

Food Waste Study in the HORECA Sector

in Vientiane and Vang Vieng, Lao PDR

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1. Executive Summary

Food waste amounts

Spoilage analysis shows minimal food waste in most businesses, but data gaps raise concerns. The majority of food waste is concentrated in preparation and plate/buffet stages. Hotels generate significantly less plate waste compared to buffet waste. Restaurants consistently demonstrate better food waste outcomes than cafés and hotels, suggesting their core business model plays a crucial role in effective waste management. The majority of food waste appears to concentrate in the preparation and plate/buffet stages.

A minority of businesses generate up to 2kg per customer, requiring particular attention. 88% of the businesses exceed the 80g per customer benchmark, highlighting the need for collective action and effective waste management strategies. In Vang Vieng, businesses achieved an average 40% reduction in food waste generation through Swisscontact activities.

Food waste costs

The study estimates that over 30% of businesses can save up to 10,000 kip per customer if they reduce waste. The median food waste cost is around 7,000 kip per customer for restaurants and cafés, and up to 8,000 kip for hotels.

Addressing food waste presents a clear financial opportunity for two key groups:

- ❖ High-volume businesses: With a large customer base, even small reductions in waste can yield significant cost savings.
- ❖ Businesses with high waste costs: Our estimations show that some businesses reached very high food waste costs, up to 48,000 kip per customer. They would benefit greatly from waste reduction initiatives.

Current food waste monitoring

Food waste data collection is often neglected and remains a significant gap. The survey revealed that waste management in businesses is not well-understood, with only 30% of businesses implementing food waste monitoring, and only 14% of buffets employing dedicated monitoring, with the most common practice being counting waste bags. More comprehensive practices, such as measuring food waste at different stages, assessing customer satisfaction, and recording orders, are not reported.

Current food waste management practices

Only a minority of businesses actively take steps to minimize their food waste. Businesses surveyed distribute leftover food to staff, reducing waste and benefiting employees.

The majority of businesses focus on separating food waste from other types and using it as animal feed, but there is room for improvement by implementing more comprehensive and impactful practices. However, over 70% of businesses employ at least one separation measure, demonstrating good intentions towards waste management practices. Recycling food waste practiced by the studied businesses include staff consumption, animal feed donation. Innovative practices like biogas generation are still rare.

Only a small percentage of customers are actively informed about it during their dining experiences. This highlights the need for customer education in waste reduction programs, as 75% of businesses do not communicate on the topic and never considered it.

Knowledge, skills and attitude

The study revealed a disconnect between actual waste levels and self-assessment suggests a lack of awareness. Accordingly, 100% of HORECA businesses have not received support outside of Swisscontact activities to improve their food waste management. This is due to a significant gap in training and capacity-building resources. Despite some support from Swisscontact, most businesses have not benefited from comprehensive food waste audits or in-house training programs, and the research team found no such services readily available within Laos. The majority of respondents emphasized the need for staff training in these areas.

A positive reception was found among businesses, with 96% expressing interest in tackling the issue. 73% businesses would consider adjusting their menus to reduce food waste, focusing on cost savings and customer satisfaction. In addition, 66% businesses would consider adjusting ingredients in their dishes.

The survey revealed that businesses recognize the benefits of improving food waste management practices, including environmental responsibility, cost savings, improved sanitation, reduced odor, and animal feed for livestock raising staff. Half of the businesses interviewed are considering implementing measures to reduce food waste, with a majority willing to allocate dedicated staff time. However, they also express concerns about the financial burden and the need for specialized equipment.

Recommendations

HORECA businesses can dramatically cut food waste.

First, businesses need a clear picture of their food waste. Tracking it at every stage – spoilage, prep, buffets, and plates – reveals areas for improvement. Armed with this knowledge, businesses can tailor solutions. They can communicate their commitment to sustainability, offer discounts on expiring food, and create special menus featuring near-expiration ingredients. Partnering with local farmers for seasonal produce and embracing “ugly” vegetables reduces waste further. Training chefs on repurposing leftovers and minimizing prep waste is key. Dedicated bins with clear signage encourage proper disposal, while leftover food can be used in animal feed programs, converted to biogas, composted, or vermicomposted.

In-house training programs to empower management and staff with the knowledge and skills to minimize waste efficiently would be key in the context unveiled by this study.

These steps not only reduce environmental impact but also save money. Furthermore, leadership strategies to foster collaboration with farmers, public awareness campaigns, and in-house training programs to equip staff with the knowledge and skills to minimize food waste across the entire supply chain. Innovative ideas like a discounted unsold food app and mutually beneficial contracts with local farmers could provide additional benefits.

2. Introduction

Food Waste in the Lao PDR's HORECA Sector: Challenges and Opportunities

Food waste is a pressing global issue, with a significant environmental and economic impact. According to the United Nations Environment Programme (UNEP), an estimated 931 million tons of food waste were generated in 2019, with the food service sector contributing a substantial 26% of this figure. This wasted food decomposes in landfills, releasing methane, and is estimated to be responsible for 8-10% of global greenhouse gas emissions.¹

In the Lao PDR, food waste presents a particular challenge, especially in urban areas. Observations by the Waste to Value project indicate that over 30% of these areas lack proper food waste separation practices. A recent study by the Global Green Growth Institute (GGGI) reveals that organic waste makes up a staggering 56% of city landfill waste, with 44.3% of that specifically being food waste.² While food waste in developing countries is often studied within the context of sustainable agriculture and environmental management, the hospitality sector (HORECA: Hotels, Restaurants, Cafes) also represents a significant contributor.

However, limited research exists globally on the the topic of food waste within the HORECA sector. This knowledge gap is particularly acute in Lao PDR.

Addressing the Knowledge Gap: The Swisscontact Study

To address this critical knowledge gap and contribute to the success of the Waste to Value project's interventions, Swisscontact commissioned a study to investigate food waste generation and management practices within the HORECA sector of the project's target districts: Chanthabouly and Xaysettha districts in Vientiane Capital, and Vangvieng district in Vientiane Province.

This report presents the findings of that study. It aims to:

- Quantify food waste generation within the HORECA sector of the target districts.
- Identify key areas where food waste occurs throughout the food supply chain.
- Evaluate current practices for food waste separation, repurposing, and disposal.
- Assess the knowledge, skills, and attitudes of HORECA staff regarding food waste management.
- Develop practical recommendations for HORECA businesses to minimize food waste and improve their food waste management practices.

By providing a comprehensive understanding of food waste within the Lao PDR's HORECA sector, this report aims to empower stakeholders with the knowledge and tools needed to implement effective food waste reduction strategies. These strategies will not only benefit the environment by reducing greenhouse gas emissions but also contribute to lower costs for HORECA businesses.

¹ United Nations Environment Programme (2021). Food Waste Index Report 2021. Nairobi

² VCOMS - Vientiane City Office for Management and Service (2022): Sustainable solid waste management strategy and action plan von Vientiane 2021-2030. Vientiane

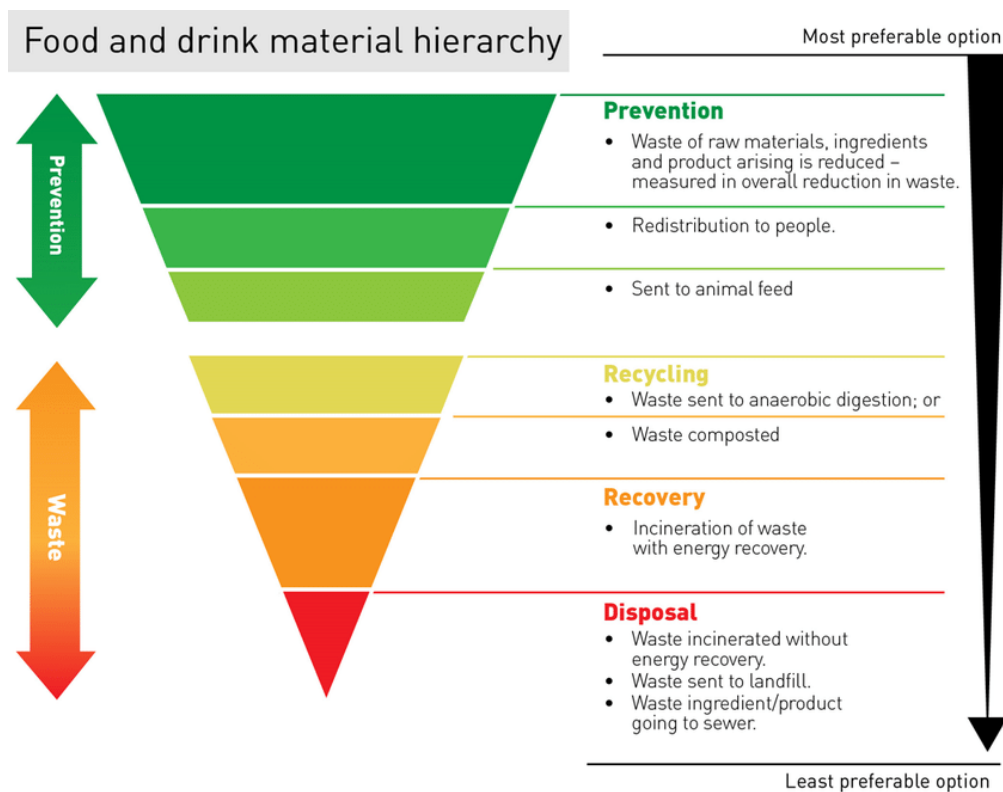
3. Methodology

Conceptual framework

The UK Food Waste Hierarchy³ provides a valuable framework for tackling food waste efficiently in the HORECA sector. Here's a breakdown of the key steps:

