Economic Instruments for Methane Reduction & Improved Food Security in Ecuador

The Global Food Banking Network®

FLPC FOOD LAW and POLICY CLINIC HARVARD LAW SCHOOL

Global Methane Hub

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About The Global FoodBanking Network

Food banking offers a solution to both chronic hunger and the climate crisis. GFN works with partners in over 50 countries to recover and redirect food to those who need it. In 2023, our Network provided food to more than 40 million people, reducing food waste and creating healthy, resilient communities. We help the food system function as it should: *nourishing people and the planet together*. Learn more at foodbanking.org.

About the Harvard Law School Food Law and Policy Clinic

Since 2010, the Harvard Law School Food Law and Policy Clinic (FLPC) has served partner organizations and communities in the U.S. and around the world by providing guidance on cutting-edge food system issues, while engaging law students in the practice of food law and policy. FLPC is committed to advancing a cross-sector, multi-disciplinary and inclusive approach to its work, building partnerships with academic institutions, government agencies, non-profit organizations, private sector actors, and civil society with expertise in public health, the environment, and the economy. FLPC's work focuses on increasing access to nutritious foods, addressing the climate-related impacts of food and agricultural systems, reducing waste of healthy, wholesome food, and promoting food system justice. For more information, visit chlpi.org/food-law-and-policy.

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TABLE OF CONTENTS

INTRODUCTION

Communities and governments across the globe are currently engaging in conversations about ways to mitigate the impacts of climate change and increase resilience in the face of its effects. Strategies have emerged that utilize diverse practices, from endeavors such as planting trees and vegetation for carbon sequestration to technological innovations like carbon capture and storage. Similarly, resilience strategies also include a range of approaches from ideas like creating sustainable infrastructure for climate adaptation to full-scale efforts to move whole communities from places that are no longer habitable because of climate impacts. Food lies at the nexus of climate change mitigation and resilience, and climate strategies must include the food system to be effective. For example, ensuring that safe, nutritious food is consumed by humans keeps it out of landfills, where it decomposes and contributes to emissions of greenhouse gases — specifically methane. Additionally, when people have enough food to eat, they do not have to worry about meeting a basic need, and their communities become stronger and more resilient.

To explore the role of food recovery in mitigating climate change and increasing community resilience, The Global FoodBanking Network (GFN) and the Harvard Law School Food Law and Policy Clinic (FLPC), with funding from the Global Methane Hub (GMH), examined a set of key laws and policies in Ecuador that could support food recovery. While a broad constellation of policies can impact

food donation and recovery, the research for this report focused on a selection of policies that use economic instruments — specifically incentives or penalties — such as carbon taxes; carbon markets or greenhouse gas offset mechanisms; financial penalties, such as food waste deterrence policies like organic waste bans or food donation requirements; and other incentives like tax benefits to enhance food recovery. This report provides individuals, policymakers, and organizations interested in mitigating greenhouse gas emissions through food recovery with information about the relevant policies in Ecuador that might help further their goals, as well as opportunities for further progress.

To help confront the most urgent and widespread legal and policy questions surrounding food recovery and donation, FLPC and GFN partnered to create The Global Food Donation Policy Atlas (Atlas Project).[1] The Atlas Project aims to identify and explain national laws relating to food donation, analyze the most common legal barriers to promoting increased food donation, and share best practices for overcoming these barriers. The Atlas Project is mapping the laws and policies affecting food donations in countries around the world and in 2022 it issued a legal guide detailing Ecuador's relevant food donation laws and policies.[2] While the Atlas Project's Ecuador Legal Guide covers an array of laws impacting food donation in Ecuador, from food safety to liability protections for food donations, this report focuses only on policies that use economic instruments to either deter food waste — such as food waste deterrence laws — or to incentivize food recovery or donation — such as tax incentives or carbon offsets.

The remainder of this paper describes Ecuador's approach to relevant greenhouse gas emissions reduction policies and discusses the potential role for food donations to help reduce methane emissions. It begins with a summary of the action opportunities presented throughout the paper, followed by background on methane emissions, food loss and waste, and food recovery. The remaining sections evaluate Ecuador's relevant policy landscape and explore the potential for economic policy opportunities to support food donation and food waste reduction, including Ecuador's Zero Carbon Program (*Programa Ecuador Carbono Cero*, or PECC), carbon markets, carbon taxes, food waste deterrence laws, and tax incentives. Each section ends with examples of action opportunities that policymakers can take to support food waste reduction and thus reduce emissions. Because the action opportunities for the PECC and carbon markets align, they are presented together in both the action opportunities summary and following the carbon market discussion.

The research and recommendations below were reviewed by Banco de Alimentos Quito but have not otherwise been fully vetted with other in-country stakeholders. They were also reviewed by the *Quantifying and Growing Methane Reductions through Community-based Food Recovery and Redistribution* advisory group. The findings, conclusions, and recommendations presented in this report are those of GFN & FLPC alone.

ACTION OPPORTUNITIES IN BRIEF

The action opportunities presented in this paper and summarized in brief below provide a starting point for policymakers to build on and strengthen Ecuador's existing methane emissions policies by incorporating an increased focus on facilitating food donation. Policies that support food recovery and redistribution work not only to address social concerns such as poverty and high rates of

food insecurity, but also to mitigate methane emissions by reducing the amount of organic waste decomposing in landfills. Across all opportunities, it is essential to include food banks in the policy conversation from the start to ensure effective policy implementation and increase food donations, thereby maximizing methane emissions reductions.

In addition to the action opportunities identified herein, policymakers should consider additional opportunities to advance food donation and reduce methane emissions from food waste. They should partner with and include voices from food banks and other organizations with the mission to reduce food loss and waste and increase food donation (collectively referred to as "food recovery organizations"), as well as food donors.

The paper suggests action opportunities in the following areas:

CARBON ACCOUNTING INSTRUMENTS IN ECUADOR'S CLIMATE POLICY FRAMEWORK

Zero Carbon Program (*Programa Ecuador Carbono Cero*, or PECC) & Potential Carbon Markets

*When the Ministry of Environment, Water, and Ecological Transition (*Ministra del Ambiente, Agua y Transición Ecológica, or MAATE*) provides technical guidance to implement the Zero Carbon Program for waste management activities, it should:*

- *Use language that ensures food recovery organizations, such as food banks, can participate with projects that prevent food from entering the landfill and emitting methane.*

  Technical guidance for waste management projects should be written in a way that focuses on the core requirements for documenting emissions reductions and that avoids limiting projects that may accomplish those reductions. A broader approach to the guidance that focuses on ensuring the integrity of the underlying project rather than specific types of eligible projects, would allow food banks — which may not typically be associated with waste management activities — to benefit from the program financially while providing an opportunity for other entities to offset their own emissions.

