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Research article

Divert or donate? Early experiences with California's attempt to reduce organic waste and food insecurity

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ABSTRACT

Food waste poses significant environmental and societal challenges, with an estimated 30% of global food production lost or wasted along the supply chain, threatening both environmental sustainability and food security. The United Nations' Sustainable Development Goal 12.3 aims to halve global food waste by 2030, linking waste reduction to hunger alleviation. California sought to address both priorities simultaneously through Senate Bill (SB) 1383, a novel organic waste law. This article contributes to the literature on food loss and waste (FLW) mitigation by examining tensions between SB 1383's dual goals: diverting organic waste from landfills and redistributing surplus food to communities in need. While SB 1383 is a progressive policy, its implementation has revealed conflicts between these objectives. We assess the impact of SB 1383 on stakeholder compliance with its food waste reduction and recovery requirements. Specifically, we examine the two key objectives of this regulation: (1) mitigating climate change by diverting organic waste from landfills, and (2) addressing food insecurity by redistributing recovered food to communities in need. We interviewed 37 stakeholders, including food recovery organizations, jurisdiction representatives, and edible food generators involved in implementation. Additionally, we analyzed the distribution of Local Assistance Grant funds across California counties and between the policy's dual goals. Our findings indicate a stronger focus on waste diversion than food recovery, and an uneven distribution of funding, with rural areas facing greater challenges in adapting to SB 1383's requirements. We conclude by highlighting tensions in FLW policy design that seeks to advance multiple, sometimes competing, goals.

1. Introduction

Food loss and waste (FLW) – defined as food originally intended for human consumption but ultimately uneaten (Spang et al., 2019) – is a global issue with far-reaching environmental, economic, and social consequences. The UN Food and Agriculture Organization estimates that roughly 30% of globally produced food is lost or wasted along the supply chain (FAO, 2021). Reports highlight environmental harms associated with landfilled food, including greenhouse gas emissions and resource depletion (Dilkes-Hoffman et al., 2018; Lee et al., 2007; Melikoglu et al., 2013; Scherhaufer et al., 2018). In the U.S., about one-third of all food produced ends up in landfills — and the total quantity of food waste is increasing (EPA, 2025b). In California, organic waste makes up 48% of all waste, including 6 million tons of food discarded annually (CalRecycle, 2025b; CDFA, 2025), equivalent to 2.5 billion unspoiled meals.

Beyond its environmental impacts, FLW exacerbates food insecurity. Roughly 66 million tons of edible food are landfilled annually in the U.S., even as millions lack reliable access to food. In 2022, more than 10% of U.S. residents were food insecure (USDA Economic Research Service, 2025); in California, 11% (4.3 million people) were food insecure in 2018. This figure rose significantly during to the COVID-19 pandemic, reaching up to 23% in 2020 (Feeding America, 2020, 2021). Globally, researchers continue to document concerns about food security, particularly in terms of food access, affordability, and distribution (Cafiero et al., 2018; Paudel et al., 2023; Premanandh, 2011; Wheeler and Von Braun, 2013).

In 2015, the UN adopted Sustainable Development Goal 12.3 to halve global per capita retail and consumer food waste and reduce supply chain losses by 2030. The US adopted a parallel goal to cut food waste by 50% (EPA, 2025b). Meeting SDG 12.3 requires addressing FLW across the entire food supply chain, from production to consumption (Food and Agriculture Organization of the United Nations (FAO), 2013). While food waste hierarchies prioritize prevention and redistribution, comprehensive policy should engage stakeholders at

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Abbreviations

AB	Assembly Bill
AD	Anaerobic digestion
CalRecycle	California's Department of Resources Recycling and Recovery
EFG	Edible food generator
EPA	United States Environmental Protection Agency
FLW	Food loss and waste
FRO	Food recovery organization
SB 1383	Senate Bill 1383, California's Short-Lived Climate Pollutant Regulation
Tier 1 generators	Supermarkets, grocery stores, food service providers, food distributors, wholesale food vendors
Tier 2 generators	Restaurants, hotels, health facilities, large venues and events, state agency cafeterias
UN	The United Nations
USDA	United States Department of Agriculture

every level (Dora et al., 2021; Cox et al., 2010). In support, the Environmental Protection Agency (EPA) released the Wasted Food Scale, which prioritizes prevention as the most environmentally beneficial strategy (EPA, 2023b). Yet many jurisdictions default to recycling, due to simpler logistics and existing infrastructure (ReFED, 2025), even though food donation provides nearly double the greenhouse gas reduction of anaerobic digestion and ranks higher in the hierarchy (EPA, 2023b; Sundin et al., 2022). Donation, however, requires coordination and resources – cold storage, transportation, and labor – which many underfunded food recovery organizations (FRO) lack (Arroyo et al., 2024; Broad Leib et al., 2016; Chiarella et al., 2023)). This paper addresses a gap in FLW research by analyzing how policy efforts to achieve both landfill diversion and food redistribution can generate implementation tensions.

Motivated by concerns that jurisdictions may prioritize recycling over donation despite the latter's greater climate and equity benefits (EPA, 2023b; ReFED, 2025), we assess the implementation trade-offs and the support FROs need to meet regulatory goals, including infrastructure gaps in cold storage, transportation, and labor (Arroyo et al., 2024; Broad Leib et al., 2016). This study also builds on the work of Chiarella et al. (2023), which showed that food recovery organizations (FROs) – especially smaller ones – face disproportionate burdens under food waste regulations due to chronic understaffing and limited funding. Although equity has been explored in food distribution – such as Firouz et al.'s (2023) analysis of equity-efficiency trade-offs in food bank networks – there is limited research on how tensions between dual policy goals, like environmental protection and food access, may exacerbate implementation inequities.

California's Short-Lived Climate Pollutant Regulation law (SB 1383) sets ambitious dual goals: (1) diverting 75% of organic waste from landfills and (2) recovering 20% of edible food for redistribution by 2025 (CalRecycle, 2025a) (Fig. 1).

Other states have implemented FLW measures, such as Vermont's Universal Recycling Law or New York's mandatory recovery rules. But California's SB 1383 is the first to mandate statewide food recovery alongside organic waste diversion. Unlike state policies with narrower scopes, SB 1383 integrates environmental and societal goals into a single framework. Implementation, however, faces hurdles due to California's geographic scale, varied jurisdictional capacity, and infrastructure disparities.

Despite these challenges, SB 1383 builds upon earlier policies (e.g., AB 341 and AB 1826) and extends mandates to include both residential and business-level food recovery. The regulation encompasses a wide range of stakeholders – residential, commercial, and industrial – and features more detailed enforcement mechanisms.