- **Prevent Surplus and Waste:** This should be your top priority. Strategies include accurate menu planning, efficient inventory management, and portion control.
- **Redistribute Surplus Food and Drink:** Donate edible food to charities or partner with food banks.
- **Repurpose Food Scraps:** Explore options like converting leftover food into animal feed or biomaterials.
- **Recycle Food Waste:** Implement composting or anaerobic digestion programs to divert food scraps from landfills.
- **Recover Energy:** If the above options are not feasible, consider converting food waste into energy through specialized processes.
- **Disposal as Last Resort:** Disposing of food waste in landfills should be the absolute last option due to its environmental impact.

The diagram below highlights a key principle: tackling food waste early in the process is the most efficient strategy.



³<https://www.gov.uk/government/publications/food-and-drink-waste-hierarchy-deal-with-surplus-and-waste/food-and-drink-waste-hierarchy-deal-with-surplus-and-waste>

Aligned with these principles, this study explores all stages of food waste management in the HORECA sector, encompassing prevention, optimization, recycling, and potential recovery options.

Therefore, our conclusions will focus on food waste in different stages:

- Spoilage: Food waste occurring at the pre-kitchen level, before the products are cooked
- Preparation: Food waste occurring during the preparation of the dishes
- Buffet: Food waste remaining at the end of a buffet
- Plate: Food waste remaining at the end of plate dishes

Our study ranges the full HORECA sector, including Hotels Restaurants and Cafés, with businesses categorizing into small (less than 19 employees), medium (from 19 to 99 employees) and large (above 99 employees) as per the official categorization⁴.

Objectives

This study aims to understand food waste constraints in the HORECA sector in Lao PDR, focusing on challenges in classifying, quantifying, and characterizing hospitality food waste. Key objectives include defining types and quantities of food waste, identifying key areas of operations, reducing waste quantities, discussing innovative solutions for food waste recycling or energy recovery, and providing recommendations for food waste reduction, recycling, and recovery. The study focuses on food waste in different stages generated in the HORECA sector, targeting businesses in Chanthabuly and Xaysetha districts in Vientiane Capital and Vang Vieng district in Vientiane Province. The study will be guided by the following research questions:

1. Characterizing Food Waste:

- What types and quantities of food waste are generated across HORECA operations (spoilage, preparation, buffet, plate) for different business sizes (SME)?
- What are the leading causes and associated costs of food waste in each area?
- How is food waste currently managed across operations?

2. Food Waste Reduction Strategies:

- How can food waste be reduced in procurement, storage, preparation, and disposal?
- What potential cost savings and environmental benefits (CO2 reduction) can be achieved through reduction strategies?
- Who needs to be involved (management, staff, customers) to implement these strategies?

3. Food Waste Recycling and Recovery:

- What on-site recycling/recovery options exist for different food waste types (composting, anaerobic digestion)?
- What off-site options are available for recycling or energy recovery?
- What are the economic and environmental impacts of these solutions?

⁴ <https://lncci.la/smes/>

4. Recommendations for Lao PDR:

- What recommendations for food waste reduction, recycling, and recovery are most appropriate for the Lao PDR context?
- What pre-conditions and support are needed to pilot these recommendations across different HORECA business sizes?

Businesses sample

The study focuses on HORECA businesses, namely hotels, restaurants and cafés. The following tables show the variety of sizes of the businesses interviewed during this study for each category:

Customers per day	Restaurant	Café	Hotel
Min	9	7	9
Average	88	33	40
Median	50	28	23
Max	567	118	231

Number of staff	Hotel	Restaurant	Café
Max	140	43	21
Average	37	16	8
Min	9	3	2

Surveys, interviews & data collection process description

Quantitative study

Between October and December 2023, the project team conducted semi-structured interviews with managers or representatives from a selection of HORECA establishments. These interviews served two key purposes: firstly, to gather valuable background information on the participants' businesses, their experience with food waste management, and their current practices.

In parallel, the team measured food waste for an entire week in each business participating in the HORECA interviews.

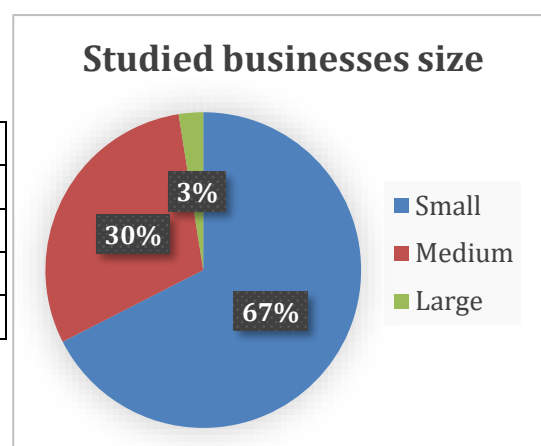
The following tables presents the number of businesses taking part in the quantitative survey per category.

Interviewed businesses per location:

HORECA	Chanthabouly	Saysettha	Total
Hotel	10	2	12
Restaurant	10	8	18
Café	4	6	10
Grand total			40

Interviewed businesses per size:

	Small	Medium	Large
Hotel	5	6	1
Restaurant	13	5	0
Café	9	1	0
Total	27	12	1



Furthermore, the data collected by Swisscontact in its food waste reduction activities in Vang Vieng was shared with the consultants and is used in this study to provide additional quantitative information.

Qualitative study

The research employed a qualitative survey of HORECA businesses in two Vientiane districts, ensuring balanced representation from both provinces. This was complemented by 15 in-depth interviews with HORECA businesses and 6 interviews with key stakeholders: Lao Biogas, the Lao Hotel and Restauration Association (LHRA), GGGI, the Lao Farmers Group, UDAA Vang Vieng, and VCOMS Findings from these qualitative assessments will strengthen the survey results and help answer the research questions.

4. Study Key Findings

4.1. Food Waste Amounts

Literature research & food waste amount reference

Our investigation into average restaurant food waste per customer in grams yielded limited results, especially concerning Southeast Asia. To address this data gap, we utilized the following sources, which offered relevant data for our analysis.

Amounts of food waste per customer internationally

The study “Consumer’s food waste in different restaurants configuration: A comparison between different levels of incentive and interaction”⁵ summarizes the results from various studies on food waste in the restauration sector: “Some recent investigations give some information related to food waste in food service. For example, in a study conducted in China in 2018, Wu et al. (2019) found 73.7 g/cap/meal of wasted food in 2018; Ellison et al. (2019) found 69.59 and 84.77 g of waste per consumer in USA; and Eriksson et al. (2017) found an average of 75 g of food waste per plate served in Swedish public catering services; Wang et al. (2017) analysed 3557 tables in 195 restaurants in China. They found 93 g of food waste per capita per meal.”

The study “Quantifying Food Waste in the Hospitality Sector and Exploring Its Underlying Reasons—A Case Study of Lahore, Pakistan” provides similar results in Pakistan:

“Waste per customer was found to be 79.9 g (survey) and 73.4 g (live tracking) for restaurants, 138.4 g for hotels and 140.0 g for caterers.”⁶

Amounts of food waste per customer in Vang Vieng

Additionally, Swisscontact developed a food waste reduction training and monitoring tool to assist hotels and restaurants in Vang Vieng in addressing and reducing their food waste. This initiative resulted in a significant reduction in food waste per customer, from an initial level of 177g/customer to 80g/customer after a four-month intervention period.

Concordantly with findings from similar studies in other countries, Swisscontact's program in Vang Vieng demonstrated average food waste per customer levels consistent with the broader global context. Accordingly, the program's final average value served as a reference point for evaluating the food waste levels observed in this study, with 80g/customer.

⁵ Source: <https://www.sciencedirect.com/science/article/pii/S0956053X20303809#b0250>

⁶ Source: <https://www.mdpi.com/2071-1050/14/11/6914>

Measured food waste amounts per customer

To serve as a reference, our analysis of literature and Swisscontact's follow-up with hotels and restaurants suggests that a realistic target for total food waste per customer is 80g/customer.

