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A research brief describing a logic model framework for planning a Food Recovery Network chapter at an undergraduate university

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Abstract

In the United States, both food security and food waste are critical issues for population health and well-being. Approximately 13.5% of U.S households experienced food insecurity in 2023. In a given year, an estimated 22 million pounds (10 million kg) of food are wasted in college campus dining halls. Food Recovery Network (FRN) student-led chapters work to reduce food waste on campus, connect food-insecure populations with excess food, and provide various opportunities for students to participate in activities related to food security and food sustainability. This research brief describes the development of a logic model framework for planning an FRN chapter at an undergraduate university in Lehigh Valley, Pennsylvania, and initial outcomes from Weigh the Waste events and a food drive. A logic model was developed to outline the situation, priorities, inputs, outputs, outcomes, assumptions, external factors, and FRN chapter evaluation plan. The main outputs include regular FRN chapter meetings, FRN chapter social media outreach, collaboration with community-based organizations, Weigh the Waste events to address campus food waste, and food drives to provide resources for organizations serving food-insecure populations. For the Weigh the Waste events, a total of 529 lbs. (240 kg) of food waste, 296 lbs. (134 kg) of beverage waste, and 88 lbs. (40 kg) of plastic utensil waste was collected from 1,555 dining hall visitors during four meal periods. For the food drive, 1,618 items totaling 548 lbs. (249 kg), including food, toiletries, and cleaning supplies, were collected and donated. FRN chapters at other universities may find this model useful for program planning and for the sustainability of the student group over time.

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Keywords
logic model, program planning, food recovery, food insecurity, food waste, higher education, student engagement

Introduction

This article describes (1) the development of a logic model framework for planning a Food Recovery Network (FRN) chapter at an undergraduate university in Lehigh Valley, Pennsylvania, and (2) two implementation case studies including Weigh the Waste and a campus food drive. This logic model could be used by students and faculty at other universities to outline key stakeholders and plan short-term and long-term activities to work toward higher impact strategies for reducing both food insecurity and food waste on campus and in their local communities. This detailed planning is needed for measurable and sustainable outcomes and is valuable for transitions since students on campus change every few years.

Food Insecurity

Food insecurity is defined as limited or uncertain access to adequate food on a household level (U.S. Department of Agriculture Economic Research Service [USDA ERS], 2024-a). Approximately 13.5% of U.S. households were food-insecure at least some time during 2023, and around 5.1% experienced severe food insecurity, where normal eating patterns were disrupted and food intake of some household members was reduced (USDA ERS, 2024-b). As of 2022, 11.9% of residents and 16.6% of children in Pennsylvania were food-insecure (Pennsylvania Department of Agriculture, n.d.). Similarly, 11.4% of residents in the Lehigh Valley were food-insecure as of 2022 (Hake et al., 2024). Federal data reports that across the U.S., about 23% of undergraduates and 12% of graduate students experienced some level of food insecurity during their academic career (Cameron et al., 2021). The physical health impacts from prolonged food insecurity include anemia, heart disease, high blood pressure, and obesity (OoNorasak et al., 2022). Populations experiencing prolonged food insecurity are also at higher risk of psychological impacts, including stress, anxiety, and depression (Ejiohou et al., 2024).

Food Waste

Along with food insecurity, food waste is a significant public health and sustainability issue. Around 30-40% (approximately 133 billion pounds or 60 billion kg) of food produced in the U.S. is wasted. This equates to US$161 billion worth of food wasted on a yearly basis (Buzby et al., 2014). In 2022, approximately 6.2 billion pounds (2.8 billion kg) of food was wasted in Pennsylvania; almost 60% of this was wasted at the residential level, and the remainder was wasted at the retail and manufacturing levels (Parwani & D'Onofrio, 2024). Approximately 22 million pounds or 10 million kg of food are wasted annually in college campus dining halls across the U.S. (Tobler, 2019). Discarded food, specifically fruits and vegetables that are nutrient-dense and are prone to spoilage, leads to lost potential for adequate nutrition and can lead to health issues related to obesity, heart disease, type 2 diabetes, and other chronic illnesses associated with shelf-stable diets (Sharma et al., 2017).

Along with human health issues, food waste contributes to environmental concerns. Discarded food sent to landfills and incinerators produces significant amounts of CO_2 and methane, two greenhouse gases (GHGs) driving global climate change. Overproduction of food from industrial agriculture uses water, fuel, fertilizer, and pesticides, leading to water shortages, water contamination, and additional discharges of GHGs and further exacerbation of climate change effects (Hall et al., 2009).