This study investigates how California stakeholders are navigating SB1383's complex implementation. We examine the support needed by jurisdictions, FROs, and edible food generators (EFGs) to meet the law's dual goals. Using qualitative interviews and quantitative analysis of Local Assistance Grant distributions, we assess how stakeholders balance priorities between waste diversion and food recovery. Given California's leadership in FLW policy, our findings offer insights for other jurisdictions pursuing similar strategies.

Globally, policymakers face similar challenges in sustainable food waste management. In China, food waste's environmental burden is projected to increase 70%–148% under different scenarios (Ogunmoroti et al., 2022). FLW also jeopardizes food security due to its scale and systemic inefficiencies (Papargyropoulou et al., 2014; Wang et al., 2021). In the EU, targets under the Waste Framework Directive require reductions at all supply chain stages (European Commission, 2025), and countries like France and Italy have implemented national policies that strengthen food redistribution partnerships (De Laurentiis et al., 2023). While interest in food recovery is growing, research remains limited (Ogunmoroti et al., 2022; Wang et al., 2021).

2. Addressing two problems with one solution?

SB 1383 – an extension of California's landmark climate law AB 32 – seeks to tackle two distinct challenges: (1) mitigating climate change by diverting organic waste (including FLW) from landfills and (2) addressing food insecurity by redistributing surplus food. This research builds on Palimaru et al. (2022) and the Little Hoover Commission (LHC, 2023). Palimaru et al. assessed Los Angeles County's early preparedness – home to a quarter of the state's population – and identified key barriers such as limited infrastructure, short-term funding, staff shortages, and reliance on volunteers in food recovery. Our study expands their work by evaluating food recovery initiatives statewide and gathering FRO perspectives on barriers to meeting SB 1383's goals. LHC (2023) found stakeholders unprepared and recommended a temporary pause to allow for public education and improved coordination between state and local agencies. We further this analysis by investigating SB 1383's dual aims – waste reduction and food redistribution – and examining the LHC's claim that the policy design poorly fits rural areas.

While SB 1383 is largely an unfunded mandate, California's Department of Resources, Recycling and Recovery (CalRecycle) has been actively supporting implementation through its Local Assistance Grant Program, which funds food waste prevention and edible food rescue efforts (CalRecycle, 2025b). This competitive program targets jurisdictions — defined as cities, counties, or special districts responsible for waste collection (CalRecycle, 2025e).

All stakeholders require funding to scale efforts to meet SB 1383's goals. Jurisdictions need more composting and anaerobic digestion (AD) infrastructure. Although not top-priority solutions, composting and AD help return nutrients to soil and, in the case of AD, generate biogas. Although California has 20 AD facilities, a gap remains between existing infrastructure and what is needed to meet the mandate to reduce organic waste disposal by 75% by 2025 (Anaergia, 2022; CalRecycle, 2025c). SB 1383 provides guidelines for optimizing compost and AD benefits. Meanwhile, the food recovery sector also lacks capacity. EFGs like grocery retailers need funding to address space, labor, and training limitations, while FROs require investment in infrastructure (e.g., refrigerated trucks, technology for staff/volunteer coordination) to safely and consistently handle food donations.

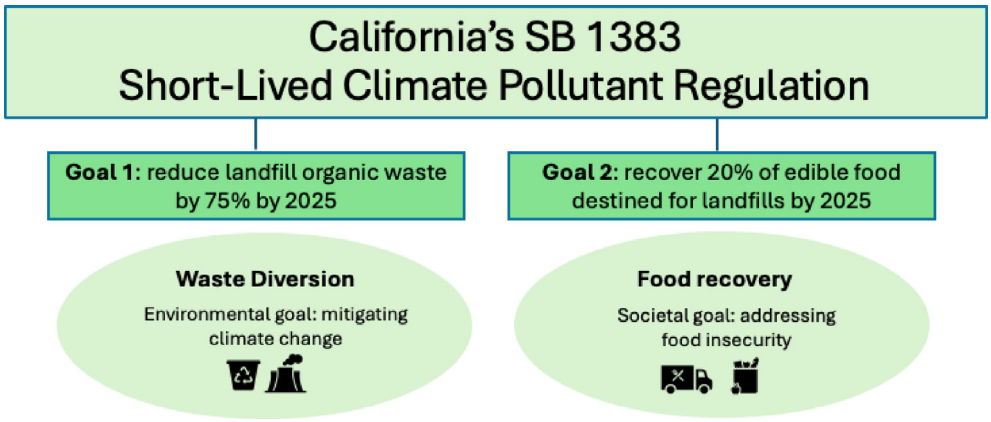

Fig. 1. Goals of California's SB 1383.

2.1. Scale of organic waste and FLW in California

Organic waste includes food waste, green waste, textiles, lumber, manure, biosolids, and more (CalRecycle, 2024), and contributes up to 20% of California's landfill methane emissions (CalRecycle, 2025f). Methane is 28 times more potent than carbon dioxide. Composting and AD are key strategies to reduce both organic waste and methane emissions. Composting involves accelerated aerobic decomposition (Martínez-Blanco et al., 2013), producing nutrient-rich soil amendments. AD converts organic materials – such as food scraps and manure – into biogas and digestate (EPA, 2023a).

According to CalRecycle's waste characterization data, California generated about 40 million tons of waste across all sectors in 2021, with organic waste comprising 34% of the total. Food waste made up 35.5% of residential organic waste[1] (6.96 million tons) and 34.1% of commercial organic waste (11,48 million tons). Of all waste, 5.2% was donatable food and 12.2% was non-donatable, inedible food (CalRecycle, 2024).

2.2. Food recovery systems in California

California's food recovery networks are comprised of large formal organizations (e.g., food banks) and smaller, informal ones (e.g., food pantries). Both types often rely on mixed funding and volunteer labor. They maintain protocols for safe food recovery (Chiarella et al., 2023; Lee et al., 2017; Second Harvest of the Greater Valley, 2022; Vitiello et al., 2015), yet differ in scope and scale (Chiarella et al., 2023). Food banks may purchase items like dairy and produce or pick up surplus food from farms and stores (Morello, 2021), while food pantries serve clients directly and often source food via food banks, local stores, farmers' markets, or gardens.

While FROs are not directly mandated by SB 1383, they are indirectly affected. The law requires EFGs to recover at least 20% of edible food currently disposed (CalRecycle, 2025a), increasing demand on FRO capacity. However, FROs receive no dedicated SB 1383 funding. As a result, donated food may still end up in landfills when organizations cannot redistribute it — either due to insufficient infrastructure or poor donation quality. Moreover, since SB 1383 does not track waste generated by FROs, the amount of donated food ultimately landfilled remains unknown — potentially undermining the law's methane reduction goals.