The following tables present the amounts of food waste per customer measured during our quantitative survey at all four stages:

Spoilage (g/customer)	Restaurant	Café	Hotel
Min	0	6	5
Average	1	32	36
Median	1	22	17
Max	2	68	105

Preparation (g/customer)	Restaurant	Café	Hotel
Min	16	39	27
Average	94	158	297
Median	86	129	190
Max	205	436	1,243

Buffet (g/customer)	Restaurant	Café	Hotel
Min	59	-	23
Average	90	-	225
Median	90	-	147
Max	120	-	910

Plate (g/customer)	Restaurant	Café	Hotel
Min	6	30	45
Average	112	136	95
Median	103	91	95
Max	363	453	144

Spoilage

The survey results suggest very low spoilage rates among the businesses interviewed. However, this result should be taken cautiously, as only 9 out of 40 businesses provided answers for this section. Nevertheless, all restaurants demonstrated commendable performance in terms of spoilage waste. Among cafés and hotels, most showed good results, but one café and one hotel showed significantly higher spoilage waste.

Preparation

At the preparation stage, a majority of businesses generated more food waste than the target of 80g/customer. Restaurants showed notably better performance than cafés, while hotels recorded the highest overall waste levels. The maximum values observed warrant high action for the respective businesses. Nevertheless, it is crucial to acknowledge that certain food waste is inherent, especially in terms of fruit or vegetable peels, or seafood shells contribute significantly. Our data, however, does not differentiate between unavoidable and avoidable food waste, potentially inflating the overall estimates.

Buffet

The overall food waste levels observed at the buffet stage only across a majority of businesses exceeded the target of 80g per customer. While restaurants displayed generally moderate results, hotels showed significantly higher values, with a maximum amount recorded reaching 910g per customer, a dramatically high food waste amount.

Plate

While most businesses reported moderately high food waste levels, consistent with industry averages, some cafés and restaurants displayed a significantly higher waste generation.

Total amounts per customer

The following tables present the total amounts of food waste per customer in the businesses interviewed, including either the spoilage, preparation and buffet stages (Total Buffet), or the spoilage, preparation and plate stages (Total Plate). All of the businesses in which the measurements were performed were categorized either as a providing buffets or plates, so that there the following data is free from double counting.

Total Buffet (g/customer)	Restaurant	Café	Hotel
Min	148	-	152
Average	218	-	571
Median	218	-	376
Max	288	-	2,153

Total Plate (g/customer)	Restaurant	Café	Hotel
Min	22	69	79
Average	202	304	217
Median	195	199	217
Max	502	889	355

Hotel buffets generate noticeably more food waste than plate service, highlighting a key area for improvement within the hospitality industry. Restaurants, on the other hand, show minimal difference between buffet and plate waste. A concerning minority of businesses, generating up to 2kg per customer, stand out as extreme outliers requiring high attention.

Restaurants and hotels with plate service display a relatively even distribution of waste results, as evidenced by similar average and median values. However, a skewed distribution emerges for cafés and hotels with buffets. While the average waste is significantly higher, the median is closer to the lower end, indicating a few high-wasting businesses significantly influencing the overall average.

Our findings reveal significant potential for waste reduction. Setting a benchmark of 80g per customer, a considerable 88% (35 out of 40) of businesses exceed this limit. This underscores the urgent need for collective action and effective waste management strategies across all business types.

Total amounts per day

The following tables present the total amounts of waste generated per day measured during our quantitative survey:

Total Buffet (g)	Restaurant	Café	Hotel
Min	751	700	493
Average	9,263	3,075	15,035
Median	4,299	2,727	7,266
Max	80,770	5,536	84,203

Total Plate (g)	Restaurant	Café	Hotel
Min	1,573	1,570	1,173
Average	13,346	5,371	8,864
Median	7,449	5,848	4,648
Max	63,551	8,652	41,972

Total Buffet (Spoilage+Prep+Buffet) (g)	Small	Medium	Large
Min	493	1,131	84,203
Average	3,302	17,046	84,203
Median	2,776	9,495	84,203
Max	7,328	80,770	84,203

Total Buffet (Spoilage+Prep+Buffet) (g)	Small	Medium	Large
Min	493	1,131	84,203
Average	3,302	17,046	84,203
Median	2,776	9,495	84,203
Max	7,328	80,770	84,203

Several businesses emerged from the analysis with notably high total food waste, positioning them as prime candidates for biogas projects or alternative waste treatment solutions. The solution of biogas is presented in the recommendations section of this report.

Corresponding potential CO₂e emissions savings

The study “Assessing the climate change mitigation potential from food waste composting” finds the following emission factor for dry food waste 926 kgCO₂e/tonne.⁷ In other words, 1 tonne of dry food waste results in 0.926 tonne of CO₂ equivalent released in the atmosphere.

Assuming that the ratio dry food/wet food is 30%, it is possible to assess the amount of CO₂ equivalent emissions resulting from the amounts of food waste measured in our study by multiplying the amounts of food waste with this ratio and with the above emission factor. The following table presents the results of this calculation:

CO₂e tonnes emissions per business per year Total Buffet	Restaurant	Café	Hotel
Min	0.07	0.07	0.05
Average	0.92	0.30	1.49
Median	0.43	0.27	0.72
Max	7.99	0.55	8.33

CO₂e tonnes emissions per business per year Total Plate	Restaurant	Café	Hotel
Min	0.16	0.16	0.12
Average	1.32	0.53	0.88
Median	0.74	0.58	0.46
Max	6.29	0.86	4.15

The above amounts of CO₂e emissions through food waste reduction are mostly very low. Only the maximum values reach noticeable emissions amounts, but remain lower than average emissions from other sources in this sector, such as from the use of electricity, or from air conditioning gas leaks.

Results from the food waste reduction monitoring in Vang Vieng

The following table presents the results of food waste per customer from the businesses part of Swisscontact’s programme in Vang Vieng:

Vang Vieng data - 6 SMEs	1st month	2nd month	3rd month	4th month
Average daily spoilage per customer in gram	177	99	89	85

⁷ <https://www.nature.com/articles/s41598-023-34174-z>

In Vang Vieng businesses demonstrated significant progress, achieving an average 40% reduction in food waste generation, setting a strong example for the industry.

Unfortunately, one observed a business violated the trend, resulting in a concerning 19% rise in food waste. This highlights the necessity for ongoing assistance and specific actions for failed companies.

4.2. Food Waste Related Costs Estimations

Food waste cost estimations

The following tables present the costs of perishable and non-perishable food per customer as interviewed by the businesses of this survey:

Cost of Perishable food per customer (kip)	Restaurant	Café	Hotel	Cost of Non-Perishable food per customer (kip)	Restaurant	Café	Hotel
Min	2,782	1,667	7,752	Min	2,336	1,131	6,971
Average	18,566	35,569	26,102	Average	3,831	1,131	6,971
Median	14,105	18,907	30,890	Median	3,146	1,131	6,971
Max	48,524	111,020	34,876	Max	6,410	1,131	6,971

Building on measured and interview-derived ratios of food waste to purchased food, we estimated food waste costs by multiplying these ratios with the corresponding cost components identified through the same data sources.

Ratio Food Waste/Purchased food	Restaurant	Café	Hotel
Min	0.20	0.29	0.17
Average	0.56	0.68	0.53
Median	0.53	0.73	0.26
Max	1.00	1.00	1.00

The table hereunder presents our estimations of food waste costs for the businesses of this study:

Estimated maximum food waste cost per customer (Kip/Customer)	Restaurant	Café	Hotel
Min	2,431	2,204	2,388
Average	8,262	16,875	10,982
Median	7,349	6,716	8,134
Max	14,982	47,939	27,556

By gathering data both on the amounts of food purchased and measurements of food waste, we were able to calculate the percentage of food that ends up as food waste. However, due to

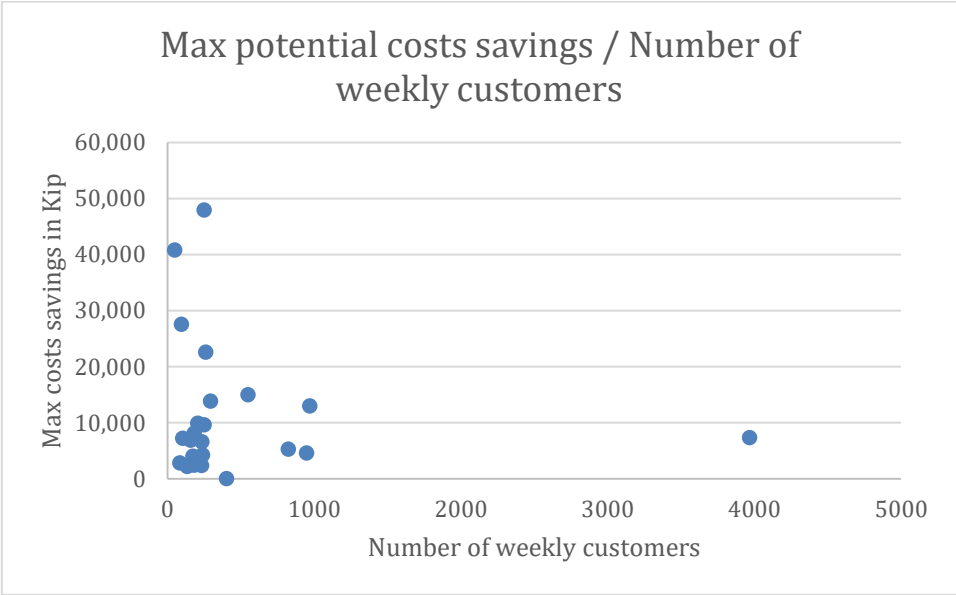
limitations in the accuracy of food purchase data, we observed a few instances where the ratio of food waste to purchased food exceeded 100%, which is by definition impossible. In these cases, we conservatively capped the percentage at 100% to maintain consistency and avoid misleading interpretations.