- *Provide guidance on how food recovery projects can meet the additionality element required by the PECC, considering the organic waste ban currently being implemented under Ecuador's Food Loss and Waste Law (*Ley para Prevenir y Reducir la Pérdida y el Desperdicio de Alimentos y Mitigar el Hambre de las Personas en Situación de Vulnerabilidad Alimentaria *or Food Loss and Waste Law).*

  Both carbon markets and the PECC's carbon neutrality component require additionality. Project activity must result in additional emissions reductions compared to what would be possible under business as usual, absent the additional funding that would come from the Emissions Compensation Unit (*Unidades de compensación de emisiones* or UCEs) or offsets.

  Guidance on how to demonstrate additionality in food recovery projects — when the business-as-usual scenario under the Food Loss and Waste Law effectively requires emissions reductions by banning food disposal in landfills but does not mandate food donation as the only alternative use — would help food recovery organizations determine

the extent to which they can participate in the PECC or another offset framework like a carbon market. Such guidance could also help to ensure support for donation, which provides more benefits compared to some of the other alternative uses for food, such as composting and alternative energy generation.

To reduce methane emissions and promote food recovery projects in the PECC and any potential carbon market, policymakers should:

- *Provide assistance to food recovery organizations interested in participating in emissions offset programs like the PECC.*

  Considering the high costs around project development, monitoring, and third-party verification, policymakers could also provide grants or other financial assistance to food banks and other food recovery organizations interested in participating in emissions offset programs.

- *Ensure robust data collection.*

  Collecting baseline data on food loss and waste and food donations can help determine the potential effectiveness of food recovery projects in the PECC's carbon neutrality component and the impacts of any food loss and waste regulations. The data can then be used for a variety of other measures, including calculating the potential greenhouse gas emissions avoided by instituting a food donation requirement or a potential future compliance carbon market. Policymakers should authorize grants to support robust data collection related to food loss and waste and resultant emissions.

Carbon Tax

If the National Assembly were to pursue a carbon tax, policymakers should:

- *Include support for food waste reduction activities in the legislation.*

  If the National Assembly were to pursue a carbon tax, the tax law could create a fund for a portion of the carbon tax revenues to provide grants to food waste reduction projects, such as food donation or recovery infrastructure projects.

Methane Legislation

To strengthen commitments to methane reduction, policymakers should:

- *Codify the commitments in the Global Methane Pledge and use food donations to help meet methane emission reduction targets.*

  Ecuador can establish methane regulations and codify its voluntary commitment to reducing methane emissions. Further, including landfills in methane regulations could work in tandem with the Food Loss and Waste Law.

FOOD WASTE DETERRENCE & OTHER POLICIES TO PROMOTE FOOD DONATION

Ecuador's Food Loss and Waste Law (*Ley para Prevenir y Reducir la Pérdida y el Desperdicio de Alimentos y Mitigar el Hambre de las Personas en Situación de Vulnerabilidad Alimentaria*)

To promote food recovery activities and deter food waste from emitting methane in landfills, policymakers in Ecuador should:

- *Draft regulations to implement the Food Loss and Waste Law.*

  Shortly after taking office, President Daniel Noboa took steps toward implementing the law by publishing a framework with a new timeline for relevant agencies to publish their own regulations required to implement the law. Maintaining this timeline will ensure the Food Loss and Waste Law proceeds at the correct pace and the resultant food waste mitigation activities can improve methane emissions.

Tax Benefits for Food Donation and Recovery

To encourage more methane-mitigating food donations, policymakers could:

- *Offer tax incentives for food donations made to food recovery organizations and other intermediaries.*

  Tax incentives for food donations encourage people to donate more food and help to offset the costs of handling and transporting food for donation. While the Food Loss and Waste Law prohibits destroying food that is safe for human consumption, a tax incentive would encourage potential donors to choose donation over other allowable alternatives.

- *Provide a tax incentive for activities associated with the collection, storage, transportation, and delivery of donated food.*

  A tax incentive for activities associated with the collection, storage, transportation, and delivery of donated food should be considered to help offset the costs of donation and encourage actors in the food supply chain to invest in infrastructure that will facilitate food recovery activities.

Enhancing Food Recovery from Agricultural Producers

To help offset some of the costs, agricultural producers encounter when harvesting and transporting donated food, policymakers should:

- *Provide grants or tax incentives to encourage development of robust food recovery systems that will ease implementation of the Food Loss and Waste Law.*

  Grants and tax incentives should be available for producers to offset the costs associated with harvesting and donating food when prices are too low to be commercially viable. Funds and tax incentives should also be made available for infrastructure like cold storage and transportation that would allow farmers to properly store and transport their produce to food recovery organizations.

METHODOLOGY

To obtain the necessary data for this paper, the Harvard Law School Food Law and Policy Clinic

- Reviewed relevant existing FLPC materials, such as the Global Food Donation Policy Atlas Project Ecuador Legal Guide and Policy Recommendations.
- Conducted a high-level literature review to identify and understand the scope of emissions in Ecuador, Ecuador's approach to greenhouse gas emissions reduction policy, and the potential role of food banks in using food donations to help reduce methane emissions.
- Scanned the following databases to learn more about Ecuador's relevant law and policies, such as greenhouse emissions reductions policies and economic instruments: CarbonPulse, Elsevier, Science Direct, Westlaw Edge, LexisNexis, HeinOnline, Jstor, Social Science Research Network, ResearchGate, Harvard University HOLLIS Library Catalogue, Taylor Francis Online, ProQuest, and Wiley Online Library.

TERMINOLOGY

This section provides an understanding of the basic terminology used throughout the paper.

What is carbon pricing?

Carbon pricing assigns a price to carbon emissions with the goal of mitigating the negative externalities from greenhouse gas (GHG) emissions. It can be an effective tool to incentivize climate action because it incorporates the cost of emissions into economic decision-making. There are three main frameworks for carbon pricing: (1) carbon taxes, (2) compliance carbon markets or emissions trading systems (ETS), sometimes called cap-and-trade, and (3) voluntary carbon markets (VCM).[3]

What is a carbon tax?

A carbon tax levies a price on carbon consumption (generally fossil fuels), and governments collect the tax from emitters as set forth in the law or implementing regulation. While the name references carbon, a carbon tax can apply to other types of greenhouse gas emissions, like methane emissions from landfills, agriculture, or industry.[4] Carbon taxes vary in price, and, if set too low, may not cover the true cost of the negative externalities from the emissions.[5]

What is a compliance carbon market?

Under a compliance carbon market, or ETS, the governing body establishes regulations that set a limit or cap on emissions and mandate participation by certain emitters, such as power plants or other industrial operations. It then issues the regulated entities (emitters) carbon credits (like a permit) that are also limited to align with the total cap in emissions. There are a set number of credits determined by the governing body. Regulated entities that wish to exceed their emissions cap must purchase (trade) credits from other regulated bodies that have available credits or otherwise risk a fine for noncompliance. The carbon price in an ETS changes according to the market demand for emissions.[6]

Typically, in both compliance and voluntary markets, one carbon credit represents one metric ton of carbon dioxide equivalent that the relevant project either removes from the atmosphere or ensures are avoided altogether, such as when edible food is diverted from landfills to food banks for human consumption, and methane emissions are avoided in the landfill.[7]

What is a voluntary carbon market?