[1] Organic waste included the following categories: paper (uncoated corrugated cardboard, paper bags, newspaper, white ledger paper, etc.), other organics (food, leaves and grass, prunings and trimmings, branches and stumps, manure, textiles, carpets, remainder/composite organics, clean dimensional lumber, clean engineered wood, clean pallets and crates, and other wood waste), https://www2.calrecycle.ca.gov/WasteCharacterization/.

3. Methodology

This study examined whether a single regulation – SB 1383 – can simultaneously address the environmental challenge of organic waste and the societal challenge of food insecurity. We used a mixed-methods approach to capture both measurable impacts and the contextual complexity of implementation (Creswell and Clark, 2017). We conducted a quantitative analysis of Local Assistance Grant fund distribution across California counties and a qualitative analysis based on semi-structured interviews with 37 stakeholders. The quantitative analysis assessed how funding aligned with SB 1383's dual goals, while the qualitative interviews revealed how the policy is interpreted and enacted across diverse contexts (Saldaña, 2011).

3.1. Quantitative analysis

Between 2021 and 2024, CalRecycle distributed $166,123,567 through its Local Assistance Grant Program. We evaluated how Cycle 4 grants supported waste diversion and food recovery goals by analyzing the Project Summary descriptions (CalRecycle, 2022). Earlier cycles were excluded due to limited qualitative detail. If a project mentioned both goals, we allocated 50% of the funding to each. If only one goal was specified, 100% of the funding was assigned accordingly.

To examine how funding aligned with need, we used regression analysis to explore (1) the relationship between county-level per capita food insecurity and per capita grant funding for food recovery, and (2) the relationship between county-level per capita organic waste and per capita grant funding for organic waste diversion.

Food security data was analyzed using Rural-Urban Continuum Code (RUCC), which classifies counties based on population size and proximity to metro areas (USDA Economic Research Service, 2023). On average, rural/less urbanized counties (RUCC codes 7–9) had higher food insecurity rates (13.8%) than more urban areas (RUCC codes 1–6, 12.7%) (Feeding America, 2025b). Over half of California counties exceeded the statewide food insecurity average of 12.9%. The highest rates occurred in urban counties: Imperial (21%), Merced (16.6%), and Tulare (16.6%) – RUCC codes 3, 2, and 2, respectively.

3.2. Qualitative analysis

SB 1383 involves a wide range of stakeholders; in this study, we focus on three key groups: jurisdictional representatives, FROs, and EFGs. (Other stakeholders include waste haulers, residents, and waste management facilities, and others.) Jurisdictions are responsible for local implementation, and EFGs (e.g., retailers, wholesalers, restaurants) must comply with food recovery requirements. FROs (e.g., food banks and pantries) are not mandated to comply but must track food received (in pounds) if they choose to participate (CalRecycle, 2025d).

Table 1
Open-ended questions utilized in stakeholder interviews.

Background
Personal background: Would you mind stating your name and title and explaining a little bit about your role at this organization? Background on the organization: Can you broadly state the goals of your organization and your work within it? How would you qualify your work with respect to organic waste diversion and/or food recovery in the context of SB 1383?
General
How well do the aims of SB 1383 align with the mission of your organization? To what extent do you feel that your organization's perspective (or the perspective of those you represent) was taken into account in the design of SB1383? What aspects of SB 1383 have been most challenging for you? What resources have been most helpful in your response to SB 1383? What has been the biggest surprise that you have experienced in responding to SB 1383?
Funding for SB 1383
How has your organization/jurisdiction (or those you represent) funded any changes necessitated by SB 1383? How sustainable is that funding model? If you were allocated additional funding toward improving your response to SB 1383, how would you spend it? If those you represent were allocated additional funding, what areas might they spend it in?
Effects of SB 1383 on food recovery and food access
Do you think SB1383 is having a meaningful impact on food recovery/insecurity? How are the quantity and quality of donated food impacted by SB 1383? What would you change about SB 1383 to better address food recovery insecurity?
Effects of SB 1383 on other dimensions
How has SB 1383 impacted your relationships with other jurisdictions/ those you represent? Have you noticed any changes in collaboration/ communication since SB 1383 went into effect? How has the impact of SB1383 varied across your areas of 'operation'? Have you or those you represent benefited in any way from increased documentation? Do you or those you represent plan to expand your operations to include new donations from Tier 2 generators? If so, will this require any operational changes, additional preparation, etc.? What metrics are you using to track progress toward the goals of SB 1383?
Closing questions
Is there anything else that you would like to share that we did not touch on? Who else should we talk to get additional perspectives from your sector or other sectors?

We conducted 32 semi-structured interviews with 37 stakeholders from 17 California counties: 14 FROs, 13 jurisdiction representatives, 3 EFGs, and 2 consultants. Participants were selected through a combination of convenience and snowball sampling, with particular attention to including underrepresented and rural communities. Five pilot interviews were conducted to refine the questionnaire but were excluded from analysis. The study received approval from the Institutional Review Boards (IRBs) of [Institution Name 1] and [Institution Name 2] in the spring of 2023.

Interviews were conducted via Zoom between May and October 2023. Three [Institution Name 2] MBA students assisted with interviews, notes, and first-round reflections. The semi-structured questionnaire included background questions, perceptions of SB 1383, implementation challenges, funding models, food access outcomes, and organizational changes (see Table 1).

Interviews were transcribed using Zoom and manually cleaned. We used Dedoose (SocioCultural Research Consultants, (LLC, 2023)) for analysis. The lead researcher used an exploratory inductive coding approach, free of preconceived theories, to develop an initial set of themes (Azungah, 2018; Saldaña, 2021). The research team then collaboratively refined these into four key themes: SB 1383 policy awareness, implementation challenges, the role of scale, and evaluation of success. Interviews were coded accordingly, with illustrative quotes highlighted. These excerpts, along with corresponding codes, were exported from Dedoose to Excel for further analysis. Section 4.2 presents the resulting insights, supported by selected quotes (see Appendix).

The strength of qualitative methods lies in surfacing diverse stakeholder experiences and capturing participants' unique perspectives. Interview-based approaches are widely used in food waste research for this reason (Gillman et al., 2019; Papargyropoulou et al., 2014). However, like most qualitative studies, this method is not intended to produce generalizable findings. A key limitation of our study is the small number of EFG participants (n=3), likely due to regulatory uncertainty and business pressures, which may have constrained retailer input. While we included a diverse range of stakeholders – FROs, jurisdictions, and EFGs – from both urban and rural areas, the interviews are not fully representative of all actors involved in SB 1383 implementation.