For reference, the exchange rate at the time of writing is approximately 1 USD to 20,700 Laotian Kip (kip).

Our calculations estimate that the median cost of food waste for the businesses of this study is between 7,000 kip and 8,000 kip per customer.

Furthermore, it appears that more than 30% of the businesses can save up to 10,000 kip or more per customer if they reduce food waste to a minimum.

The following diagram shows the results of food waste costs in comparison with the businesses' weekly number of customers:



The diagram reveals a differentiated picture for food waste costs: Businesses with small customer bases show a wider range of costs, encompassing low, average, and high levels. However, a clear relationship emerges as customer numbers climb, with a consistent decrease in food waste costs. This pattern could be attributed to increased focus on cost optimization among businesses serving larger clientele. It is important to acknowledge that significant financial benefits remain in reducing food waste, specifically for businesses serving many customers.

While our analysis relies on self-reported business costs and may contain inconsistencies, overall trends remain valuable and offer key insights into the broader situation.

Moreover, our interviews illustrate a heightened awareness of cost management among businesses in the wake of the COVID-19 crisis.

Disposal costs

The results for disposal costs show that cafés have the lowest waste collection costs. Their median monthly waste disposal cost is 60,000 kip per month. This is likely due to their observed lower waste generation compared to restaurants and hotels.

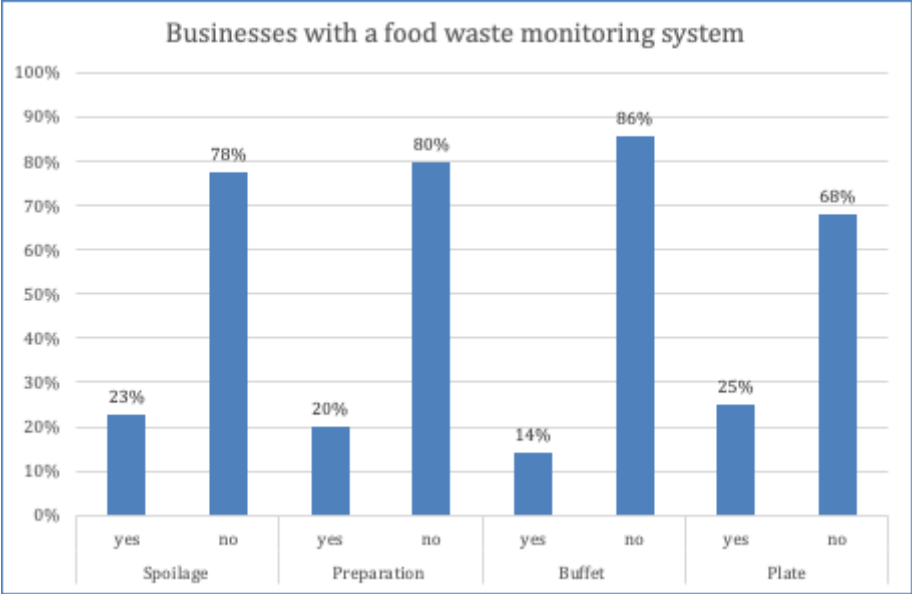
Restaurants fall in the middle, with a median monthly cost of 300,000 kip per month, resulting from a higher volume of food waste.

Hotels show higher median cost with 650,000 kip per month. This points toward higher waste generation, including mixed waste kinds that likely exaggerate expense estimates.

Although waste disposal costs can be significant in specific cases, average monthly costs may not be an immediate financial incentive for all businesses. Even though they are advantageous, potential savings might not make action a top priority.

4.3. Current Monitoring Practices

The following diagram shows the number of businesses (out of 15) having a food waste monitoring system:



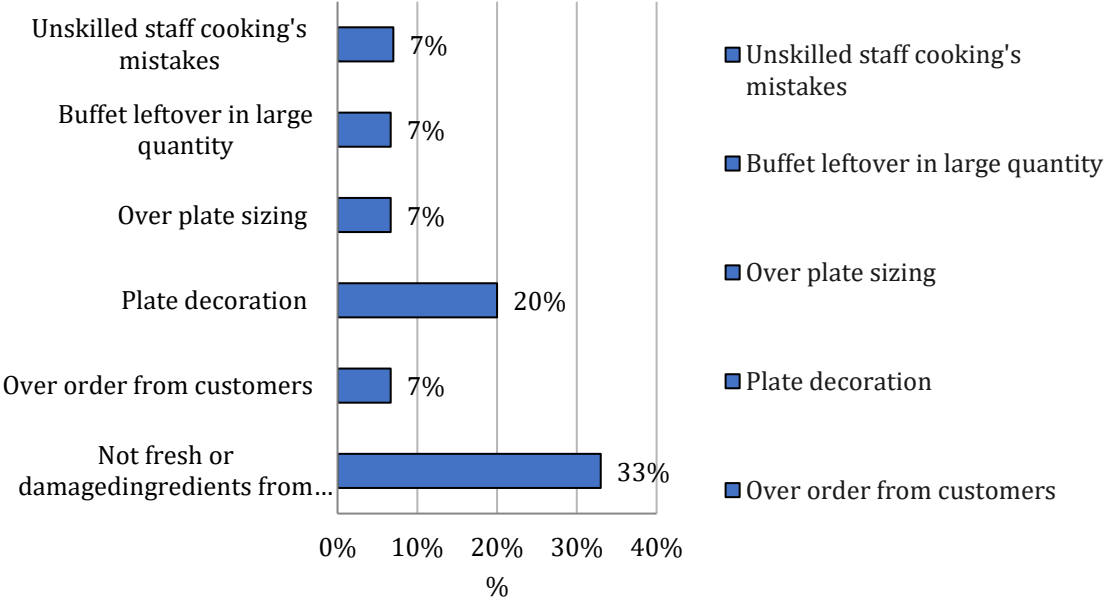
Food waste monitoring remains limited among surveyed businesses, with only 30% implementing any form of tracking. Buffets fare even worse, with only 14% employing dedicated monitoring. For the stages of spoilage, preparation, and plate waste, only around 20% have dedicated monitoring systems in place.

This lack of insight into waste generation hinders effective reduction efforts. Prioritizing robust monitoring across all stages – spoilage, preparation, and plate waste – is critical for identifying hotspots and guiding targeted interventions.

Food tracing and food waste causes

The analysis of the qualitative interviews revealed that approximately 60% (8/15) of the businesses surveyed employ food tracing practices. Most of these businesses utilize dedicated forms and procedures to track the origins and movements of their food items. This suggests that there is potential for improvement among businesses that do not currently trace their food, and provides a solid foundation for those seeking to enhance their food waste management practices.

Causes for food waste



When asked about the primary causes of food waste in their operations, businesses overwhelmingly attributed it to the receipt of fresh or damaged ingredients from suppliers. In light of this, it would be beneficial for future communication and training initiatives to emphasize the potential of utilizing even slightly imperfect or blemished vegetables.

The second most frequently cited factor was excessive plate decoration, which can be addressed by reconsidering the presentation of dishes. This emphasis on mindful plating practices should be incorporated into future training programs.

Other contributing factors mentioned included mistakes made by inexperienced staff, over-ordering by customers, oversized plate portions, and a significant amount of leftovers from buffet setups.

An interesting approach adopted by one standard (lao meat fondue) restaurant involved implementing a fine for customers who left behind excessive food waste. This strategy seems to be effective for them.

