converted into biogas, nor does it make any requirements for the treatment of any residue that may remain after food waste is converted into biogas.

5. Comparison

Comparing the regulations on food waste reduction in the United States, France, and South Korea, the author finds that they focus on different directions and stages. The US primarily reduces the legal risks of food donations, thereby encouraging people to reduce food waste by donating surplus food; France establishes detailed and mandatory requirements for specific companies to reduce food waste and mandates their donation obligations; while South Korea urges local governments to charge management fees based on the amount of waste, emphasizing the cost of creating food waste to reduce its generation. The author finds that no single country's law can simultaneously and adequately cover household food surplus, corporate food surplus, and the stability of donation systems and safety of donated food. Strict donation obligations and legal protections for donors may shift the costs of handling non-compliant food surplus and food waste onto charities. While mandatory processing fees may make waste easier to identify and reduce, they cannot guarantee that edible surplus food actually reaches those who need it.

In addressing food waste, the laws of the United States, France, and South Korea intervene from three different angles. U.S. federal law primarily sets operational conditions for landfill and incineration facilities, with more detailed requirements set by individual states. France uses the recyclability of waste as a standard, requiring large-scale enterprises and related businesses to landfill food waste only when it cannot be recycled or reprocessed. South Korea directly prohibits food waste landfilling and requires large food waste producers to convert it into multi fixed amounts of biogas for reuse. In the author's view, restrictions on food waste landfilling and incineration, requirements and encouragement for recycling, and supervision of food waste managers in the enforcement of regulations are all crucial. While the laws of the U.S., France, and South Korea all address some aspects, they do not cover all.

6. Conclusion

Regarding the future direction of global food waste reduction and management regulations, the author proposes the following interconnected suggestions. First, encouragement and mandatory requirements for food donations should coexist, with further assistance provided to food donors and charities, such as assistance with refrigerated transport and financial support for disposing potentially substandard food items included in donations. This involves encouraging companies and individuals to donate surplus food through various forms of assistance and legal protection, ensuring

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the quality of donated food reaching those in need, and, like France, requiring companies generating large amounts of food waste to donate food and penalizing those ultimately producing excessive amounts. Second, regulations for reducing food waste should extend beyond businesses to include households. Governments can invest more in educating residents about food donation, food waste reducing and food waste recycling, and more strictly enforce (and even strengthen penalties for violations) rules to prevent food waste, such as garbage sorting and charging waste management fees based on volume. Starting with households can alleviate some of the burden on upper-level food waste handlers. In the food waste management stage, environmentally harmful methods such as landfill and incineration should be further reduced. Like the previous step, more incentives and stricter penalties should be implemented simultaneously to ensure that the reusable portion of food waste is reused before it enters landfills.

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