Food Recovery Efforts on University Campuses

Students living in a college setting face many of the same issues as a residential community in regard to equitable food access–location, logistics, and finances (Evans & Roggio, 2023). Their nutrition and food knowledge may also be similar. Many campuses have stop-gap measures in place, such as food pantries, which have a marginal effect on food security among students (OoNorasak et al., 2022). Additionally, many college students today are deeply concerned with climate change, sustainability, and food security, though their awareness of and passion for these issues does not necessarily lead to measurable action (Genovese, 2022). Lastly, college campuses represent a significant contribu-

tor to unsustainable food practices, given the millions of pounds of food wasted at college dining halls every day. Providing a framework on campus from which students can participate in sustainability activities has the potential to positively impact students' behaviors, skills, and values regarding food waste and sustainable living (Brophy et al., 2022).

Colleges and universities in the U.S. have implemented various initiatives to address food security and food waste. Student-led campus kitchens invite campus and local community members to learn new ways of healthy cooking using recovered food from campus dining halls (OoNorasak et al., 2022). Some campuses, including Moravian University (MU), have made a commitment to dedicate a percentage of their dining budget to purchase locally produced, ethical, or sustainable food products (Berger et al., 2022). Others have established community gardens (Schrager et al., 2023), food pantries (Jones et al., 2024), or a combination of strategies to recover unused food and improve nutrition for the populations they serve.

Campus organizations such as the Food Recovery Network (FRN) work to reduce food waste on campus and connect food-insecure populations with excess food (OoNorasak et al., 2022). FRN was created by students in 2011 at the University of Maryland, College Park. Since its inception, FRN has worked to recover over a million pounds or 450,000 kg of food at nearly 200 campuses across the U.S. through food diversion initiatives, social media campaigns, and partnerships with local institutions (Food Recovery Network, n.d.). During fall 2021, the FRN reached out to an MU faculty member to share more about the mission and to recruit students and faculty to start an FRN chapter. A public health student founded the FRN chapter, which was derived as part of a sustainability internship with Sodexo. Additional public health students were recruited for leadership positions in the club, and an official application was submitted and accepted by the MU United Student Government. Undergraduate student members were recruited to join; common majors of those joining include public health, health sciences, and environmental science.

Sustainability Initiatives on Moravian University's Campus

MU is located in Bethlehem, Pennsylvania. It is one of six colleges in the Lehigh Valley Association of Independent Colleges (LVAIC). As of fall 2023, a total of 2,658 students were enrolled in MU undergraduate and graduate programs, and approximately 53% of undergraduates reside on campus (Moravian University, n.d.-a). MU employs 152 full-time faculty, 214 part-time faculty, and 372 staff members (Moravian University, n.d.-a). More than 90% of MU students receive some form of financial aid (Moravian University, n.d.-b). Over 41% of students living on campus and 54% of students living off campus or commuting reported that they did not have enough money to cover all of their expenses (Cann, 2018). Previous surveys on campus had identified food insecurity as an issue for MU students (Cann, 2018).

The MU Sustainability Committee was established in 2009 and comprises eight faculty members, along with students, staff, and alumni. Although students serve on the Sustainability Committee, active student participation in sustainability initiatives has been limited. The goal of the committee is to promote and potentially fund sustainability efforts on campus. One such effort to address food issues is the implementation of the Food for All app, which connects students with excess food from university or department events. Due to restrictions internal to the app's interface, enrollment in Food for All is limited to 200 students, approximately 7.5% of the overall MU student population. Additionally, the Sustainability Committee supports Mo's Cupboard, an on-campus food and resource pantry that offers shelf-stable food products, cleaning supplies, toiletries, and community resources to MU students.

MU's dining services are managed by Sodexo, an independent company contracted with Moravian. Sodexo oversees full-service dining halls and three to-go locations. In 2015, MU was named one of the greenest colleges in the nation by the Princeton Review (Moravian University, 2015). The university dining department has initiated several sustainable practices to address food waste. It implemented the LeanPath tracking system, which reduced food waste by 40% by managing serving

sizes to prevent overpreparation of food items; solid food products are recycled using an onsite food pulper and composter; and cooking oil is recycled using an automated management system for reuse as biofuel and animal feed (Moravian University, n.d.-b). Sodexo employs an undergraduate student as a dining sustainability intern to work on food sustainability projects and food waste prevention campaigns. Although there have been systems-level interventions to address food waste on the MU campus, there is a need for changes at the individual level to reduce food waste, including changes in knowledge, attitude, and behavior.