4.4. Current Food Waste Management Practices

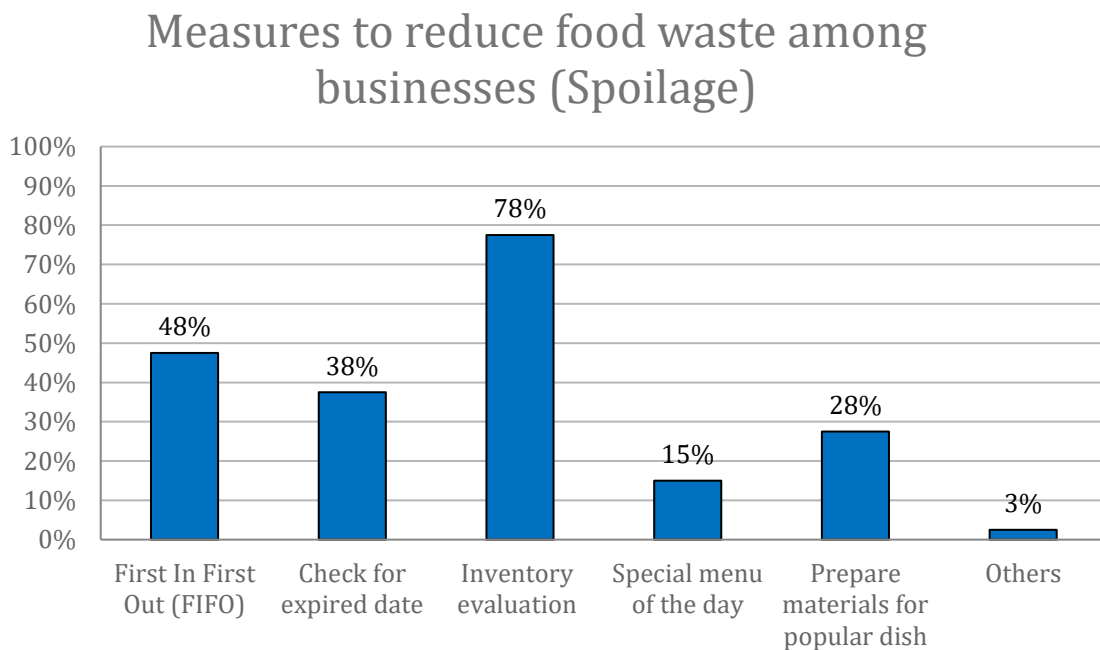
General food waste management approach

Our findings from the qualitative interviews indicate that a significant majority of businesses (80%) have implemented food waste management systems, while only a small minority (20%) lack such systems. The following responses suggest that businesses primarily employ a few waste management measures rather than comprehensive, integrated systems.

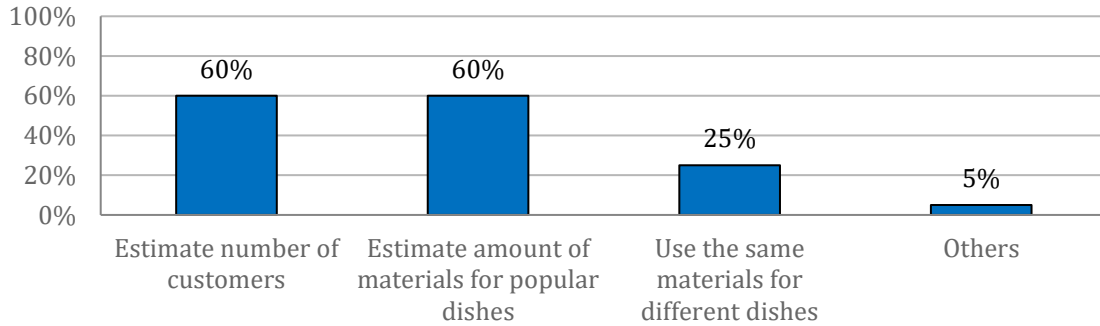
A majority of businesses surveyed have established internal rules for food waste management, primarily focusing on two key aspects: separating food waste from other types of waste and utilizing it as animal feed. While this demonstrates a commendable initial step towards waste reduction, there remains a significant opportunity to enhance these systems by implementing more comprehensive and impactful practices.

Food waste reduction

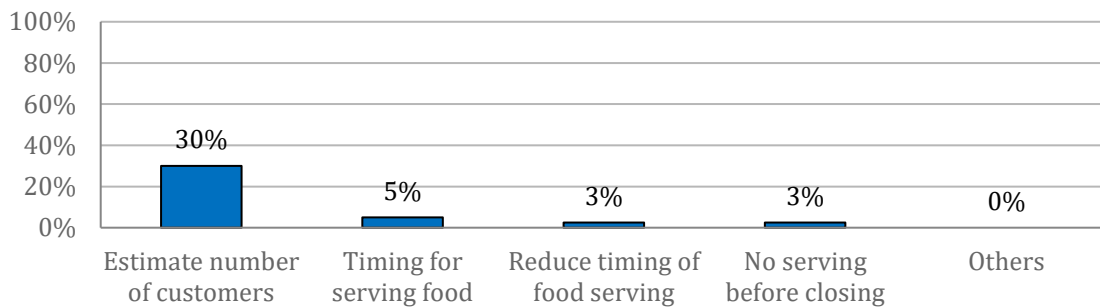
The following diagram shows the number of businesses interviewed in the quantitative analysis having food waste reduction measures:



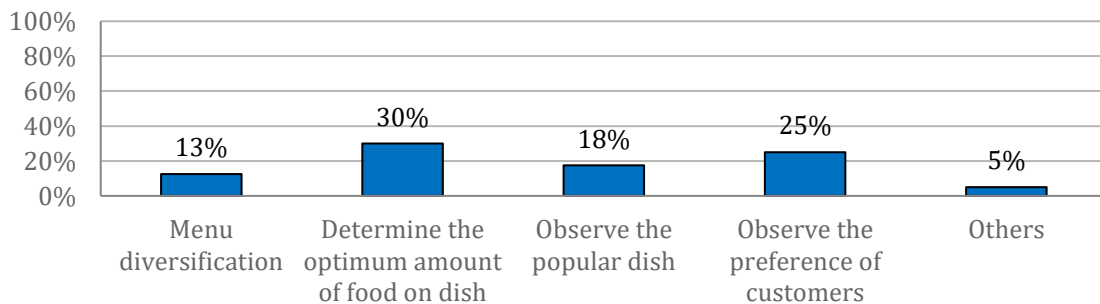
Measures to reduce food waste among businesses (Preparation)



Measures to reduce food waste among businesses (Buffet)



Measures to reduce food waste among businesses (Plate)

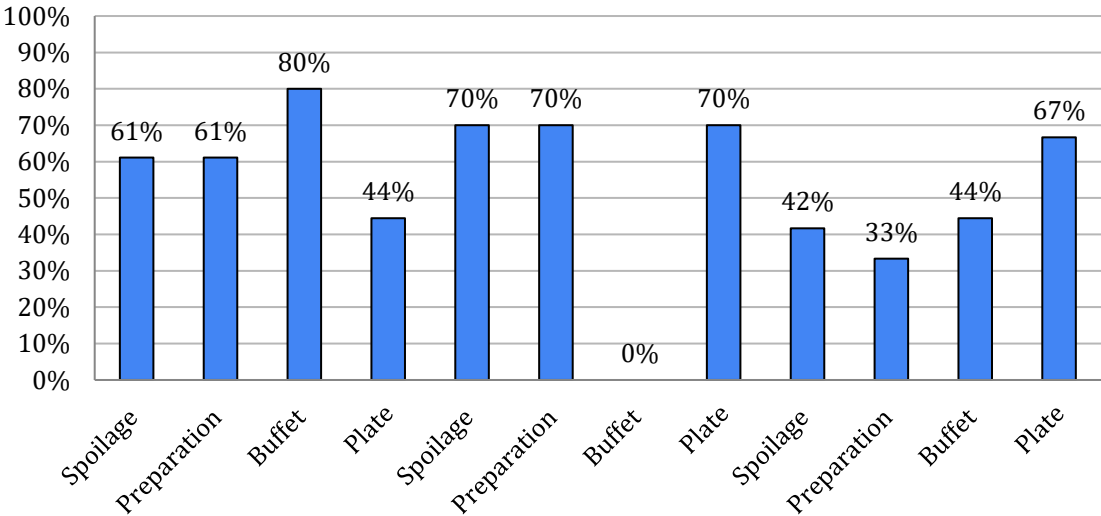


While most businesses report implementing measures at the spoilage and kitchen stages, the same cannot be said for buffets and plate waste. In these crucial areas, only a minority of businesses actively take steps to minimize waste. Notably, the variety of potential reduction strategies at each stage seems unused within the surveyed group.

Food waste separation

Our survey reports that 70% of the businesses interviewed have implemented at least one method for separating food waste.