A voluntary carbon market (VCM) does not require participation from specific emitters but rather enables various stakeholders to participate voluntarily by purchasing carbon credits to offset their emissions based on verifiable standards. There is currently no global standardization for VCMs. There is potential to regulate the VCM that would not mandate participation but would instead provide guardrails to ensure integrity in the marketplace.

What is additionality?

Additionality represents the additional emissions reductions that are only possible because of the funding from an emissions reduction unit or offset. Additionality is an essential criterion for confirming an offset project's credibility in the marketplace — without it the emissions offsets are illusory.[8] To satisfy additionality, the project must achieve emissions reductions beyond those that were already occurring or that were going to occur absent funding from the emissions reduction unit or offset.[9] High-quality offset projects demonstrate additionality by showing that the finance from the offset unit is necessary to achieve the emission reductions.

WHY TARGET METHANE?

Methane is the world's second-largest contributor to global warming after carbon dioxide, contributing 20-30% of the global climate change over the last 200 years, and as mentioned above, methane emissions from landfills alone are expected to increase by about 70% as the population increases through 2050.[10] Although carbon dioxide is more abundant than methane in the atmosphere, a single molecule of methane more effectively traps heat than a single molecule of carbon dioxide. Methane traps over 80 times more heat than carbon dioxide over the first 20-year period, making it a much more concerning climate pollutant in the short term.[11]

But the lifetime of a methane molecule is shorter than that of a carbon dioxide molecule because natural chemical processes scrub methane out of the atmosphere more quickly than carbon dioxide. Therefore, if methane emissions were to decline and the natural chemical scrubbing of

methane maintained, atmospheric methane could decrease dramatically in just 10 years.[12] Decreasing the amount of methane put into the atmosphere could have a significant and nearly immediate impact on reducing the near-term effects of climate change, contributing to keeping global temperature change within 1.5 degrees Celsius.[13] Meeting the below-2-degrees-Celsius target will be challenging without incorporating methane reduction strategies

Food waste that decomposes in landfills is a significant source of methane, and diverting edible food from the landfill through food donation is a powerful lever for reducing methane emissions. Food loss and waste emissions accounted for 8-10% of global anthropogenic greenhouse gas emissions (carbon dioxide, methane, and nitrous oxide) between 2010 and 2016.[14] Using baseline data from 2015, global methane emissions from solid waste management are predicted to double by 2050.[15] Significant reductions in methane emissions can be achieved through improved landfill management.[16] Assuming it is possible to increase infrastructure to source, separate, recycle, and implement waste-to-energy recovery across the globe (including a prohibition on sending organic waste to landfills in the next 20 years), the potential exists to reduce 2050 baseline methane emissions by 80%.[17]

Diverting safe, nutritious food from the landfill to feed hungry people has the co-benefits of improving food security and mitigating methane emissions that contribute to global temperature rise. As policymakers are becoming increasingly aware of methane's potency and role in climate change, the amount of methane emissions caused by landfills, and the potential opportunities to use economic policies to divert food waste from landfills, governments are progressively enacting laws and regulations, including requiring organic waste diversion, imposing financial penalties for wasting food, or mandating the donation of edible, surplus food.[18] Food banks play a critical role in facilitating increases in food donation that result from such policies.

Scope of Emissions in Ecuador

In 2020, Ecuador was responsible for 0.20% of global greenhouse emissions, which is approximately 94.2 metric tons of CO2 equivalent.[19] Since 1990, Ecuador has seen total greenhouse gas emissions increase by around 25%.[20] The vast majority of the increase can be attributed to an increase in greenhouse gas emissions from energy, which has offset a 27%decrease in emissions from land-use change and forestry.[21]

In 2020, Ecuador became a net exporter of energy, due in part to the introduction of hydroelectric plants that came online in 2017.[22] Although the country is now producing more renewable energy that creates fewer greenhouse gas emissions, much of this renewable energy is exported to Colombia and Peru.[23] Domestic energy consumption is about 75% from petroleum, which has contributed to the increase in greenhouse gas emissions.[24]

Emissions from waste have more than doubled since 1990, and waste today accounts for about 13% of Ecuador's total greenhouse gas emissions.[25] Most food waste — which usually ends up in landfills — is included in the waste category of emissions.[26] Emissions from agriculture have remained relatively constant, with an increase of only about 1 metric ton of CO2 equivalent since 1990.[27] Since 2010, greenhouse gas emissions in Ecuador have plateaued, with a slight total decrease from 2019 to 2020.[28] This decrease is largely attributable to an approximately 14 %decrease in energy emissions from 2019 to 2020.[29] Given the dramatic shift in day-to-day activities stemming from the global

COVID-19 pandemic beginning in early 2020, it is difficult to determine if this favorable trend will continue as activities return to a more normal state.

2020 ECUADOR GREENHOUSE GAS EMISSIONS[30]

	Carbon	Methane	Total GHG[31]
Waste	n/a	12 MT CO2e	12.41 MT CO2e
Agriculture	n/a	8.57 MT CO2e	13 MT CO2e
Energy	32.46 MT	6.89 MT CO2e	39.7 MT C02e
Land-Use Change and Forestry	26.12 MT	6.55 KT CO2e	26.14 MT CO2e
Industrial Processes	1.97 MT	n/a	2.94 MT CO2e
Total	60.6 MT	27.5 MT CO2e	94.2 MT CO2e

The above data from Climate Watch[32] demonstrates that waste is a key source of methane emissions in Ecuador, much of which likely comes from food waste.

FOOD LOSS & WASTE IS ALSO A SIGNIFICANT PROBLEM

Food loss and waste (FLW) is one of the greatest food system challenges, occurring at every stage of the supply chain and generating significant social, environmental, and economic costs.[33] An estimated one-third of food produced globally is ultimately lost or wasted along the supply chain, amounting to approximately 1.3 billion tons of edible food each year, much of which ends up in landfills where it emits methane, a potent greenhouse gas with a concentrated global warming potential.[34] Aggregated data from 2007-2015 indicates that landfills are responsible for approximately 15% of global anthropogenic methane emissions, and research suggests that the contribution will likely increase as the global population increases.[35]

At the same time, global rates of hunger and food insecurity remained high and relatively unchanged between 2021 and 2023, after rapidly increasing in 2020 due to the COVID-19 pandemic.[36] One out of every eleven people in the world experienced hunger in 2023.[37] Around 2.3 billion people (29 percent of the global population) were moderately or severely food insecure in 2023 — 350 million more compared to before the outbreak of the COVID-19 pandemic.[38] The past decade saw an exponential increase in attention toward FLW, with the international community committing to halve FLW in the 2030 Agenda for Sustainable Development, reflected in Sustainable Development

Goal 12.3 ("SDG 12.3").[39] By redirecting food that would otherwise be lost or wasted to those who are hungry, the world can resolve the related issues of FLW and hunger.