4. Findings

Although SB 1383 helped making progress toward environmental and food recovery goals, the law's design and rapid implementation timeline have created some challenges for the interviewed stakeholders. The data analysis of the distribution of the Local Assistance Grant funds and the qualitative data from stakeholder interviews complemented each other and provided a more holistic understanding of these challenges. Findings are detailed below.

4.1. Quantitative findings

Examples of funded projects aimed at waste diversion included developing, implementing, and maintaining new organic recycling and procurement programs; staffing an enforcement officer for SB 1383 compliance; providing needed equipment and signs for residential and commercial parties; and hiring a contractor to label garbage and recycling containers with information on allowable materials. Per capita waste diversion grant dollars varied from $0 to $17 across jurisdictions.

Examples of funded projects targeting food recovery included planning and launching an edible food recovery program; educational videos on food recovery; planning the city's capacity for its edible food recovery program; expanding the capacity and collection of recoverable foods; assisting EFGs and cities with edible food recovery; and reporting and record-keeping efforts. Per capita food recovery grant dollars varied from $0 to $50.10.

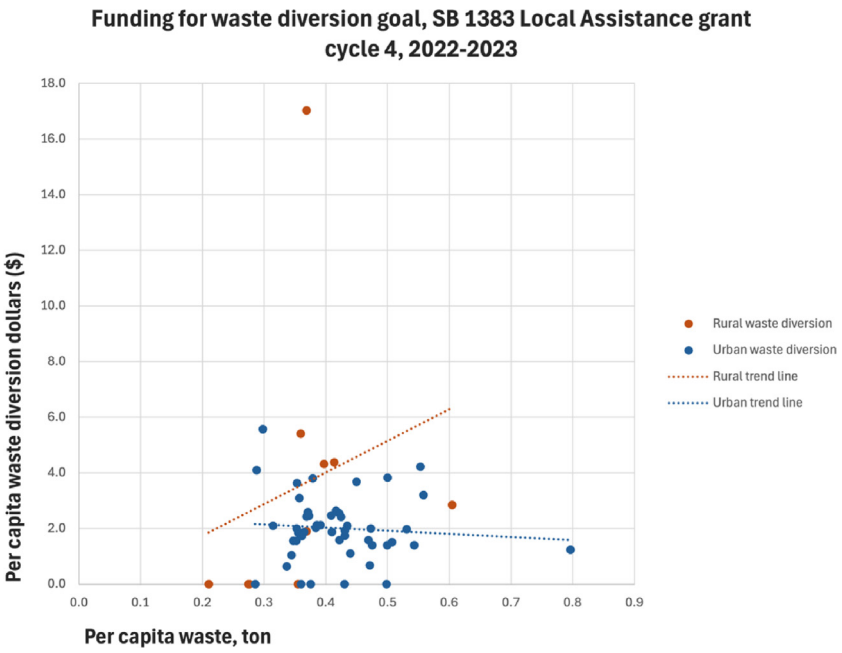

Fig. 2. Funding for the waste diversion goal of SB 1383, Cycle 4 Local Assistance Grant, 2022–2023. Source of data: CalRecycle.

Jurisdictions from all 58 California counties participated in Local Assistance Grant Cycle 4. Based on how we assigned funds to the two goals, approximately $72,654,544 (66.4%) was spent on waste diversion and $36,794,998 (33.6%) on food recovery, from a total of $109,449,542. Fig. 2 shows the allocation of funding toward waste diversion (blue dots represent more urbanized counties with RUCC codes 1–6, and orange dots rural counties with RUCC codes 7–9). In San Francisco County (far-right blue dot), per capita residential and commercial waste was 0.8 tons, and per capita waste diversion funding from Cycle 4 was $1.20. In contrast, in Siskiyou County (topmost orange dot), per capita residential and commercial waste was approximately 0.4 tons, and per capita waste diversion funding from Cycle 4 was $17. The regression lines indicate that per capita waste diversion funding was positively correlated with per capita waste for rural counties but negatively correlated with per capita waste in urban counties.

Fig. 3 illustrates the allocation of Cycle 4 funding toward food recovery. In Imperial County (far-right blue dot), 21% of the population was food-insecure, and per capita food recovery funding was $2. In contrast, in Amador County (topmost blue dot), 11.10% of the population was food-insecure, and per capita food recovery funding was $50.10. Rural and urban counties both exhibit negative relationships between rate of food insecurity and per capita food recovery funding, more strongly for rural counties.

We found a wider variance in the Cycle 4 funding distribution for food recovery than in waste diversion among jurisdictions. Although every county outlined waste diversion goals, approximately one-third did not pursue food recovery in their Cycle 4 application. Urban counties with higher per capita organic waste tended to receive less funding to meet their waste diversion goals. We found a stronger negative relationship between food insecurity and per capita food recovery funding, among urban and especially among rural counties. These figures are suggestive of challenges in allocating limited funding across a range of different jurisdictions and across the varied components of SB 1383, challenges which were echoed in our stakeholder interviews.

4.2. Qualitative findings

A qualitative analysis of the interviews highlighted the intricate landscape of SB 1383 and the challenges stakeholders have faced in its implementation. Although overall awareness of SB 1383 was high, there was confusion regarding how to implement it in each county. The need for counties to address this confusion and implement SB 1383 spurred collaborations and knowledge exchanges in urban areas, but some rural areas remained siloed and unprepared. Additional challenges included a lack of sustainable funding, disproportionate responsibility on the shoulders of all stakeholders, and a short timeline for behavior change (e.g., separating organic waste from regular mixed waste). Interviews showed that stakeholders' scale and affiliation with Feeding America contributed to SB 1383 compliance success, highlighting equity concerns. Moreover, SB 1383's new requirement to closely track food supplies caused some EFGs to procure less food, which may have contributed to decreased donations. The two overarching themes of our qualitative interviews were a disproportionate burden of SB 1383 on rural areas and its stronger focus on waste diversion strategies compared to food recovery strategies. We provide a detailed description of these findings below, with supporting quotes in Appendix. Table 2 summarizes these findings.

Theme 1: Policy Awareness of SB 1383

Interviews covered stakeholders' perspectives and visions for SB 1383. Stakeholders also shared how their understanding of SB 1383 helped them identify challenges in meeting its requirements. Awareness of SB 1383 was moderately high, with urban jurisdictions tending to exhibit greater awareness than their rural counterparts. However, confusion prevailed among most stakeholders on its details.