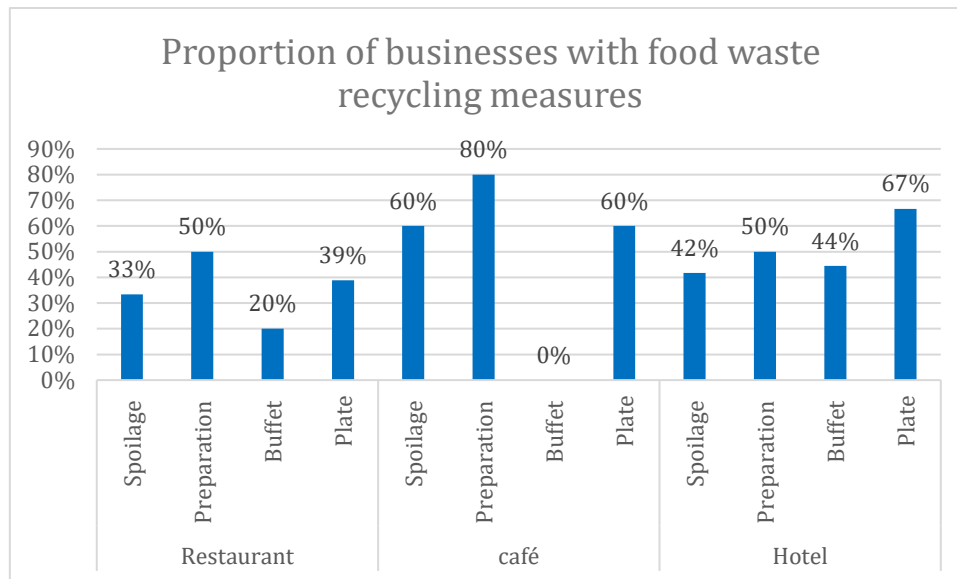
Proportion of businesses with food waste separation measures



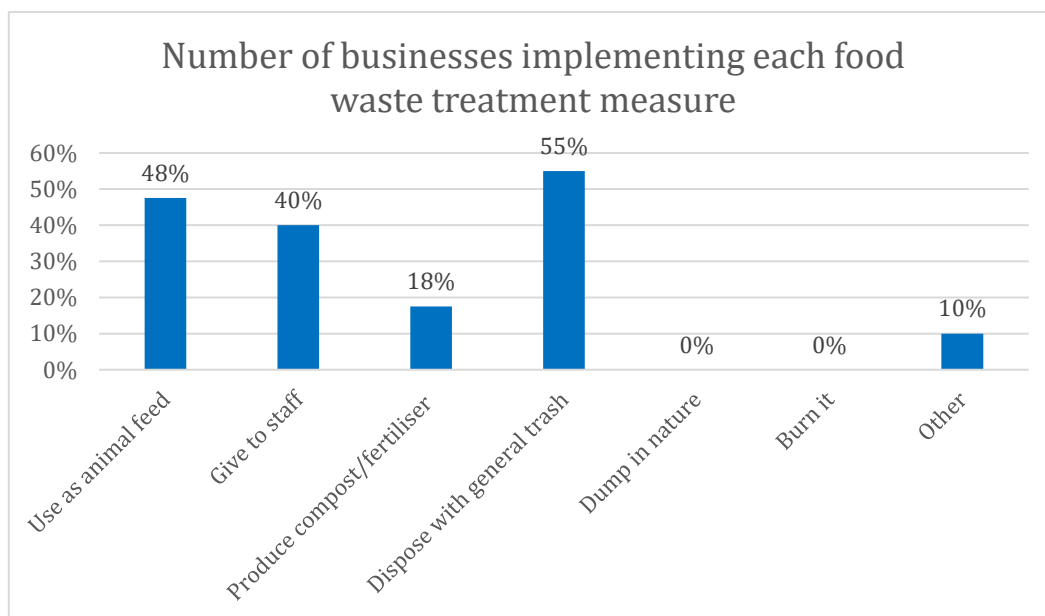
A positive outcome of the survey is the widespread adoption of food waste separation among businesses. Over 70% use at least one separation measure, demonstrating some commitment to waste management practices. This foundation provides promising leverage for future advancements. By building on this existing practice, the next step can be to enhance data collection capabilities. Specifically, tracking food waste volumes at different stages of the food chain would offer valuable insights for targeted reduction strategies.

Food waste recycling & other treatment measures

Our survey reports that 70% of the businesses interviewed have implemented at least one method for recycling food waste.



The following table shows the different types of food waste treatment measures performed by the businesses and the number of businesses performing them. Despite 70% of the businesses performing recycling measures, disposal remains a prevailing treatment measure:



Among the businesses surveyed, recycling food waste is a quite prevalent practice; over 70% of the enterprises had at least one method in place for separating food waste. Interviews revealed several key practices:

- ❖ **Staff consumption:** Providing leftovers to staff remains a common approach, offering both waste reduction and employee benefits.
- ❖ **Animal feed:** Donating food waste for chicken or animal feed represents another established recycling method.
- ❖ **Innovative practices:** A few businesses showcase promising alternative techniques like biogas generation, promoting leftover consumption before disposal, and repurposing leftover ingredients for other dishes.

4.5. Knowledge, Skills and Attitude (KSA)

Every single HORECA business we surveyed (100%) said they have never received help besides Swisscontact activities with improving their food waste management.

Our analysis reveals a significant gap in training and capacity-building resources within Laos regarding food waste reduction and management. Despite some support from Swisscontact for specific staff in certain businesses, the majority have not benefited from comprehensive food waste audits or in-house training programs. This lack of dedicated training leaves businesses under-equipped to effectively implement necessary interventions and develop long-term waste reduction strategies.

Staff skills and capacities

In terms of staff's ability to set new food waste reduction procedures, respondents offered a range of perspectives. Some businesses emphasized the reliance on management staff and perceived limitations in staff experience and skills, while others highlighted their ability to follow instructions, adapt to new guidelines, and grasp the specific challenges faced in restaurants.

A strong 11 out of 15 interviewees identified a clear need for staff training in various aspects of food waste reduction, including food repurposing, hygiene practices, waste separation techniques, cost-saving strategies, environmental considerations, and culinary skills.

Available support in implementing food waste management systems

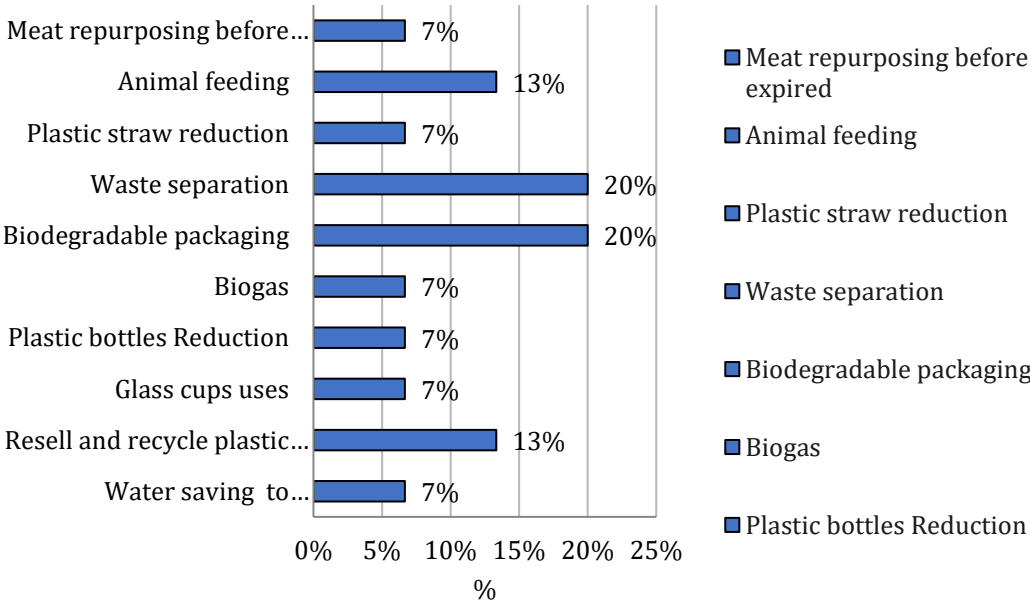
Finally, none of the businesses surveyed had ever engaged the services of consultants or companies to assist them in improving their food waste management practices. Moreover, the research team found no such services readily available within Laos.

Customer information

The study revealed that only a small percentage of customers only are actively informed about the issue of food waste during their dining experiences (only in 2 out of 15 businesses). Further questions revealed that they were largely unaware of this type of communication, suggesting the need to integrate customer education into future waste reduction programs.

Eco friendly initiatives

Eco-friendly initiatives



The majority of businesses have adopted eco-friendly measures, indicating a genuine commitment to environmental responsibility. The following practices were among the most frequently cited eco-friendly initiatives:

- Meat repurposing before expiration date
- Reduction of plastic
- Waste separation
- Biodegradable packaging
- Customer recommendations for water saving

While these measures demonstrate a positive inclination towards environmental stewardship, their effectiveness in reducing the environmental impact of food-service operations requires further evaluation and assessment.