FLW and Hunger in Ecuador

In Ecuador, FLW is estimated to be more than 900,000 tons each year.[40] Meanwhile, about 37% of the population experienced moderate or severe food insecurity between 2020 and 2022, with 13% experiencing severe food insecurity.[41] Ecuador has the second-highest level of chronic childhood malnutrition in Latin America, impacting 23% of children under 5 and roughly 27% of children under 2.[42]

FOOD RECOVERY IS A CRITICAL PART OF THE SOLUTION

Thoughtful public policies, including carbon pricing and other emissions reduction practices, can mitigate methane emissions while addressing the troubling mismatch between rates of food waste and rates of extreme hunger, and including food recovery in the policy framework is critical to the solution. Reducing food loss and waste results in sizable economic benefits to society, as it minimizes the costs associated with producing and discarding food that is never consumed. Food donation also helps mitigate the costs of hunger and stimulates the economy: Food recovery organizations provide jobs or sponsor community development, and recipients of donated food can spend their limited financial resources on other basic goods and services. Additionally, diverting food from landfills mitigates methane emissions, making food donation an essential climate solution as well.

In 2023, one food bank in Quito, Ecuador, participated in a pilot project for the Food Recovery to Avoid Methane Emissions (FRAME) methodology, developed by the Global FoodBanking Network and Carbon Trust to quantify the avoided emissions and co-benefits of food recovery activities that redistribute safe, edible food to feed people.[43] Completed in 2024, the pilot phase of the FRAME methodology demonstrated that food banking activities play a role in reducing emissions while also achieving the co-benefits of reducing food insecurity.[44] The participating food banks (one food bank in Quito, Ecuador (Banco de Alimentos Quito) and five foodbanks in the Mexican FoodBanking Network (*Red de Banco de Alimentos de México*, BAMX)) recovered over 30 million kilograms of food to avoid 816 metric tons of methane, or nearly 20, 400 tons of CO_2 equivalent.[45]

ECUADOR'S COMMITMENT TO CLIMATE MITIGATION

This section describes the Paris Agreement that the parties at the United Nations Climate Change Conference (COP21) adopted in December 2015, the pathways that Article 6 of the Agreement opens for emissions trading between countries, and Ecuador's Nationally Determined Contributions (NDCs) toward the Agreement's climate mitigation goals.

The 2015 Paris Agreement, adopted at COP21 and entered into force in November 2016, aims to limit the global temperature increase to below 2 degrees Celsius above pre-industrial levels, with countries working together to limit the increase to 1.5 degrees Celsius and achieve net zero emissions by 2050.[46] The Intergovernmental Panel on Climate Change (IPCC) suggests that by 2030, the world needs to limit carbon dioxide (CO_2) emissions to about 45% below 2010 levels and reduce methane emissions by about 33%.[47]

To achieve these goals, Article 4 of the Agreement requires signatories to establish Nationally Determined Contributions as a pledge for decreased emissions targets and a commitment to pursue policies that will mitigate emissions.[48] NDCs contain information on the country's targets, policies, and measures for reducing emissions and often include information on the country's financial and technical needs to meet their goals. They are a way for countries to communicate their climate adaptation priorities and the support that they might need to achieve those priorities.[49] As of 2020, countries are supposed to submit new NDCs to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCC) every 5 years (following guidance from the Katowice climate package), and subsequent NDCs must be more ambitious than the previous NDCs.[50]

Article 6 of the Paris Agreement recognizes that it is likely impossible for countries to meet their NDCs entirely from publicly financed projects. It encourages parties to cooperate with each other

to meet their NDCs and creates a framework for countries to use economic instruments to reduce the financial burden of ambitious emission mitigation targets.[51] Guidance emerged from COP26 in Glasgow that provided direction related to carbon markets.[52]

Article 6 requires emission reduction units to be real (represent real emissions reductions), verifiable by an independent auditor, quantifiable, additional (must represent emissions reductions above what would have occurred without the offset), enforceable, and permanent.[53] Furthermore, the guidance from COP26 expects that market-based cooperation activities between parties will positively contribute to sustainable development and poverty reduction.[54] The Agreement places renewed emphasis on the importance of activities delivering holistic benefits for climate mitigation and achievement of the United Nations Sustainable Development Goals.[55] Additionally, COP 28 established the Food Systems and Agriculture Agenda, formally recognizing that food system transformation is necessary to meet global climate goals and committing to develop policies and implementing practices that reduce FLW.[56] Activities supporting increased food donation are uniquely suited to meeting these goals.

While the Glasgow guidance was a good start in 2021, it took countries until COP29 in Baku, Azerbaijan, in 2024 to reach an agreement on standards for the Paris Agreement Crediting Mechanism (PACM) established under Article 6.4.[57] The PACM is a UNFCC-managed and monitored, carbon crediting framework that will allow for international carbon credit (emission reduction units) trading and will be open to countries and private actors.[58] There is still work to do before the PACM is fully operational, which could take a year or more, but establishing the standards was hailed by the negotiators as significant progress at COP29.[59] The United Nations Development Program also created the National Carbon Registry (NCR) as open-source software that is accredited as a digital public good and will serve as a data management tool for carbon trading.[60] The NCR can integrate with other measurement, reporting, and verification systems to help countries advance carbon markets, setting and meeting even more ambitious NDC goals.[61]

Ecuador's Nationally Determined Contributions

Ecuador ratified the Paris Agreement in 2017, and as part of the Agreement, Ecuador submitted its first NDCs in 2019.[62] Ecuador had previously submitted a 2015 intended NDC in anticipation of the Paris Agreement, and because of its enhanced commitments and implementation plans, it is appropriate to consider the 2019 NDC a follow-up to Ecuador's 2015 intentions.[63] In May 2021, Ecuador established its Implementation Plan of the First NDC, which aligns the NDC implementation with the priorities sectors in the National Climate Change Strategy 2012-2025 (discussed below).[64] Both the NDC and the Implementation Plan include multi-stakeholder input and consider climate change's impact on women, children, and other vulnerable groups.[65] The 2019 NDC intends to reduce emissions unconditionally (without international support) by 9% from the Energy, Agriculture, Industrial Processes and Waste sectors by 2025 as compared to the 2010 baseline scenario.[66] If international support is available (the conditional scenario), then Ecuador's 2019 NDC adds an 11.9% reduction across the same sectors, aiming for 20.9% total reduction for both scenarios.[67]

The 2019 NDC identifies the need for global financing and technology sharing to achieve the most ambitious emission reduction targets.[68] For example, Ecuador receives some financing for climate adaptation and mitigation projects from the Green Climate Fund (GCF), a climate financing

mechanism that the United Nations Framework Convention on Climate Change created to support climate projects in countries most vulnerable to climate impacts.[69] GCF supports projects in Ecuador related to agroforestry, reforestation, biodiversity, and coral reef protection.[70]

Ecuador did not specifically include FLW in its 2019 NDC.[71] But the document highlights waste as a general category under its adaptation and resilience areas.[72] It also explicitly commits to reducing poverty and inequality, advancing sustainable development, and promoting the rights of nature, which all align with increasing food donation to reduce food loss and waste, thereby decreasing methane emissions.[73] The NDC also references food security as a priority; as discussed further below, reducing food loss and waste through food donation can increase food security.[74]