Awareness and Confusion: Although SB 1383 awareness was high, there seemed to be limited understanding about the specifics of the regulation as well as a lack of concerted action to implement measures aimed at achieving compliance. SB 1383 allows for flexibility in jurisdictions' approaches to implementing the regulation, which leads to a variety of interpretations. Counties lack streamlined rules and clear steps, leading to a general sense of confusion. While some areas tackled SB 1383 collaboratively by increasing communication and cooperation with other jurisdictions, others appeared siloed and disconnected from knowledge-sharing. Some rural stakeholders felt that the knowledge of urban stakeholders shared in workshops and learning groups did not apply to them.

Education to Eliminate Confusion Around SB 1383: Our interviews identified numerous educational efforts among stakeholders to

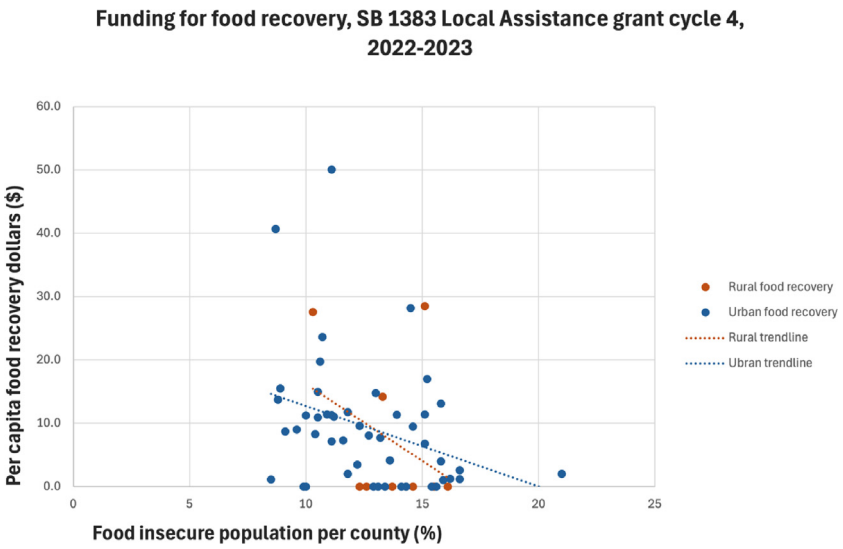

Fig. 3. Funding for the food recovery goal of SB 1383, Cycle 4 Local Assistance Grant, 2022–2023. Source of data: CalRecycle, Feeding America.

Table 2
Summary of themes from qualitative interviews.

Theme 1: Policy awareness of SB 1383	Theme 2: Challenges of SB 1383 Implementation	Theme 3: The Role of Scale and Networked Institutions	Theme 4: Evaluation of Success
• Evidence of both awareness and confusion • Education to eliminate confusion around SB 1383	• Funding and infrastructure challenges • Disproportionate responsibility for stakeholders • Behavior changes in a short timeline • Procurement challenges	• Influence of Feeding America Network • Increased competition • Increased collaboration	• EFGs optimized their food supply • Changes in the quantity and quality of donated food

Quotes from interviews that provide additional context for the themes are included in the Appendix.

increase awareness and eliminate confusion. These included CalRecycle workshops for jurisdictions and other stakeholders, communication between jurisdictions and jurisdictional departments, education among EFG stakeholders, initiatives by FROs to educate partners about food recovery, jurisdictional efforts to educate community members, and collaboration with waste partners to educate communities. The state appeared to respond promptly to stakeholders' inquiries about the details of the regulation. Partnerships also played an instrumental role in the success of education efforts. Frequently, urban areas were more active in forming partnerships and hubs of knowledge exchange, whereas rural areas lagged behind in forming partnerships and gaining access to education.

Theme 2: Challenges of SB 1383 Implementation

In response to SB 1383, complying stakeholders have rapidly adjusted their operations. Our interviews identified several challenges related to the initial regulation rollout, namely: a current lack of resources (such as inadequate funding, staffing, equipment, and transportation) to implement SB 1383 on a short timeline, disproportionate allocation of responsibility across stakeholders, difficulty navigating SB 1383 due to its complexity, and difficulty in adjusting consumer and business behavior to properly sort waste. By targeting both landfill waste diversion and food recovery, the design of SB 1383 appeared daunting. FROs reported feeling overstretched by the additional requirements of SB 1383 in the absence of additional funding. They emphasized that the Local Assistance Grant funds were distributed through jurisdictions, and that FROs were not provided with funding directly.

Funding and Infrastructure Challenges: Even with funds made available through CalRecycle's Local Assistance Grant program, some jurisdictions felt that they had neither sufficient funds nor the available infrastructure to swiftly implement the activities required. EFGs expressed concern at their lack of access to Local Assistance Grant funding while having to incur costs due to SB 1383 requirements. FRO interviewees also noted limited funding to support the operations necessary to comply as well as a lack of sustainable funding to support the increased food recovery efforts.

Disproportionate Responsibility for Stakeholders: All groups of interviewed stakeholders were concerned about bearing disproportionate responsibility for SB 1383 implementation and compliance, while receiving inadequate support. A rural jurisdiction noted that local solid waste and recycling entities shoulder substantial responsibility for implementing SB 1383 provisions, despite it being a state program. They emphasized that the program's success relies significantly on these local entities. Similarly, FROs highlighted the need for EFGs to assume greater responsibility, yet EFGs reported feeling overburdened by the requirements imposed by SB 1383.

Behavior Changes Within a Short Timeline: Another challenge involved the need for behavior change, namely separating organic waste from mixed landfill waste, on a short timeline. Although some participants expressed optimism concerning the stakeholders' capacity to adjust to the waste diversion requirements of SB 1383 (comparing it

to the California Integrated Waste Management Act, AB 939 of 1989), they deemed the timeline of SB 1383 very short. Behavior change, such as learning to sort food for donation instead of discarding it, proved challenging for EFG's staff. Jurisdictions and FROs identified similar sorting challenge among households and staff, respectively.

Procurement Challenges: The procurement element of SB 1383 has been challenging to understand and implement throughout California localities. Cities and counties must meet annual procurement targets for recovered organic waste products, which include compost, mulch, renewable energy from AD, and electricity from biomass conversion (CalRecycle, 2025g). Jurisdictions have struggled not only to find ways of procuring sufficiently vast amounts of mulch and other materials, but also to find consumers for them. Because procurement targets were based on population size, areas with large populations struggled to meet high procurement goals.