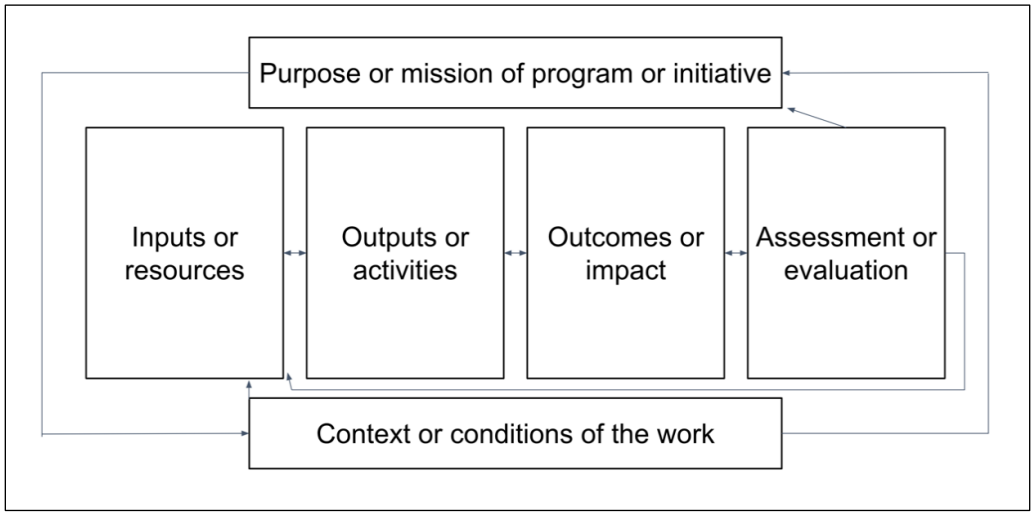
Logic Model Framework

A logic model is a visual map that describes a program's resources, activities, outputs, and outcomes (Centers for Disease Control and Prevention, 2018; Taylor-Powell & Henert, 2008) (Figure 1). Logic models are useful for program planning, implementation, and evaluation and have been an effective planning tool for collaborative committees (Payton et al., 2022). A logic model was developed for the New Visions Hunger Project in Ulster County, New York, to outline the problem statement, goal, resources, activities, output, and outcomes (Spratt, 2011). Creation of a logic model for Ka Ora, Ka Ako, a healthy school lunch program in New Zealand, identified strengths related to community impact and areas for improvement that warrant continued investment (Garton et al., 2023). FRN chapters have disseminated findings related to planning, implementing, and evaluating their work (Blankas, 2015; Dickinson et al., 2014; Losekamp, 2020; Schonberger, 2020; Schonberger et al., 2018; Sherwood, 2022). However, programs focused on food insecurity such as FRN chapters could benefit from the development of a logic model. A logic model is a tool for both short-term and long-term planning, which is valuable on a campus where undergraduate students spend an average of four years. A logic model guides students toward higher-impact activities that build on previous work, as opposed to repeating lower-impact activities every few years. It is beneficial to key stakeholders involved in sustainability work on the MU campus when students are knowledgable about the groups working on this issue, the previous activities that have been completed, and ways to scaffold work toward larger goals over time.

Logic Model Development

A draft logic model was developed by two faculty advisors and two student leaders of the MU FRN Chapter. Weekly meetings occurred over a semester to draft the logic model and further refine each section. Students met with employees at FRN, FRN chapter leaders at another university, and MU dining services to learn more about food waste on college campuses and to brainstorm ideas that would be feasible to reduce food waste on the MU campus. The logic model outlined the situation, priorities, inputs, outputs, outcomes, assumptions,

Figure 1. Example Logic Model Framework



Adapted from the Centers for Disease Control and Prevention Office of Policy, Performance, and Evaluation,

external factors, and evaluation plan for the FRN Chapter (Taylor-Powell & Henert, 2008).

Situation and Priorities

The situation describes the context; the epidemiology related to food insecurity and food waste, in addition to an overview of the FRN Chapter as a contributing solution, have been described in the Introduction portion of this paper and outlined in Table 1. The priorities were defined as the primary purpose of the FRN chapter. The MU FRN Chapter is part of the FRN, the largest student-led movement to reduce food waste and end hunger in the U.S. FRN's top priority is to engage students on campus in food recovery efforts as described in the public health logic model (Figure 2). Students participate in education activities on campus related to food waste, food insecurity, and sustainability. They partner with local organizations to collect and deliver excess food.

Assumptions and External Factors

Assumptions and external factors are an extension of the "conditions of the work" piece of a logic model framework. For the logic model framework to function as intended, it was assumed there will be adequate recruitment of student leaders and that responsibilities will transition effectively between outgoing and incoming leaders. Changes in the socioeconomic conditions of Lehigh Valley residents, as well as disasters, climate conditions, or other emergency events may affect the food needs of the population, and subsequently may require us to reevaluate our priorities, inputs, and outcomes. Assumptions and external factors are summarized in Table 2.

Inputs and Outputs

The inputs included the key people, committees, and resources for the MU FRN Chapter. The FRN Chapter is led by a faculty advisor and four student ambassadors including a president, vice president, treasurer, and secretary. They host chapter meetings and receive a budget from the university. The FRN Chapter has an Instagram account to share its work, an email address to communicate with members, and a Google Drive to store electronic files. The FRN provides marketing materials such as an FRN banner, sweatshirts, laptop stickers, and buttons. The MU dining services is a crucial partner that leads campus events and provides the opportunity for students to conduct events in the dining halls. Other key partners include the Public Health Club and other FRN chapters. The public health program has a dedicated space on campus where students can work on FRN projects and store FRN materials.