Ecuador submitted its second NDC in February 2025, with an implementation period expected from 2026 to 2035.[75] The 2025 NDC updated the first NDC commitment to a 5% reduction by 2025 and established new emissions reduction commitments as a 7% reduction in the unconditional scenario and an 8% reduction in the conditional scenario during the ten year implementation period (2026-2035).[76] In the 2025 NDC, Ecuador acknowledged that almost 55% of emissions from the country's waste sector correspond to organic waste.[77] Accordingly, Ecuador committed to reducing organic waste through a circular economy approach (that should prioritize keeping food in the human supply chain when possible) as one of the objectives it would pursue to meet the NDC's emission reduction goals from 2026-2035.[78]

Ecuador's Constitution and the Rights of Nature

Core to the foundation of Ecuador's NDC is its 2008 Constitution, where Ecuador was the first country in the world to guarantee rights to nature.[79] Article 71 states that "*Pacha Mama* (Nature), where life is created and reproduced, has the right to integral respect for its existence, maintenance, and regeneration of its life cycles, structure, functions, and evolutionary processes."[80] Additionally, Article 13 of the 2008 Constitution establishes the people's right to food in Ecuador, and Article 14 identifies the right to a healthy and ecologically balanced environment.[81] More explicitly related to climate change mitigation, Article 414 of the 2008 Constitution requires the government to adopt intersectional measures that protect at risk populations; limit greenhouse gas emissions, deforestation, and air pollution; and preserve forests and vegetation.[82]

The constitutional rights of nature inform Ecuador's approach to climate mitigation strategies. For example, (and as explained more in the later section on carbon markets), Ecuador does not currently have a regulated or voluntary market for carbon credits, due in large part to uncertainty around the interpretation of **Article 74 of Ecuador's Constitution**. Article 74 states that:

> **Persons, communities, peoples, and nationalities shall have the right to benefit from the environment and the natural wealth, enabling them to enjoy the good way of living.**
>
> **Environmental services shall not be subject to appropriation; their production, delivery, use, and development shall be regulated by the State.[83]**

Some have interpreted this grant of rights to nature as a limitation on the commodification of natural resources that would prevent the development of a carbon market or any similar economic policy instrument.[84] Others have interpreted the language as allowing the development of such markets, so long as the State is responsible for their regulation.[85] The ultimate responsibility for resolving these competing interpretations lies with Ecuador's Constitutional Court, an issue that is further explored in the below *Carbon Markets* section, which starts on page 18.[86]

National Climate Change Strategy

Ecuador's National Climate Strategy is a comprehensive development strategy that outlines objectives from 2012-2025 and integrates Ecuador's climate goals across sectors, including food, agriculture, and livestock sovereignty; fishing and aquaculture; water supplies and ecosystem maintenance; vulnerable populations; tourism development; and infrastructure improvements.[87] The strategy includes solid waste management, agriculture, land use, energy, and industrial processes as priority targets for reducing emissions. Its primary goal is to protect Ecuador's biodiversity and the rights of nature set forth in the Constitution.[88]

The strategy establishes three plans for implementation: (1) the National Plan for the Creation and Strengthening of Conditions, (2) the National Adaptation Plan (NAP), and (3) the National Mitigation Plan (NMP). The National Plan for the Creation and Strengthening of Conditions is the foundation for the other two plans.[89] The strategy identifies the Ministry of Environment, Water, and Ecological Transition (*Ministra del Ambiente, Agua y Transición Ecológica*, or MAATE) and its Undersecretary for Climate Change as the government institutions responsible for implementing the strategy and related plans.[90] Ecuador began working on the NAP in 2017 and published a plan for 2023-2027 in March 2023.[91]

ECONOMIC INSTRUMENTS IN ECUADOR'S CLIMATE POLICY FRAMEWORK

The following section considers how Ecuador has started implementing its climate change mitigation plans through the Zero Carbon Program (*Programa Ecuador Carbono Cero*, (PECC)), as well as the potential for Ecuador to integrate other economic instruments into its climate policy framework, including carbon markets and a carbon tax, while keeping in mind the political landscape's impact on the capacity for implementation. It also shares considerations for food banks that are interested in participating in an offset framework like the PECC or a carbon market. Because the action opportunities for the PECC and potential carbon markets align, they are presented together after the carbon market discussion.

Zero Carbon Program (Programa Ecuador Carbono Cero, or PECC)

Ecuador has chosen an innovative approach, called the Zero Carbon Program, to incentivize emissions reductions. The PECC program is a voluntary verification program that promotes emissions reductions through three stages: (1) Quantifying Emissions, (2) Reducing Emissions, and (3) Carbon Neutrality through Compensation. Participating entities that meet the requirements of each voluntary

program component earn a carbon footprint quantification certification (for measuring emissions using an approved protocol), a carbon footprint reduction certification (for emissions reductions), and a carbon footprint neutrality certification (for achieving carbon neutrality by compensating environmental projects with emission credits purchases).[92]

Each program component is voluntary, but entities must complete the component requirements sequentially, starting with level one (quantifying) before moving to level two (reducing) and finally progressing to level three (neutrality). One of the main features of the PECC is the incentive structure for completing each stage, which includes a certification label that companies can use in their marketing materials.[93] Entities that quantify their emissions using a government-approved protocol are eligible for the Green Initiative Distinction (valid for one year), those that reduce emissions based on an approved protocol are eligible for the Green Dot Certification (valid for two years), and those that achieve carbon neutrality through the compensation program are eligible for the Green Point Certification (valid for three years).[94] MAATE has published regulations that apply to organizations seeking these certifications as well as regulations specific to products that may be offered with claims about GHG emissions.[95] The remainder of this section will focus on the third component of the PECC that targets carbon neutrality through a compensation and offset credit framework.

The PECC's carbon footprint neutrality component incorporates offset elements (like a carbon market) within a more structured framework that includes guardrails to bolster the credibility and integrity of reported emissions reductions.[96] While the government is still developing and finalizing technical guidance to implement the PECC, the regulations make clear that the government will play an important role in ensuring transparency and determining the veracity of offset projects, ensuring compensation for organizations that implement agreed upon projects, and respecting the rights of nature as established in the Constitution.[97]

Under the PECC's carbon footprint neutrality component, organizations with capacity to reduce or sequester greenhouse gas emissions (such as a food bank, in the case of this report), would design a project (e.g. preventing food from entering a landfill where it will decompose and produce methane) that complies with technical guidance published by the government.[98] Once the project is designed, the Conformity Evaluating Body (*Organismo Evaluador de la Conformidad*, or OEC) evaluates the project.[99] Once the OEC verifies and validates the project, the food bank or other organization may then request the project be listed in the government's Offset Portfolio.[100] From there, an entity that has completed the previous PECC components and that is interested in offsetting their emissions for carbon neutrality may identify projects in the government's Offset Portfolio that align with their business goals and then negotiate with the organization implementing the project, like a food bank,

to determine the price for the offsetting activities.[101] When the parties reach an agreement, the organization offsetting their emissions pays money into a fund administered by the government, called the Trust Fund, which retains a commission and then distributes the funds to the organization implementing the project.[102]