4.6. Gaps inside HORECA businesses

Perceived difficulties

The following table shows the difficulties businesses expect, should they undergo an improvement in their food waste management system:



Our analysis reveals a concerning disconnect between the actual levels of food waste observed in surveyed businesses and their self-assessment. Despite the quantitative data indicating relatively high waste levels, most businesses did not perceive it as a significant issue. This suggests a critical lack of awareness regarding the scope and impact of food waste within these businesses.

Two primary factors seem to hinder effective food waste reduction efforts:

- ❖ **Data Blindness:** The absence of robust monitoring systems prevents businesses from accurately assessing the extent and origin of their waste generation, preventing them from seeing and acknowledging the actual scale of the problem.
- ❖ **Skills and Management Gaps:** Limited staff knowledge and inadequate management practices further contribute to ongoing waste issues. Future programs should prioritize addressing these gaps by:
 - **Implementing efficient monitoring systems:** Providing businesses with transparent data on their waste generation is crucial for raising awareness and driving action.
 - **Skill-building training:** Equipping staff with practical food waste reduction techniques and knowledge will empower them to actively participate in improvement efforts.
 - **Effective staff management:** Implementing clear waste management protocols and responsibilities within the business structure will ensure consistent practices and accountability.

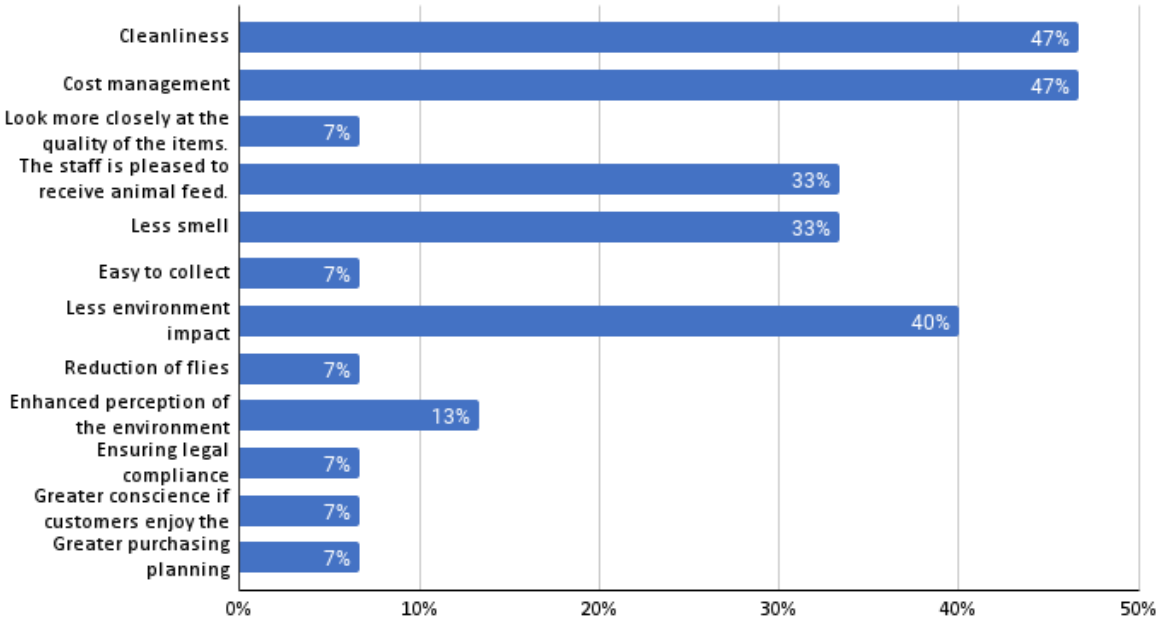
A significant proportion of businesses surveyed (9 out of 15) identified implementing food waste measures as a challenging endeavor. The primary factors cited include the substantial effort required for monitoring and training staff, as well as the influence of ingrained cultural practices.

An overwhelming majority of businesses surveyed (13 out of 15) reported not having dedicated staff specifically responsible for managing food waste. The primary reasons cited were a lack of perceived urgency and potential costs.

Perception of food waste management

Only a small proportion (4 out of 15) of businesses surveyed actively measure their food waste generation. Among those that measured waste, the most common practice was counting the number of waste bags generated. Other monitoring methods, such as inventory monitoring or cost tracking, were mentioned by only one business. Notably, more comprehensive practices, such as directly measuring food waste, assessing customer satisfaction with portion sizes and dishes, and recording orders and customer counts, were not reported by any of the businesses interviewed.

Expectations of food waste management advantages



The businesses surveyed recognized a diverse range of benefits associated with enhancing their food waste management practices. The primary advantages highlighted included environmental responsibility, cost savings, improved sanitation, reduced odor, and the potential to provide animal feed for staff engaged in livestock raising.

Willingness to overcome gaps

The qualitative interviews revealed that only 2 out of 15 businesses had implemented recent measures to improve their food waste management practices. This suggests a lack of urgency or commitment to tackling this issue, potentially stemming from a lack of awareness about the problem and the availability of effective training programs.

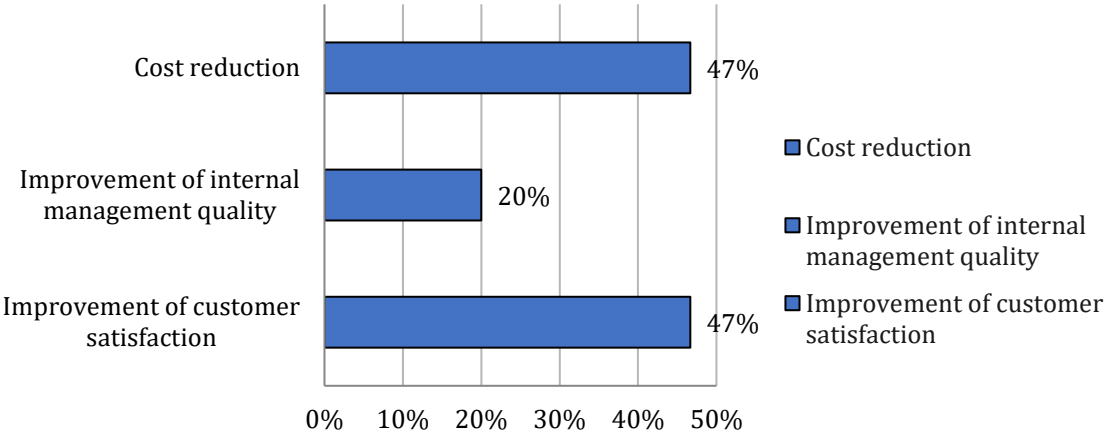
Nevertheless, half of the businesses interviewed are already considering implementing measures in the near future.

Moreover, a significant majority (10 out of 15) indicated a willingness to allocate dedicated staff time to address this issue, demonstrating a promising level of commitment should the appropriate opportunities arise.

Another encouraging sign is that 11 out of 15 businesses would be willing to consider adjusting their menu, a measure that has been shown to effectively reduce food waste. This willingness to adapt their offerings stems from a dual focus on cost savings and customer satisfaction.

In addition to modifying their menu, 10 out of 15 businesses would consider adjusting the ingredients they use in their dishes.

Most important driver for your premises to address food waste



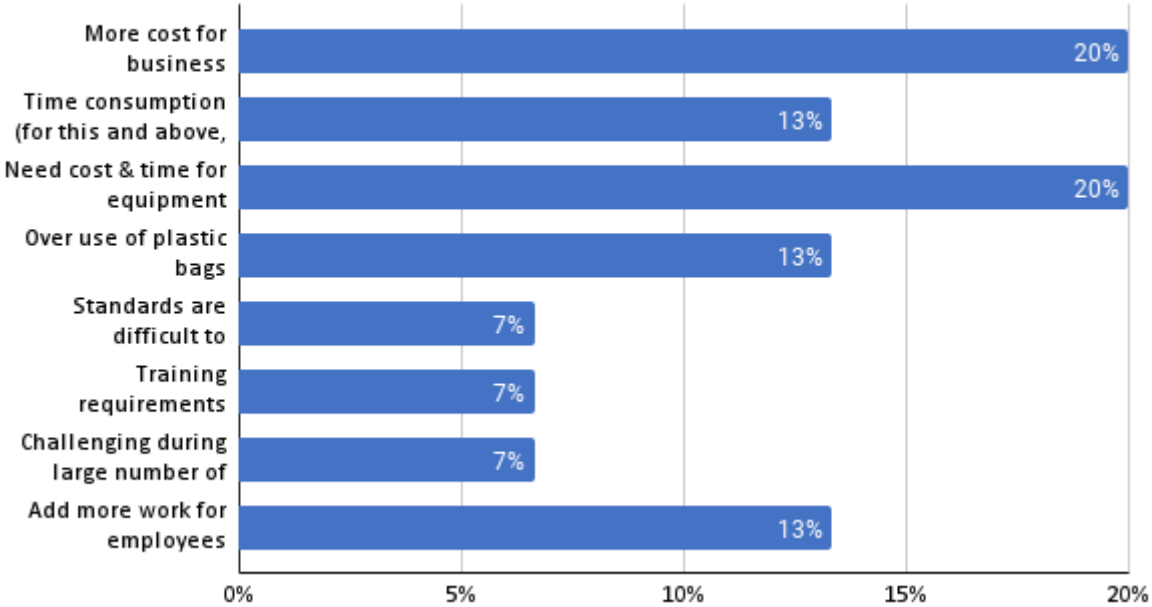
Businesses surveyed expect that improving their food waste management would yield significant benefits, including reduced costs, enhanced customer satisfaction, and improved internal management quality.