The outputs included the FRN Chapter activities and participation. The main activity outputs include regular FRN Chapter meetings, Instagram posts, Weigh the Waste events, food drives, and delivery of excess food to community organizations serving populations experiencing food insecurity. The FRN Chapter reaches other committees on campus, community partners, and professional networks that all work to support persons experiencing food insecurity (Figure 3). Mo's Cupboard and the Sustainability Committee are resources that

Table 1. Summary of the Situation and Priorities of the Moravian University (MU) Food Recovery Network (FRN) Logic Model

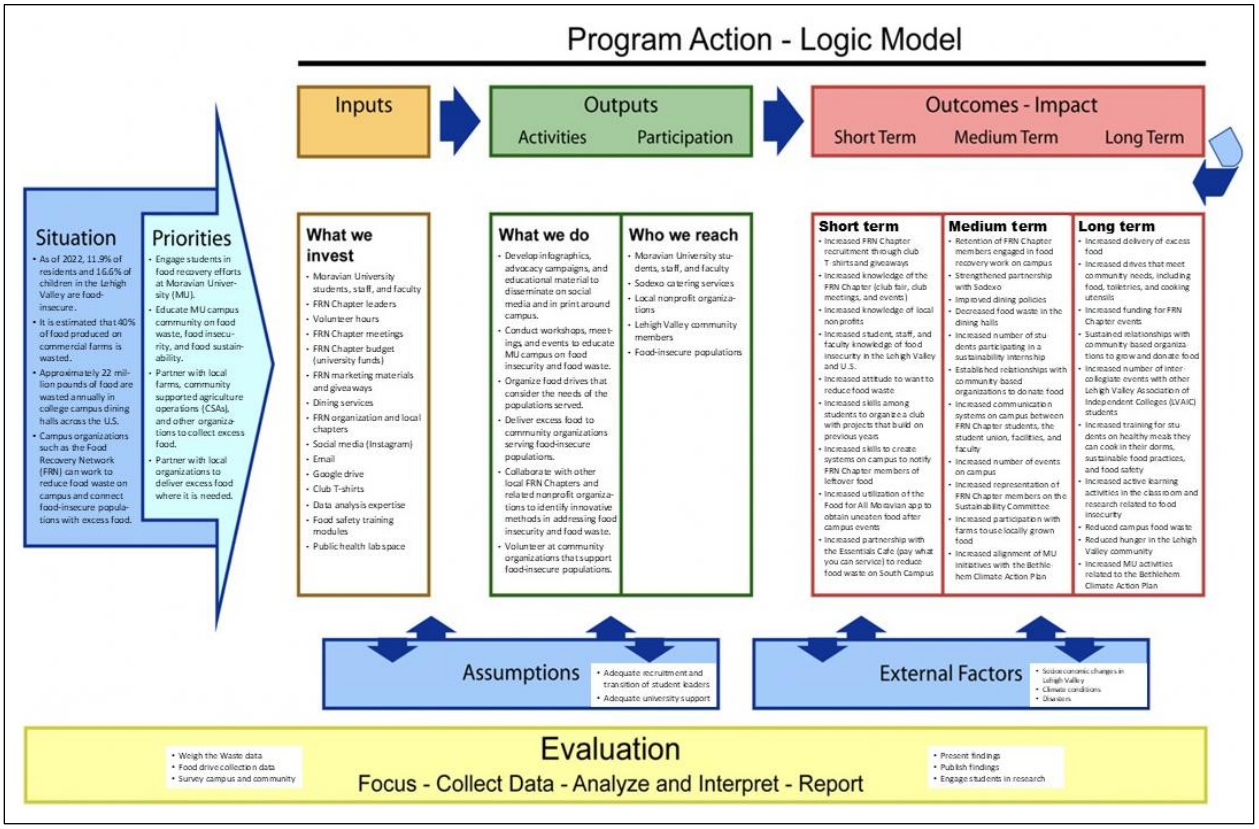
Situation	Priorities
As of 2021, 10.7% of residents and 15% of children in the Lehigh Valley are food-insecure.	Engage students in food recovery efforts at MU.
It is estimated that 40% of food produced on commercial farms is wasted.	Educate MU campus community on food waste, food insecurity, and food sustainability.
Approximately 22 million pounds of food are wasted annually in college campus dining halls across the U.S.	Partner with local farms, community-supported agriculture (CSAs), and other organizations to collect excess food.
Campus organizations such as the FRN can work to reduce food waste on campus and connect food-insecure populations with excess food.	Partner with local organizations to deliver excess food where it is needed.

address food insecurity among the student population. Campus dining has five locations through Sodexo including two dining halls, two cafes, and a convenience store; vending options and a food truck are also available. Public health faculty teach courses that provide students with related knowledge and skills, including courses on Sustainability from a Public Health Perspective, Environmental Health, Social Determinants of Health, Epidemiology, Essentials of Health Behavior, Nutrition, and Program Planning and Evaluation. Community partners include nonprofit organizations such as homeless shelters, food banks, local farms and community supported agriculture operations, and healthcare organizations. Inputs and outputs are summarized in Table 3.