While the government is still developing the compensation program and guidance given thus far is not yet official, the regulations frame several program requirements. For instance, offset projects must be actual, permanent, additional, verifiable, avoid double counting, traceable in a single registry, and transparent.[103] Methodologies to measure the impact of a proposed project may include methodologies currently being used for voluntary carbon market projects, so long as they are approved by the MAATE.[104] The regulations also include monitoring and verification requirements for each project that include collecting, recording, and analyzing data to confirm the veracity of the project.[105]

The PECC resembles a regulated voluntary carbon market because while participation is voluntary, the government has established a centralized offset registry that it regulates. Although the PECC resembles a VCM because it allows entities to elect to pay for emissions reductions that they are unable to achieve on their own, it is distinguishable from a VCM in two significant ways. First, while the regulations refer to offset emissions units as Emission Compensation Units (*Unidades de compensación de emisiones,* or UCEs) that are equal to one ton of CO2 equivalents,[106] the guidance makes clear that the UCEs are not tradeable or marketable as a commodity between entities, which distinguishes them from carbon credits or offsets in a carbon market.[107] The approach also aligns with Constitutional principles about not commodifying nature.

Second, the PECC's requirements for offset projects are more robust than a traditional voluntary carbon market. For instance, the program requires "implementers," or those who undertake projects to reduce GHG emissions, to include co-benefits in their projects that promote at least one other environmental, social, or cultural improvement beyond the project's emissions reductions.[108] The regulations include a non-exhaustive list of co-benefits, which for food recovery organizations may include working with local communities and groups experiencing an unmet need; supporting poverty reduction and community improvement; and empowering women by increasing equality in decision-making, or implementing other efforts to reduce gender disparities.[109] The PECC regulations also outline that all projects in the Offset Portfolio must ensure that food production did not occur on land deforested after 2018 and must mitigate and account for other potential indirect effects of the project that could increase GHG emissions.[110]

Considerations for Food Recovery Organizations Interested in Carbon Offset Frameworks

Entering and participating in a carbon offsets framework, such as the PECC or a carbon market, requires a significant resource commitment from the food bank. While food banks will likely work with a consulting organization to facilitate their emissions reduction projects, the food banks must devote time and administrative resources to calculating the emissions reductions from their food donation activities to determine the market value of their credits. The consultants also have fees that add to the food banks' costs, and the fees would likely vary depending on the project's size and location.

The PECC requires government approval of participating projects and their methodologies for emission reductions, and most carbon market standards require third-party auditors to verify the offset project's emissions reductions, all of which would also add to a food bank's cost. Administering emission credit sales and tracking emissions reductions also requires dedicated resources from the food bank, including investments in technology. While food banks would likely have to pay most costs when initially entering the market, the increased revenues from the UCE or carbon credit sales could mitigate the costs if the price for the emission credits is high enough and the food bank has the capacity to offer and sell enough credits to cover the costs. Food banks will need to consider if participation in the emissions credit or offset market is a worthwhile investment by comparing the costs of data collection, monitoring, and verification requirements with the expected price and sales of the offset credit.

Like carbon markets, the PECC's carbon neutrality component requires additionality.[111] Project activities must result in additional emissions reductions compared to what would occur under business as usual, absent any additional funding that would come from the UCE or offsets. The Food Loss and Waste Law in Ecuador (*Ley para Prevenir y Reducir la Pérdida y el Desperdicio de Alimentos y Mitigar el Hambre de las Personas en Situación de Vulnerabilidad Alimentaria*), which is discussed in more detail below on pages 22-23, includes a ban on throwing away food that is safe for human consumption, and it provides a hierarchy of alternative uses for the food, starting with food donation before moving to animal feed, industrial reprocessing (to create new raw materials and products or produce alternative energy), composting, and landfill use.[112] Demonstrating additionality may be challenging for food recovery projects in Ecuador because the law effectively already requires emissions reductions by banning food from landfills. But additionality could still be possible considering that the law only suggests food donation as one of several alternative uses, and other uses in the hierarchy, like composting and alternative energy generation, may produce more emissions.

Additionality is a particular concern for food recovery projects interested in participating in an offset framework because demonstrating additionality requires significant data collection and potential adjustments to food recovery processes. Food banks that want to participate in the PECC or a high-quality carbon market should develop a project that demonstrates additionality by showing that emission reductions could not have occurred without the funding from the UCE or the carbon offset. In other words, the food bank would satisfy additionality by showing that the food bank needs the UCE investments to overcome a financial, institutional, regulatory, or social barrier to its food recovery activities, and the offset investment would not be replacing one of the food bank's already existing funding streams, such as grant funding.[113] Critics of offset frameworks often raise concerns with additionality, and potential offset program participants should be prepared with data to support their project's additionality claims as a best practice.[114]

One way for food banks to address additionality is to maintain accurate records of the various funding streams that show the specific food recovery and donation operations each funding stream supports — so that it is clear that the food donations supported by grant funding or charitable donations are separate from any food donations funded by carbon credit investments. In a country like Ecuador, where existing law already effectively requires emissions reductions by prohibiting food disposal in the landfill,[115] it will be necessary to review the forthcoming regulations to understand what the law requires and how it changes the baseline emissions scenario for a potential food recovery project. When the surplus food is recovered from a destination other than landfill, such as composting, anaerobic digestion, or animal feed, fewer emissions are avoided because of the food recovery, and more food recovery activities are needed to avoid a ton of CO_2 equivalent emissions. More research is needed to support food banks in developing PECC or other offset projects that meet various additionality criteria.

Carbon markets

This section provides an overview of the recent attempts to authorize carbon markets in Ecuador and the Constitutional questions that carbon markets present in Ecuador. Considering the recent authorization attempts occurred after Ecuador established the PECC, it is worthwhile to explore the status of and potential for carbon markets in the country. Action opportunities for the PECC and potential carbon markets follow this section.

In early 2023, Ecuador's Lasso Administration referred eight questions to voters, one of which would have amended Article 74 and explicitly authorized carbon markets and other similar payments for ecosystem services.[116] The referendum failed.[117] Following the vote's failure, the National Assembly initiated voting on a legislative proposal that would have granted the Ministry of Environment the authority to design and implement rules for carbon markets.[118] However, President Lasso dissolved the National Assembly in May 2023 and called for new elections before a second and final vote could take place.

In September 2024, the National Assembly approved a Draft Law to Reform the Organic Code of the Environment (*Código Orgánico Ambiental* (COA)), that addressed compensation for ecosystem services and provided a pathway to develop and regulate the voluntary carbon market in Ecuador, but President Noboa vetoed the law because, among other things, he was concerned about the voluntary carbon market's credibility and accuracy, as well as the constitutionality of compensation for ecosystem services through funds not otherwise authorized by the government.[119]

As a result, carbon markets are not currently authorized in Ecuador, and there appear to be conflicting opinions about what is feasible. President Lasso's decision to refer the question of amending Article 74 to allow carbon markets to voters suggests a belief that a Constitutional amendment is necessary to allow carbon markets. Meanwhile the National Assembly's legislative proposals suggest carbon markets would be allowed without amending the Constitution if any such markets are regulated by the government, albeit the President would need to approve any such proposal. These competing interpretations of Article 74 indicate the legality of carbon markets in Ecuador is an unsettled issue.