Theme 3: The Role of Scale and Networked Institutions

Our interviews showed that the scale of stakeholders and their level of networking with other institutions contributed to the stakeholders' success in complying with SB 1383. Joining the Feeding America Network, the largest national food charity organization representing a network of food banks, provided access to additional resources and support. Conversely, the generally smaller FROs that were not Feeding America Members felt left behind. Further, interviewees commented on instances where the legislation led to increased competition between FROs as well as increased collaboration.

Feeding America Network: Our interviews revealed concerns about the inequitable distribution of food, funding, and benefits among organizations within the Feeding America network compared to those outside of the network. Smaller "mom and pop" grocery stores found themselves unsupported and unable to benefit from the scale and network of Feeding America. Further, donating EFGs trusted FROs in the network more than those outside of the network, while some FROs outside of the network lost access to previously established contracts with donors following SB 1383. Finally, the non-distribution section of the Feeding America agreement (Feeding America, 2025a), which prohibits member agencies from redistributing food to organizations outside the Feeding America network, sometimes left food recovery organizations (FROs) with surplus food they cannot further redistribute.

Competition: Several stakeholders expressed that SB 1383 had created an environment of competition among FROs for contracts with EFGs and among jurisdictions for Local Assistance Grant funding. Additionally, some participants noted that due to SB 1383's dual goals, food recovery may be competing with organic waste diversion because food recovery incurs costs, whereas organic waste can generate profit.

Collaboration: Despite existing competition, SB 1383 encouraged stakeholders to forge new relationships. As a result, new collaborations emerged among jurisdictional departments, jurisdictions from different regions, FROs, and EFGs, as well as among different types of stakeholders. Some stakeholders shared that, in the past decades, they had never experienced this level of sharing and collaboration. Participants stated that SB 1383 had promoted partnerships with colleagues in other jurisdictions. Collaboration between jurisdictions and franchise haulers had proven beneficial in addressing SB 1383 compliance issues.

Although SB 1383 has sparked unprecedented collaborations among many stakeholders statewide, some rural areas felt isolated and did not appear to benefit from the same level of collaboration as their urban counterparts. One rural jurisdiction expressed discouragement at repeatedly hearing examples of what was working well for urban jurisdictions, as these urban examples did not apply to their very different rural context and infrastructure.

Theme 4: Evaluation of Success

We asked participants about the impact of SB 1383 on the quantity and quality of food donations. Participants provided mixed responses regarding quantity, citing various contributing factors such as inflation rates, supply chain issues, changes in procurement practices among EFGs, and staffing changes among FROs following the COVID-19 pandemic. Additionally, interviews highlighted overall improvements in the quality of donations, with some exceptions of donation dumping.[2]

EFGs Optimized Their Food Supply: Several stakeholders reported reduced quantities of donations due to changes in EFGs' practices, as some procured less food overall, resulting in smaller donation amounts. Some participants stated that smaller donation quantities may impact the ability of FROs to meet the needs of food-insecure populations.

Changes in the Quantity and Quality of Donated Food: Some stakeholders described decreases in both the quantity and quality of food donations following SB 1383. One factor contributing to the decrease in donations was that the food was rerouted through larger FROs instead of going directly to smaller ones. In contrast, some participants indicated that the quantity of donations increased because of SB 1383, as more excess food was donated to FROs due to the increased requirements and the addition of new food donors to the program. Additionally, SB 1383 may have resulted in a sustained flow of donations despite the decreased supply of food to FROs from the USDA.[3]

Stakeholder responses regarding the quality of donations were mixed. Some stated that the quality had improved since SB 1383 required EFGs to donate additional categories of food, whereas others noted that the quality had not changed, or that it had decreased. Participants linked the possible decline in the quality to the increased volumes of donations while the FROs' processing capacity remained the same. Some participants also mentioned increased instances of donation dumping, although there was not enough evidence to suggest that SB 1383 directly influenced this trend.

5. Discussion

This study is the first to investigate the statewide implementation of California's environmental policy SB 1383 aiming to address dual goals: diverting organic waste from landfills and recovering food previously destined to landfills for communities in need. Our stakeholder interviews and quantitative analysis of the Cycle 4 Local Assistance Grant funding data indicated that rural and less urbanized areas may experience more challenges implementing SB 1383 than more urbanized areas. We also discovered a potentially greater focus on waste diversion strategies compared to food recovery strategies across jurisdictions. This reflects a broader concern in the literature: both donation and recycling are reactive strategies that manage surplus after it is created, potentially reinforcing overproduction rather than preventing it (Messner et al., 2020; Mourad, 2016; Oroski, 2025). Decisions about surplus food are often shaped more by logistical and economic constraints than by quality or need. As actors pursue divergent goals – prevention, recovery, or recycling – policies like SB 1383 may unintentionally set donation and diversion in competition. Achieving lasting progress requires systemic change: reducing surplus at its source through shifts in economic incentives, supply chain practices, and stronger emphasis on sustainability in food production and measurement.

The ambitious goals of SB 1383 have encouraged promising new collaborations (mostly in urban areas) within and among jurisdictions, among all involved stakeholders, and within the stakeholder groups.

[2] Donation dumping means knowingly providing unusable or inedible food forcing food recovery after capacity has been reached, or intentionally delivering food outside of the agreed upon food recovery windows (Kennedy Faires, 2025); https://kennedyfaires.com/wp-content/uploads/2024/04/s24-Food-Donation-Info-Packet.pdf.

[3] FROs (food banks) receive food donations from various sources, including EFGs (retailers), the USDA, and other sources; https://www.cdss.ca.gov/inforesources/fdu#:~:text=The%20Emergency%20Food%20Assistance%20Program,and%20households%20within%2058%20counties.

The interview findings highlighted the lack of resources for all stakeholders to meet the requirements of SB 1383. The primary challenges included a lack of sustainable funding, inadequate infrastructure for food recovery, a lack of infrastructure to quickly and equitably move food from FROs/EFGs to communities in need, and confusion around the procurement of the organic waste diversion requirement of SB 1383.

Stakeholders in rural counties expressed concerns that the regulation was not designed "with rural counties in mind". Food recovery networks in rural areas differ drastically from those in urban areas, with limited infrastructure, fewer staff, less funding, and longer distances between sources of food and communities in need. Urban areas also experienced challenges in equal food distribution due to logistical and technological limitations, with food being redistributed to FROs closest to food generators rather than communities most in need. Our interviewees pointed to the importance of improved technology such as apps to efficiently track and distribute food from donors to recipients. Further research is needed to explore the potential disparity between available food and communities in need and the infrastructure and logistics solutions to move food quickly to avoid downstream food waste.