Outcomes and Evaluation Plan

The outcomes were described including the short-term (1–3 year), medium-term (3–5 years), and long-term (5–10 years) outcomes. The main short-term outcomes include increased FRN Chapter recruitment, increased knowledge of food insecurity among those on campus, increased attitude to want to reduce food waste, increased skills among students to organize a club with projects that build

Figure 2. Logic Model for Planning the Food Recovery Network Chapter at Moravian University



Note: Logic model template derived from Taylor-Powell and Henert (2008).

Table 2. Summary of Assumptions and External Factors of the Moravian University (MU) Food Recovery Network (FRN) Logic Model

Assumptions	External Factors
Adequate recruitment and transition of student leaders	Socioeconomic changes in the Lehigh Valley
Adequate funding and support from MU	Climate conditions and disasters

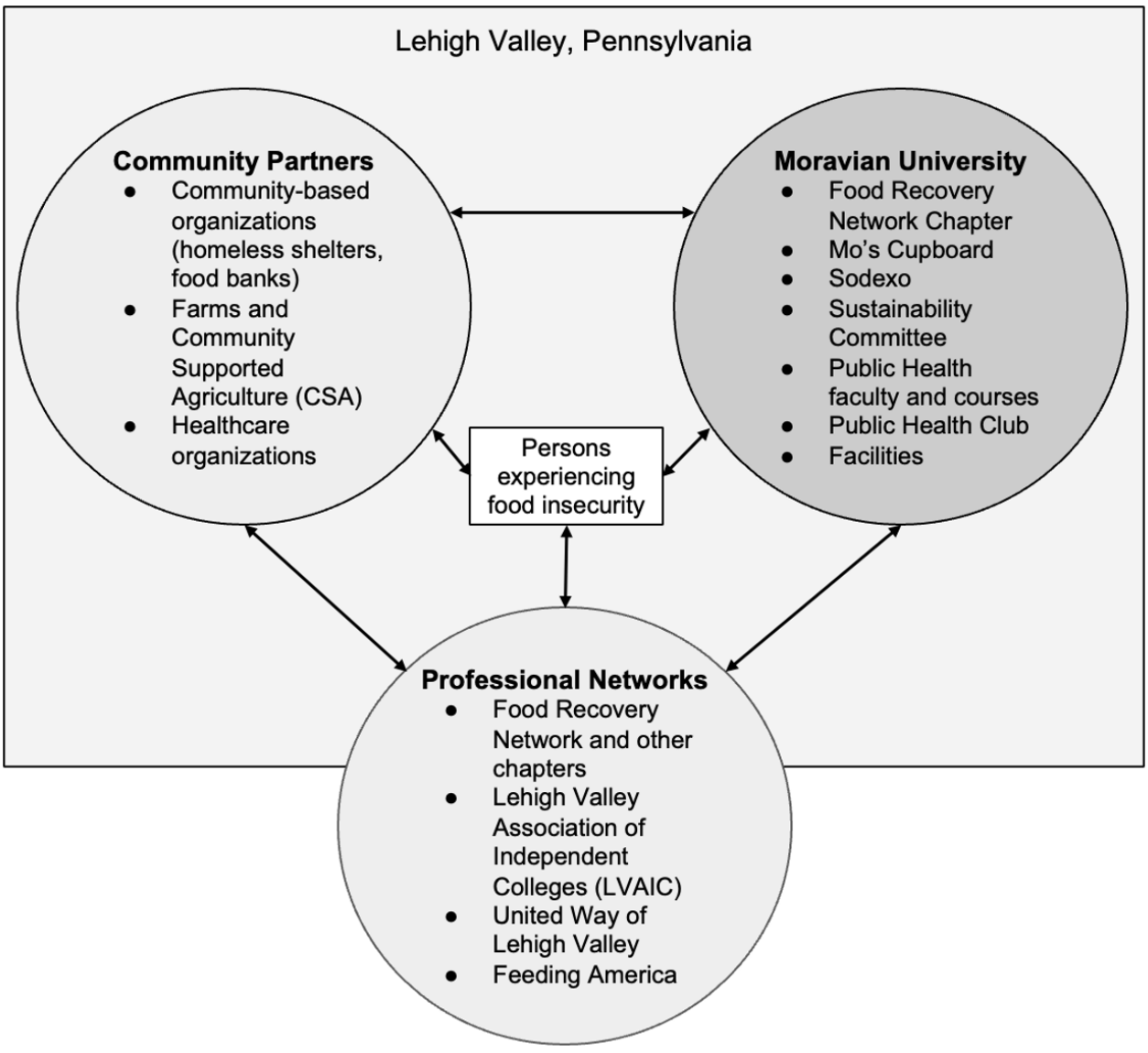
on previous years, and increased skills to create systems on campus to notify FRN Chapter members of leftover food. The main long-term outcomes include decreased food waste on campus, increased food drives that meet community needs, increased delivery of donated food to local populations experiencing food insecurity, increased events on campus related to sustainable food practices, and sustained partnerships with stakeholders on campus, at other LVAIC schools, and in the Bethlehem community.