Ecuador's Constitutional Court has not directly answered the question of whether Article 74 allows a carbon market or similar emissions offset program like the PECC. It has, however, confirmed that

the rights of nature in Ecuador's 2008 Constitution are actual, not just aspirational.[120] In the *Estrellita Monkey* case, the Constitutional Court confirmed that an individual woolly monkey had rights that could be exercised under the Constitution, and the government had an obligation to not only protect the species or nature in general, but also to protect individual animals.[121] The Constitutional Court's affirmative grant of actual rights to nature in this case suggests that the rights afforded to nature under Articles 74 are meaningful, substantive rights the state must protect rather than goals the state can choose to pursue. While the Constitutional Court has not yet weighed in on the legality of carbon markets under Article 74, the prevailing thought seems to be that carbon markets are not currently allowed, and either a Constitutional amendment or legislative authorization with Executive approval is necessary to make them legally permissible.[122]

Given the uncertainty of whether carbon markets are permissible in Ecuador, it is difficult to determine what role food recovery organizations and other NGOs may play in such markets. If the Constitutional Court decides that carbon markets are allowed under the Constitution or the government passes a law authorizing such markets in line with the Constitutional Court's interpretation of Article 74, food banks and other NGOs will be well positioned to assist with methane emission reductions by preventing edible food from being sent to the landfill.

Action Opportunities for the PECC & Potential Carbon Markets

When MAATE provides technical guidance to implement the Zero Carbon Program for waste management activities, it should:

- *Use language that ensures food recovery organizations, such as food banks, can participate with projects that prevent food from entering the landfill and emitting methane.*

  Technical guidance for waste management projects should be written in a way that focuses on the core requirements for documenting emissions reductions and that avoids limiting types of projects that may accomplish those reductions. A broader approach to the guidance that focuses on ensuring the integrity of the underlying project rather than specific types of eligible projects, would allow food banks — which may not typically be associated with waste management activities — to benefit from the program financially while providing an opportunity for other entities to offset their own emissions.

- *Provide guidance on how food recovery projects can meet the additionality element required by the PECC, considering the organic waste ban that is currently being implemented under Ecuador's Food Loss and Waste Law*

  Both carbon markets and the PECC's carbon neutrality component require additionality. Project activities must result in additional emissions reductions compared to what would be possible under business as usual, absent the additional funding that would come from the UCE or offset.

  Guidance on how to demonstrate additionality in food recovery projects — when the business-as-usual scenario under the Food Loss and Waste Law effectively requires emissions reductions by banning food disposal in landfills but does not mandate food donation as the only alternative use — would help food recovery organizations determine the extent to which they can participate in the PECC or another offset framework like a carbon market. Such guidance

could also help to ensure support for donation, which provides more benefits compared to some of the other alternative uses for the food, such as composting and alternative energy generation.

To reduce methane emissions and promote food recovery projects in the PECC and any potential carbon market, policymakers should:

- *Aid food recovery organizations interested in participating in emissions offset programs like the PECC.*

  Considering the high costs around project development, monitoring, and third-party verification, policymakers could also provide grants or other financial assistance to food banks and other food recovery organizations interested in participating in carbon offset programs like the PECC or a potential carbon market.

- *Ensure robust data collection.*

  Collecting baseline data on food loss and waste and food donations can help determine the potential effectiveness of food recovery projects in the PECC's carbon neutrality component and the impacts of any food loss and waste regulations. The data can then be used for a variety of other measures, including calculating the potential greenhouse gas emissions avoided by instituting a food donation requirement or joining a potential future compliance carbon market. Policymakers should authorize grants to support robust data collection related to food loss and waste and resultant emissions.

Carbon tax

Ecuador has not established a carbon tax, and there is no indication that the government is planning to consider implementing a tax on carbon. In 2020, the country reformed its formula for determining petroleum and diesel subsidies in a way that would encourage more efficient use of petroleum products and reduce price swings.[123] The new formula reflects a shift to a more market-based pricing mechanism for gas and diesel, reduces government subsidies, and caps swings in pricing to plus or minus 5%.[124] According to the International Monetary Fund, the reformed subsidy is similar to a carbon tax that has the added benefit of freeing up revenue from the reduced subsidy, which could be used for investments in green energy.[125]

Action Opportunity

If the National Assembly were to pursue a carbon tax, policymakers could:

- *Include support for food waste reduction activities in the legislation.*

  If the National Assembly were to pursue a carbon tax, the tax law could create a fund for a portion of the carbon tax revenues to provide grants to food waste reduction projects, such as food donation or recovery infrastructure projects.

  Ensuring that carbon tax revenue funds food recovery projects that keep food out of the landfill is one way that additional funding could be directed to food banks to bolster their infrastructure and support their methane-reducing activities (i.e., food recovery that diverts food from the landfill). Grant funding could provide the needed financial supports for food

banks that will likely receive increases in donations because of Ecuador implementing its Food Loss and Waste Law (discussed on page 23 of this report).

METHANE LEGISLATION

Ecuador does not currently have legislation that directly addresses methane emissions as it relates to food waste. The Government of Ecuador, however, has acknowledged the importance of reducing methane emissions and has committed to working with non-governmental partners to reduce such emissions, including an endorsement of the Global Methane Pledge.[126] Under the Pledge, participants commit to voluntary measures to reduce methane emissions by 30%from 2020 levels by 2030.[127] Further, the Government has finalized regulations to eliminate routine flaring in oil and gas developments and to remove all flares near populated areas.[128]

While it was not touted as legislation to reduce methane emissions, the Law to Prevent and Reduce Food Loss and Waste and Reduce the Hunger of People in Vulnerable Situations (*Ley para Prevenir y Reducir la Pérdida y el Desperdicio de Alimentos y Mitigar el Hambre de las Personas en Situación de Vulnerabilidad Alimentaria*), discussed more fully below, does have the potential to meaningfully reduce methane emissions when fully implemented. The law prohibits food manufacturers, retailers, and others throughout the supply chain from destroying food that is fit for human consumption. As food is kept out of landfills and used for beneficial purposes like feeding people, less methane will enter the environment from food decomposing in landfills.

Action Opportunity

To strengthen commitments to methane reduction, policymakers should:

- *Codify the commitments in the Global Methane Pledge and use food donations to help meet methane emission reduction targets.*

  Ecuador can establish methane regulations and codify its voluntary commitment to reducing methane emissions. Further, including landfills in methane regulations could work in tandem with the Food Loss and Waste Law.