Other difficulties included disproportionate levels of responsibility on some stakeholders as well as the design of SB 1383 being challenging due to the flexibility given to local jurisdictions to implement the complex regulation. Additionally, behavior change, such as adjusting to the new recycling bin colors, was identified as a challenge by jurisdictions and FROs.

Our data analysis of the distribution of funds identified less investment in food recovery efforts compared to funding for waste diversion goals. Notably, the analysis also suggested that counties with higher food insecurity received less funding aimed at food recovery. This emphasis on waste diversion relative to food recovery aligns with similar findings from a nationwide assessment of state food waste policies, which also found that none of the states would achieve the federal goal of reducing per capita food waste by 50% by 2030 based on their existing policies (Kakadellis et al., 2025).

Overall, stakeholders valued SB 1383 and its significance for greenhouse gas mitigation, but many struggled to meet its ambitious goals. Meanwhile, the challenge of solving two different problems – organic waste diversion and food recovery – with one regulation contributed to the dispersion of stakeholders' attention rather than focusing it on one problem at a time. Despite access to educational resources and strong support networks (in urban areas), some counties did not consider the regulation applicable to them. However, SB 1383 sparked dialogue and pushed stakeholders to coordinate with one another and intra-regionally. Some stakeholders indicated that the regulation ignited an unprecedented level of coordination between jurisdictions, FROs, and EFGs.

To achieve optimal results in organic waste diversion and food recovery under SB 1383, we must consider the distinct differences between urban and rural stakeholders and to tailor training and education to the specific jurisdictional context. Clearer communication from policymakers regarding regulatory priorities will enhance implementation efforts. Additionally, fostering stronger collaboration between science and policy is essential, as these fields often operate independently. Caro (2023) highlights the growing need for such collaboration, emphasizing that food systems are highly complex and multidimensional, with significant environmental and health impacts. As global food systems continue to strain planetary resources due to population growth and inefficient practices, a reinforced science-policy interface is essential for developing effective, evidence-based policies. Adjusting the regulation's funding mechanisms can further prevent competition among stakeholders for limited resources. Finally, investing in technology and infrastructure is essential for ensuring efficiency and equity in food recovery efforts, while guiding policy decisions with accurate, comprehensive data.

While this research centers on California, its insights extend beyond the state. As more governments adopt dual-goal FLW policies – linking waste reduction with food redistribution – understanding how implementation unfolds in complex, uneven policy environments becomes increasingly important. This study contributes not only empirical findings but also theoretical insights into how regulatory design, stakeholder capacity, and equity considerations shape the outcomes of complex sustainability mandates.

6. Conclusions

We assessed the implementation of SB 1383's dual goals: (1) diverting organic waste from landfills to mitigate climate change and (2) recovering food destined for landfills to feed communities in need. While both goals serve critical societal and environmental functions, they must be pursued alongside prevention strategies – such as producing, buying, and serving only what is needed – as prevention remains the most environmentally preferred solution (EPA, 2023b).

Equity metrics should guide funding allocations to ensure resources are distributed fairly across stakeholders and policy objectives. Policymakers and implementers must avoid prioritizing one goal at the expense of the other. An equity-focused lens is essential to address structural challenges faced by stakeholders in rural and low-income urban areas with limited infrastructure. Effectively addressing food insecurity requires accounting for the unique contexts of vulnerable populations (Hamilton et al., 2024).

Our findings highlight tensions within SB 1383 between FLW prevention and food recovery. Although the regulation offers a novel approach to addressing intersecting environmental and societal issues, clear guidance is needed on implementation priorities. Policymakers must improve communication and support more inclusive policy design and implementation processes.

While SB 1383 has brought critical attention to food insecurity, it is not sufficient on its own. A more comprehensive set of measures is needed to tackle the problem at the structural level. Our mixed-method analysis revealed a stronger emphasis on waste diversion strategies relative to food recovery, despite EPA guidelines placing food recovery directly below prevention and above composting and anaerobic digestion. Economic incentives may explain this divergence: food recovery often entails additional costs for infrastructure, technology, and coordination, while diversion can generate additional revenue for waste haulers and treatment facilities. Systemic change is needed to realign policy, infrastructure, and incentives toward prevention and recovery.

Future research should continue to examine the design and implementation of FLW policies that target multiple goals. Although SB 1383 is still in its implementation stage, stakeholders' experiences offer valuable lessons for California and jurisdictions pursuing similar regulations. This paper can also inform international policy efforts in regions aiming to reduce food loss and waste. As policymakers expand these initiatives, they must balance environmental and societal priorities to transform the landscape of food waste and food security.

CRediT authorship contribution statement

Yulia Lamoureaux: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Charles J. Corbett:** Writing – review & editing, Validation, Resources, Conceptualization. **Scott Rodilitz:** Writing – review & editing, Validation, Resources, Conceptualization. **Edward S. Spang:** Writing – review & editing, Validation, Supervision, Resources, Methodology, Investigation, Funding acquisition, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix. Quotes supporting qualitative section (4.2)

Theme 1: Policy Awareness

Code: Awareness and confusion

Quotes:

"There's a lot of uncertainty that has come from that flexibility [with SB 1383 implementation] that we weren't necessarily warned about from CalRecycle." (Jurisdiction)

"I think this bill would flow much better if everyone had the same standards and requirements [to avoid confusion]." (FRO)

Code: Education to eliminate confusion

Quote:

"Our goals are to move safe and healthy food to our neighbors. There's a lot of excess products out there, there's a lot of businesses out there that don't realize what we can take and use and share with our neighbors. So, we're educating and providing a resource to move that product." (FRO)

Theme 2: Challenges of SB 1383 implementation

Code: Funding and infrastructure challenges

Quotes:

"A lot of our [rural] counties are really under-resourced. So, when the State passed this regulation, there wasn't any funding to go with it. We've had to fight every year to get money into the State budget to go down to local assistance to implement this program effectively." (Jurisdiction)

"It's hard coming up with the law and not providing the money for the jurisdictions to implement it. It has been challenging, so we've had to get very creative here at times." (Jurisdiction)

"So, we are currently mostly utilizing existing funding sources within the city. (...) It is not sustainable to continue relying on just the existing funding available." (Jurisdiction

"As a person that is responsible for keeping this food, there's costs involved. But nobody really talked about the cost for the generators [EFGs]. So, us generators are literally paying to get this food out to the [food] insecure people." (EFG)

"There is no funding associated for us, at least. So that has probably been our biggest hurdle and frustration, is this [SB 1383 implementation] is being put on staff, who already have many other duties." (FRO)