The activities of the MU FRN Chapter will continue to be evaluated through the collection and analysis of data, including campus events (Weigh the Waste, food drives) and campus and community surveys. These findings will be shared with the community through oral presentations and publications. A periodic review and update of the logic model will also be conducted. Outcomes and evaluation are summarized in Table 4.

Implementation

Two activities were planned and implemented in the first year to address short-term goals of the

Figure 3. Organizational Map of Key Stakeholders for the Moravian University (MU) Food Recovery Network (FRN) Chapter



chapter. These activities–Weigh the Waste and food donation drives—have continued into the third year since the chapter's founding. Data collected from these events will be used to evaluate inform the medium- and long-term goals of the chapter.

Case Study #1: Weigh the Waste

At total of four Weigh the Waste events were conducted between January 2022 and February 2023 to measure food and beverage waste that diners did not eat during a meal period in a campus dining hall. Communication with the dining vendor, Sodexo, was required to implement this event. A four-hour block was reserved for either lunch (11:00 am–3:00 pm) or dinner (4:30–8:30 pm). A sign-up sheet was created for three to five volunteers to sign up for a 30-minute to one-hour time slot. Student volunteers were recruited in public health classes and through clubs on campus. Some courses offered extra credit for volunteering.

A safety email was sent out before the event (see the Appendix). Volunteers were given personal protective equipment (gloves, aprons, and shoe slipcovers) and collection equipment (slotted and unslotted scraping spoons and separate plastic basins for solid food waste and paper products, liquid waste, and plastic utensils). Plates were collected from diners and waste deposited in their respective basins. If there was a substantial amount

Table 3. Summary of the Inputs and Outputs of the Moravian University (MU) Food Recovery Network (FRN) Logic Model

Inputs	Outputs	
	Activities	Participation
MU students, staff, and faculty	Develop infographics, advocacy campaigns, and educational material to be disseminated on social media and in print around campus	MU students, staff, and faculty
FRN Chapter leaders	Conduct workshops, meetings, and events to educate MU campus on food insecurity and to change behavior to reduce food waste such as Weigh the Waste events	Sodexo catering services
FRN organizations and local chapters	Organize food drives that consider the needs of the populations served	Local nonprofit organizations
Volunteer hours	Deliver excess food to community organizations serving food-insecure populations	Lehigh Valley community members
FRN Chapter meetings	Collaborate with other local FRN chapters and related nonprofit organizations to identify innovative methods in addressing food insecurity and food waste	Food-insecure populations
FRN Chapter budget (university funds)	Volunteer at community organizations that support food-insecure populations	
FRN marketing materials, T-shirts, and giveaways		
MU Dining services		
Social media		
Email and cloud storage		
Data analysis expertise		
Food safety training modules		
Public Health lab space		

of food left on a utensil, it was first scraped into the solid waste basin before being deposited into the utensil basin. Plastic utensils were used during three of the four Weigh the Waste events due to existing pandemic precautions before the dining halls transitioned back to reusable metal utensils.

The contents of each basin were weighed using a digital food scale. Measurements were taken in ounces and converted to pounds. Extrapolations of waste were calculated assuming three meals per

Table 4. Summary of Outcomes and Evaluation Plan of the Moravian University (MU) Food Recovery Network (FRN) Logic Model