FOOD WASTE DETERRENCE & OTHER POLICIES TO PROMOTE FOOD DONATION

This section outlines Ecuador's food waste deterrence policies that act as levers to promote food donation and thereby reduce methane emissions from landfills. Food waste deterrence laws and policies aim to reduce food waste and increase food recovery by making food waste financially burdensome.[129] Food waste deterrence laws may restrict or ban organic waste disposal, require food donation, penalize food waste, or use other policy designs.[130]

Food Waste Deterrence Policies: Ecuador's Food Loss and Waste Law

In May 2022, Ecuador passed the Food Loss and Waste Law.[131] The law requires anyone involved in the "production, processing, distribution, marketing and importation of food products" to not destroy food that is safe for human consumption and the law sets out fines for those who do.[132] The law includes a hierarchy of alternative uses, including donating to a food bank, feeding animals, producing renewable energy, and composting.[133] Anybody who chooses to destroy food must show that the food was no longer edible and that no alternative under the hierarchy of acceptable uses was possible.[134] The fines authorized by the law do not apply to small-scale food manufacturers and sellers, such as street vendors.[135]

The Food Loss and Waste Law was a priority of Ecuador's former President Moreno and was passed by the National Assembly shortly after President Moreno left office, but President Lasso, who followed President Moreno, did not prioritize implementation of the law. Most recently, in January 2024, current President Noboa issued overarching regulations to initiate implementation of the law, which included additional timelines for relevant agencies to draft their own implementing regulations.[136] As a result of delays caused by the change in administrations, safe and edible food is still going to landfills where it contributes to methane emissions. Within the National Assembly, Assemblywoman Lucia Placencia is vice president of the Assembly's Food Sovereignty Commission, and she was supportive of the Food Loss and Waste Law.[137] In addition to her leadership, there seems to be more assembly members interested in reducing food insecurity who could be advocates for additional measures to increase food donations, and thereby reduce the amount of food entering landfills causing methane emissions.[138]

Other stakeholders also want to see the law progress. Both food banks in Ecuador — one in Quito and one in Guayaquil — are interested in finalizing the regulations to implement the Food Loss and

Waste Law. Similarly, National Association of Food and Beverage Manufacturers (ANFAB) expressed interest in finalizing the regulations and has submitted draft proposed regulations to Ecuadorian Service for Standardization (*Servicio Ecuatoriano De Normalizacion*, INEN).[139] INEN is the national agency responsible for standards development. The Food Loss and Waste Law directed INEN to draft and implement sanitary regulations.[140]

Action Opportunity

To promote food recovery activities and deter food waste from emitting methane in landfills, policymakers in Ecuador could:

- *Draft regulations to implement the Food Loss and Waste Law.*

  Shortly after taking office, President Daniel Noboa took the first steps toward implementing the law by publishing an initial framework that includes regulatory definitions, high-level procedures that require food banks and donors to report on the amount of food that is donated, and a timeline for relevant agencies to publish their own regulations to implement the law.[141] Maintaining the consistent timelines in the framework will ensure that the Food Loss and Waste Law progresses and the resultant food waste mitigation activities can improve methane emissions.

Tax Benefits for Food Donation and Recovery

Ecuador does not currently provide any tax incentives that would encourage broad-scale food donation, although it does provide a deduction for certain donations to nonprofit organizations that work to address childhood malnutrition.[142] The Lasso Administration reformed Ecuador's tax code shortly after taking office in 2021 and did not directly or indirectly include any benefits for food donation, food recovery, or food waste prevention outside of the provisions supporting nutrition for children and infants.[143] The Food Loss and Waste Law includes a mandate that both the national government and provincial governments must consider whether tax incentives for food donation would be appropriate, but no evidence suggests this has taken place yet.[144] New elections took place in October 2023 and it remains to be seen whether a new administration will prioritize consideration of such tax incentives.

Action Opportunities

To encourage more methane-mitigating food donations, policymakers could:

- *Offer tax incentives for food donations made to food recovery organizations and other intermediaries.*

  Tax incentives for food donations encourage people to donate more food and help to offset the costs of handling and transporting food for donation. Given that the Food Loss and Waste Law prohibits destroying food that is safe for human consumption, a tax incentive would encourage potential donors to choose donation over the other allowable alternatives.

  While the Food Loss and Waste Law, when fully implemented and enforced, will have the effect of keeping food out of landfills, a tax incentive for donations may help industry as they build out the infrastructure that will allow them to keep food out of landfills. For instance, a

potential donor may decide that disposing of food as compost is an easier alternative than storing and delivering food to a food bank. To avoid this possibility and encourage potential food donations, the government should offer tax incentives for donors that choose to send food to recovery organizations instead of other available alternatives under the Food Loss and Waste Law.

Furthermore, while a tax deduction may encourage food donation among certain corporate donors, offering a tax credit for food donation is more likely to encourage donation among farmers and smaller donors that may not generate as much income during the year. Compared with a tax deduction, which reduces a taxpayer's taxable income and is then used to determine the (lowered) amount of taxes that must be paid, a tax credit is a direct dollar-for-dollar subtraction from the taxes owed. Tax credits are also applied evenly across tax brackets and would therefore have a greater impact for small, low-revenue businesses than a tax deduction.[145]

- *Provide a tax incentive for activities associated with the collection, storage, transportation, and delivery of donated food.*

  A tax incentive for activities associated with the collection, storage, transportation, and delivery of donated food should be considered to help offset the costs of donation and encourage actors in the food supply chain to invest in infrastructure that will facilitate food recovery activities.

Enhancing Food Recovery from Agricultural Producers

Agricultural producers often produce more food than they can sell. In some instances, prices at the time of harvest may be too low to justify the cost of harvesting a product while at other times, a lack of infrastructure like cold storage facilities means safe, edible food ends up rotting in the field. In conversations with stakeholders involved in food recovery work and representatives from related industries,[146] there seems to be support for increasing financial incentives for those who will be required to elect an alternative use for the surplus, edible food from the hierarchy in the Food Loss and Waste Law, which starts with and prefers food donation.[147]

Increased financial incentives would help cover some of the costs associated with collecting, storing, and transporting donated food. Offsetting some of the financial burdens associated with food recovery may help increase food donations and encourage the development of systems that allow more food to be donated while it is still edible. Moreover, because the Food Loss and Waste Law's implementing regulations have not yet been finalized, additional incentives may encourage those in industry to support an expansive donation requirement in the regulations when they are written instead of trying to limit the scope.

Action Opportunity

- *Provide grants or tax incentives to encourage development of robust food recovery systems that will ease implementation of the Food Loss and Waste Law.*

  Grants and tax incentives should be available to producers to offset the costs associated with harvesting and donating food when prices are too low to be commercially viable. Funds

and tax incentives should also be made available for infrastructure (like cold storage and transportation) that would allow farmers to safely store and transport food to food recovery organizations.

CONCLUSION

Policies that support food recovery and redistribution work not only to address social concerns such as poverty and high rates of food insecurity, but also to mitigate methane emissions by reducing the amount of organic waste decomposing in landfills. As emissions reduction programs like the PECC continue to develop in Ecuador, it is essential to include food banks in the policy conversation from the start to ensure effective policy implementation and increased food recovery, thereby maximizing methane emissions reductions.

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