"Unless [the funding] was ongoing, then it was doomed to fail. (...) You need someone on staff to be just monitoring [implementation] consistently. I would say it is not sustainable in the current way it's thought of." (FRO)

Code: Procurement challenges

Quotes:

"Meeting the procurement goal is something that seems easy because you're just buying [organic material] and giving it away. [There is a need to] have a medium and having an event to give it away and doing that aspect of it has been the biggest surprise on our end of how difficult it is." (Jurisdiction)

"The [procurement] methodology is based on population. I think that makes it really hard for jurisdictions like ours that have such a large population because that makes our procurement target really high, but then, not as many spaces to necessarily use that material." (Jurisdiction)

Code: Disproportionate responsibility

Quotes:

"Local solid waste and recycling jurisdictions are the hub of SB 1383. They are responsible for making sure that all the provisions get carried out. It's not the State, even though this is a state program. So, we have a lot of responsibility on the shoulders of the locals to try to make sure that this [SB 1383 implementation] is successful." (Jurisdiction)

"The biggest challenges that I have [is] in terms of getting people to separate their food scraps from the garbage and getting people to keep the actual garbage out of the compost bin." (Jurisdiction)

"I feel like there needed to be and could still be a stronger responsibility placed on the Tier 1 and Tier 2 generators. All the ownership is on the government agencies right now, and we are owning the work, we are owning the cost of everything." (FRO)

"One of the biggest challenges is changing the mindset of people who've already been doing something for a long time (...). You have to let your staff know they cannot continue to do what they've been doing and throw out edible food." (FRO)

"So, we're happy to foot the bills to make sure that internally we're operating a program. But we're not in the business of food pickup and food distribution. So, if they're [policymakers] going to put that on the shoulders of us, to venture into a whole different business, which I don't think any grocer could possibly afford to do." (EFG)

Theme 3. Role of scale

Code: Stakeholder scale

Quotes:

"[Tier 2 EFGs] are running on a shoestring already, and to ask them to incur any kind of costs [is a challenge]. Grocery stores, medium and large size, our volume is pretty decent, so, the work that we put into this food recovery process is well worth it. And when you have a small restaurant, they're not going to have the high volume, but they're going to have the expense of putting together a program for not much output and having no resources to pick up their food and keep it safe." (EFG)

"In our case, it wasn't a big deal because we already had the program going. And we already had a solid relationship with Feeding America. But I do know a couple of small grocers in our county that have no idea what to do [for compliance with SB 1383]." (EFG)

"Right now, different food recovery organizations are just sending emails [with] requests for food. There is an unequal distribution [of food]: some of [the pantries] get a lot and it's just because they're right next to the grocery store. So, it's not necessarily about the demand they have, it's just the easiest for that store to get rid of the food there and the pantry is willing to take it." (FRO)

Code: Competition

Quotes:

"What really surprised me was, they're [food pantries] almost in competition with each other. And so, we had to hire a consultant to help us navigate because we have one large food bank and all these supporting pantries. And what I hear is this is a problem across the State. So, the issue still exists today." (Jurisdiction)

Competition between food recovery and waste diversion

"Keep it safe, for humans, keep it refrigerated and [put the] date on, and everything. It's just more work. It's more labor. So yes, [food recovery] costs money, and [organic compost] pays you." (Jurisdiction)

Code: Collaboration

Quotes:

"I've been in solid waste for over 25 years, and I have never participated in this level of sharing and collaboration. It's been the best." (Jurisdiction)

"[SB 1383] opens up the dialogue and allows me to meet other people in different jurisdictions near me that are doing similar work. (...) So, it's just super beneficial in so many ways, working with the other cities." (Jurisdiction)

"Working really closely with our franchise hauler has been super beneficial to tackle some of these SB 1383 compliance issues." (Jurisdiction)

Collaboration between jurisdictions and FROs:

"It's certainly forced our hand to be more collaborative with other stakeholders, such as food banks. We've also developed relationships with other neighboring areas to share what's working, what's not working (...). We have collaborative calls with them now monthly, [we] share stories of success and stories that don't work. And we're all kind of learning together as we move forward with this program." (Jurisdiction)

Collaboration among EFGs:

"[SB 1383] creates a relationship between EFGs because we are following the protocol. And if there's issues or questions, we can reach out to each other. (...) We all work well in tandem together. It's a better learning experience." (EFG)

"And even with our competitors [other EFGs], I think we all talk about how we're handling it." (EFG)

Theme 4: Evaluation of success

Code: Changes in quantity and quality of donated food

Quotes:

Decreased quantity of donations:

"And we have seen that with going through COVID. And now, after COVID, grocery stores are changing how much they order and how much they have left over. It's very different. They're donating less food, not because they're throwing [food] away. It's because they have less food to donate. Things are expensive; they're being more careful with their purchasing. And so, the result is that there's not as much to donate." (Jurisdiction)

"[EFGs] are optimizing. Their businesses are finding ways to optimize their food that they need to donate. And ultimately it may be kept out of the landfill longer, which is great. But it may not be helping the food insecurity." (Consulting)

"We want to get as much food [as possible], but we've seen the decline in what they're [EFGs] donating since SB 1383. For instance, [name of large grocery chain], said, "We just don't order the products that aren't selling anymore. In the past, we used to have a variety of products and if we didn't sell it, we would donate it to you. But now we don't carry those products anymore. We've slimmed down our list of what we offer and what's available to our customers." (FRO)

"The quantity and quality [of donated food] have gone down. (...) There's an increasing need and a decrease in food. (...) But it's not just because of SB 1383. There are other factors that are impacting the quantity, such as food having to be routed through the food banks rather than directly to these [small grassroots] organizations." (Community-based organization)

Increased quantity of donations:

"I think in our 6 months we had an additional 5 million pounds that was attributable to the program. So, we have the measures to show the direct impact of this program in terms of the generators generating more [food] and the new generators getting into the system. So, [this is] definitely a positive impact [of SB 1383]." (Jurisdiction)

"I think it is having an impact. We're seeing just more food at a time when we're seeing less food from USDA, so it's been useful in that regard." (FRO)

"And now that we're getting more items from stores, the volume is up but the quality is down (...) and we're not able to utilize it. Now, it's putting us in a situation where I've got to come up with composting or disposal strategies." (FRO)

Instances of donation dumping:

"We get that more in our warehouse than our partner agencies do through the SB 1383 compliance stuff. A lot of people think they can give us their junk when really, we still need healthy food to get out to people and food that's safe to consume. So, I think we experience it [donation dumping] more." (FRO)

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