Outcomes			
Short-Term	**Medium-Term**	**Long-Term**	**Evaluation Plan**
Increased FRN Chapter recruitment through club T-shirts and giveaways as measured by the active club email list, member participation, and social media engagement	Retain FRN Chapter members engaged in food recovery work on campus	Increased delivery of excess food to students on campus and nonprofit organizations	Weigh the Waste data over multiple semesters to determine magnitude and changes in dining hall food waste
Increased knowledge of the FRN Chapter (club fair, club meetings, and events)	Strengthened partnership with Sodexo as measured by increased collaborative events	Increased drives that meet community needs including food, toiletries, and cooking utensils	Food drive data to evaluate amount and type of items donated
Increased knowledge of local nonprofits focused on addressing food insecurity	Improved dining policies	Increased funding for FRN Chapter events	Campus surveys to evaluate food attitudes, behaviors, and values
Increased student, staff, and faculty knowledge of food insecurity in the Lehigh Valley and U.S. after campus events and social media posts	Increased number of students participating in a sustainability internship	Sustained relationships with community-based organizations to grow and donate food	Community surveys to determine needs and inform food drive collection practices
Increased attitude to want to reduce food waste as measured by surveys before and after Weigh the Waste events	Decreased food and beverage waste in the dining halls over time as measured through Weigh the Waste events	Increased number of intercollegiate events with other LVAIC students	Dissemination of data and analyses
Increased skills among students to organize a club with projects that build on previous years as measured by an end of the year summary report	Established relationships with community-based organizations to donate food	Increased training for students on sustainable food practices and food safety	Mentor at least one student poster presentation or oral paper at a conference or meeting per academic year
Increased skills to create systems on campus to notify FRN Chapter members of leftover food	Increased number of events on campus (food drive, Weigh the Waste)	Increased active learning activities in the classroom and research related to food insecurity and waste	Identification of and contact with one new community partner per academic year
Increased utilization of the Food for All MU app to obtain uneaten food after campus events	Increased communication systems on campus between FRN Chapter students, the student union (HUB) desk, facilities, and faculty	Engagement of students in research process and presentation	Maintain at least one food sustainability activity in the following courses: Introduction to Public Health, Environmental Health, Sustainability in Public Health, and Social Determinants of Health
Increased partnership with the Essentials Cafe (pay what you can service) to reduce food waste on south campus	Increased representation of FRN Chapter members on the Sustainability Committee	Reduced hunger in the Lehigh Valley community as measured by community needs assessments	Ongoing evaluation of food security data at MU and in Lehigh Valley on a biyearly basis
	Increased participation with local farms to use grown food	Reduced food waste in the MU campus community	
	Increased alignment of MU initiatives with the Bethlehem Climate Action Plan	Increased MU activities related to the Bethlehem Climate Action Plan	

day, seven days per week, 16 weeks per semester, and two semesters of a fall and spring academic year. Data are summarized in Table 5. During four meal periods, 529.42 lbs. (240 kg) of food waste and 296.35 lbs. (134 kg) of beverage waste were collected from 1,555 diners (see Table 1). On average, there were approximately 1.61 lbs. (0.73 kg) of food (solid and liquid) waste per person per day, which amounts to approximately 361 lbs. (164 kg) of food waste per person over the course of an academic year (two semesters consisting of 16 weeks).

Case Study #2: Food Drive

A campuswide food drive was conducted in October 2021. Donations were categorized by the team name of the donor (examples: public health courses, volleyball team, Zeta Tau Alpha). The team with the most donations won a pizza party. Some public health courses offered extra credit for students to donate items. Food items were collected daily in multiple locations on campus. Items were counted and tracked in a spreadsheet. Donations of 1,618 items, weighing 548 lbs. (249 kg), of non-perishable food, toiletries, and cleaning supplies were collected during the four-week food drive and delivered to New Bethany. This nonprofit organization, located on the southside of Bethlehem, provides food and hygiene assistance, short-term housing, and employment assistance for the Lehigh Valley community (New Bethany, n.d.). New Bethany was selected for this donation drive due to previous collaborations with Moravian University's Public Health Program and a shared mission toward addressing food insecurity in the Bethlehem area.

Ethical Considerations

The MU Institutional Review Board (IRB) reviewed these projects and determined they were exempt from IRB approval.

Discussion

College campuses can serve as a smaller-scale model to gain an understanding of attitudes and behaviors related to food waste and food insecurity and to foster participation in sustainability initiatives (Evans & Roggio, 2023). The MU FRN Chapter found it valuable to develop a logic model to initiate activities and for the sustainability of the university student group over time. Strengths of the FRN Chapter's work to date include the use of

Table 5. Food and Beverage Waste During Four Meal Periods in the Campus Dining Hall Measured as Part of Weigh the Waste Events led by the Moravian University Food Recovery Network Chapter

	February 16, 2022	April 20, 2022	November 14, 2022	February 15, 2023	
Students residing on campus (number)	972	972	968	968	
Meal period	**Dinner**	**Dinner**	**Lunch**	**Lunch**	**Total**
Number of diners during each meal period	327	366	460	402	1,555
Plastic utensil waste (lbs.)[a]	34.10	32.80	21.00	N/A	87.90
Food waste (lbs.)	131.20	138.80	145.79	113.63	529.42
Beverage waste (lbs.)	64.59	76.22	71.83	83.71	296.35
Food and beverage waste per person (lbs.)	0.60	0.59	0.47	0.49	0.53
Estimated food and beverage waste per person, per day (lbs.)	1.80	1.76	1.42	1.47	1.61
Estimated food and beverage waste per person, per week (lbs.)	12.57	12.34	9.93	10.31	11.29
Estimated food and beverage waste per person, per semester (lbs.)	201.18	197.40	158.96	164.94	180.62
Estimated food and beverage waste per person, per academic year (lbs.)	402.36	394.79	317.91	329.88	361.24

[a] Plastic utensils were temporary and no longer used in Moravian University dining halls beginning in January 2023.

social media to highlight FRN events and recruit additional students, the partnership with Sodexo to plan events and new initiatives, student participation in Weigh the Waste events and food drives, and the partnership with Mo's Cupboard to donate food. Challenges of the FRN Chapter's work to date include maintaining continuity of activities as students graduate, scheduling regular meetings with students to plan events, and fluctuating student participation and interests over time. Another challenge includes maintaining the email list and the cap on the maximum number of emails that can be sent by the Food for All app. Future directions include reviewing the logic model on an annual basis and increasing the quality and quantity of partnerships with community-based organizations and groups on campus such as the Sustainability Committee, faculty members, and other student clubs like Eco Club. Student-led food recovery organizations at other universities may find this model useful for program planning, especially those who are in the early stages of planning or are attempting to revitalize existing programs. Due to the transient nature of students, time is a critical element in the success of an organization. A logic model framework such as the one discussed here can support students in maintaining initiatives on their campus between academic years and through leadership changes. This framework also provides students with clear goals and plans, so they can utilize their time efficiently.

Case Study: Weigh the Waste

Weigh the Waste events have been successful in gathering information on food waste at MU. Similar lunchroom food waste evaluation efforts have been conducted at secondary and post-secondary institutions and can serve as a future model for FRN Chapter activities(Ellison, et al. 2019). Starting in spring 2023, the Star Dining Hall no longer utilized plastic eating utensils. Additional strengths include increasing knowledge of food waste through the creation of infographics and other marketing material, and student engagement in sustainability projects on campus. A key factor in the success of these events is recruiting student volunteers; working with faculty to offer extra credit served as an effective recruitment tool. The success and expansion of food waste evaluation will rely on adequate recruitment of student volunteers and effective planning and communication between the FRN Chapter and Sodexo. Future work will include conducting a Weigh the Waste event at MU's south campus dining hall. The chapter also plans to conduct a survey of students, faculty, and staff to measure the knowledge, attitude, and behaviors related to food insecurity and food waste (Alattar et al., 2020). This survey project will precede a social media outreach campaign followed by Weigh the Waste event to evaluate any changes in attitudes and behaviors.

Case Study: Food Drive

The FRN Chapter food drive was successful in collecting items for donation to New Bethany. Promoting the event at the department and school level and creating a competition between majors, departments, and student organizations assisted in receiving adequate donations. Recruitment of student volunteers and participants, as well as sufficient promotion of the food drive, remain potential barriers to future success of these events. Future food drives will include the collection of measuring cups and spoons, spatulas, can openers, and other food-related items in addition to nonperishable food and toiletries as community-based organizations expressed this need (Verpy et al., 2003). A future goal to enhance the value of the food drive will involve a community needs assessment to gain insight into most-needed items.

Limitations

Although the development of a logic model was useful for the MU FRN Chapter, it had limitations. The logic model may be modified over time as the goals and resources of the FRN Chapter evolve. Implementation and evaluation of the logic model are dependent on FRN Chapter student leaders, who may have differing levels of participation over time. Identifying and connecting with key stakeholders is still in the early stages and will continue to develop and strengthen over time. Since each Weigh the Waste event was conducted at the dining hall for only four-hour increments, data might not be reflective of the actual eating patterns of dining hall patrons over the course of an entire day.

Additionally, data were not collected on the type of food offered during each event, which may contribute to food waste volume. Reductions in food waste in the cafeteria do not necessarily translate to increased food access. Limitations to the food drive include a need to categorize the food, toiletries, and cleaning supplies donated and to determine if this matches the needs of the community.

Conclusions

The FRN Chapter at MU was established to address food waste and food insecurity. The logic model provides FRN Chapter leaders with a road map of detailed activities and related outcomes that can guide transitions as students graduate and new students are recruited. The FRN Chapter has recruited new student members, implemented Weigh the Waste and food drive events, and educated the campus community via social media in efforts to reach short-term outcomes. In the future, the FRN Chapter will continue to implement and evaluate planned activities and collaborations to reduce food waste on campus and to decrease hunger among students and in the local community. This research brief may be useful for students or college organizations who are in the early stages of designing or implementing a food recovery program at their institution.

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Appendix

Email Sent to Student Volunteers for Weigh the Waste Events

A quick reminder that this Wednesday, February 16th, we are hosting Moravian University's first Weigh the Waste event! Below are the safety expectations for the event.

1. Wear flat, sturdy shoes that cover your entire foot. No open-toed shoes or sandals.
2. Wear comfortable clothing such as long pants and a T-shirt.
3. Bring/wear a hat. Hair will need to be put up if it is long.
4. Don't wear any hand/wrist jewelry.
5. All participants will be provided with an apron, gloves, and shoe slipcovers if you would like them.