The following table shows the interest of surveyed businesses to improve their food waste management:



Our survey identified a remarkably positive reception among businesses towards improving their food waste management practices. A combined 96% expressed either interest (28%) or strong interest (68%) in tackling this issue. This high level of engagement creates a highly advantageous context for implementing future programs and interventions.

Disadvantages of food management waste answers occurrence



While acknowledging the potential benefits, businesses expressed concerns about the associated costs and efforts involved in improving their food waste management practices. They expressed apprehensions regarding the potential financial burden, particularly in terms of employee time and the procurement of specialized equipment. Addressing these legitimate concerns early on and providing practical examples of successful food waste management initiatives would be valuable additions to future programs.

4.7. Conclusions

The findings presented in this report paint a clear picture: food waste reduction presents a significant opportunity for HORECA businesses in Vientiane and Vang Vieng. While some existing practices demonstrate an interest in sustainability, there is substantial room for improvement across data collection, monitoring, and targeted reduction strategies.

Equipping businesses with the necessary tools is paramount. Training programs focusing on efficient monitoring systems, skill-building in areas like food repurposing and portion control, and effective staff management are crucial. Collaboration with training providers can bridge the current gap in available services within Laos. Implementing standardized recording procedures will ensure reliable data collection. Enhancing customer awareness through targeted communication programs can further incentivize waste reduction efforts.

For hotels, specifically addressing high buffet waste compared to plate service is essential. Businesses are receptive to menu adjustments that minimize waste, such as reducing portion sizes or offering customer recommendations to help customers avoid over-ordering.

By embracing these recommendations, HORECA businesses can achieve a win-win scenario. Our study indicates that over 30% of businesses could save up to 10,000 kip per customer by reducing waste. This aligns with the observed median food waste cost, which sits around 7,000 kip per customer for restaurants and cafes, and reaches 8,000 kip for hotels. Improved monitoring practices will allow businesses to accurately assess the financial benefits of waste reduction initiatives, further incentivizing their implementation.

Moving forward, collaboration between businesses, training providers, and potentially government agencies can solidify a sustainable future for the HORECA industry, minimizing environmental impact while maximizing profitability.

5. Recommendations

5.1. Food waste monitoring

To gain a comprehensive understanding of food waste generation and identify targeted reduction strategies, implementing the following monitoring practices is recommended:

- ❖ Ensure accurate guest counts
- ❖ Record orders numbers to assess popularity of dishes
- ❖ Record customers' satisfaction
- ❖ Dedicate a food waste bin to each prep-station to identify opportunities for waste reduction
- ❖ Measure food waste at different stages (spoilage, preparation, buffet, plate), ideally after separation into avoidable and unavoidable

5.2. Food waste management

Food waste reduction

To minimize food waste across all stages of your operation, consider implementing the following strategies:

Customer services:

- ❖ Communicate with clients about the food waste reduction and food recovery efforts
- ❖ Discount prices when you have food that needs to be used quickly before expiration
- ❖ Promotion Menu of the day to clients

Spoilage & sourcing:

- ❖ Follow up trends in dishes popularity and order accordingly, to avoid over purchasing
- ❖ First In First Out (FIFO)
- ❖ Inventory evaluation / Check for expiration dates
- ❖ Double-check inventory before ordering to prevent spoilage
- ❖ Buy ingredients with aesthetic imperfections (reduces food waste in the supply chain)
- ❖ Work with suppliers that have committed to minimizing food waste
- ❖ Work with local farmers (ideally organic farmers) to source season ingredients
- ❖ Ensure items received are of expected quality
- ❖ Review food stores monthly and use or donate under used food.

Preparation:

- ❖ Ensure that recipe specifications are available with quantities for kitchen staff
- ❖ Plan a second use for prepped meals in case of overproduction

- ❖ Encourage chefs to share their waste reduction strategies during staff meetings
- ❖ Use low waste ingredients.
- ❖ Reduce the total number of ingredients by using the same ingredient in different preparations.
- ❖ Reduce food weight per cover. Most guests consume about 0.54 Kg of food per meal.
- ❖ Estimate number of customers
- ❖ Estimate amount of materials for popular dishes & prepare accordingly
- ❖ Repurpose and multiuse ingredients
- ❖ Prepare portions in advance for all dishes
- ❖ Special menu of the day depending on available fresh products and FIFO results
- ❖ Set aside food scraps for animal feed.

Buffets:

- ❖ Consider alternative display or plating strategies to combat overconsumption on the buffet
- ❖ Check headcount before serving buffet
- ❖ Display foods horizontally instead of piling
- ❖ Serve items in small individual servings instead of chafing dishes
- ❖ Separate mixed items when possible to give guests choice while maintaining freshness
- ❖ Use dispensers with lids to preserve freshness
- ❖ Reduce plate and utensils size
- ❖ Set high value items a la carte
- ❖ Put out increasingly smaller chafing dishes
- ❖ Facilitate communication between kitchen and serving staff to relay buffet supply status
- ❖ Use blast chilling equipment to preserve food quality for reuse or recovery

Plate:

- ❖ Adjust plates portions, propose big/small sizes
- ❖ Support client to do “Take away bags”, ideally with biodegradable packaging
- ❖ Observe popularity of dishes & adjust menu accordingly
- ❖ Ensure orders are correct

Food waste separation

To establish an efficient and effective food waste separation system, consider implementing the following practices:

- ❖ Identify the locations within the premises where food waste is generated
- ❖ Determine the location(s) to separate food waste.
- ❖ Dedicated food waste separation and collection containers for each type of waste (food waste and other types of waste).
- ❖ Separate waste- Segregate the dustbins for dry and wet waste.
- ❖ Clear Signage at Food Waste Collection Points

- ❖ Reviewing the Food Waste Segregation Process:
- ❖ Tonnage of food waste recycled
- ❖ Percentage of contamination of food waste bin
- ❖ Types of food waste thrown
- ❖ Dispose of biodegradable waste with the local garbage trucks or begin a composting pit in the garden when possible

Food waste recycling & recovery

Feed Animals

Animal feed is a common and efficient method of recycling organic waste by feeding it to animals. Businesses can donate their kitchen waste, which the animals can consume. However, this method may cause health issues in animals. It is a common practice among businesses in Laos and should be promoted and facilitated.

Food waste treatment

Biogas

Biogas is a clean-burning fuel produced by the anaerobic digestion of organic matter, including food scraps. It is primarily composed of methane and carbon dioxide and can be used for electricity, heat, and powering vehicles and cooking stoves. Biogas combats food waste by diverting waste from landfills, reducing methane emissions and environmental impacts. It also generates renewable energy, helping to move away from fossil fuels and mitigate climate change. Biogas production facilities create jobs in rural communities and boost local economies. It also reduces reliance on landfills, providing a sustainable alternative for managing food waste.

Compost

Composting is the process of decomposing organic material by soil organisms, resulting in the recycling of nutrients into humus-rich components. It is an aerobic process that takes place under correct conditions of moisture and biological heat production. There are various composting systems, from simple bin composting for household use to large-scale reactor systems for industrial applications. Compost bins are suitable for simple kitchen waste and garden cuttings.

Vermiculture

Vermicomposting, the process of feeding food scraps to worms to produce nutrient-rich soil amendments, offers a sustainable solution to food waste and promotes circular economy principles. While the concept is promising, a testing phase might be needed to validate its effectiveness and ensure it can be scaled up for wider adoption.

Waste to biogas

Biogas is a clean-burning fuel produced by the anaerobic digestion of organic matter, including food scraps. It is primarily composed of methane and carbon dioxide and can be used for electricity, heat, and powering vehicles and cooking stoves. Biogas combats food waste by diverting waste from landfills, reducing methane emissions and environmental impacts. It also

generates renewable energy, helping to move away from fossil fuels and mitigate climate change. Biogas production facilities create jobs in rural communities and boost local economies. It also reduces reliance on landfills, providing a sustainable alternative for managing food waste.

5.3. Skills, Knowledge and Attitude

Lead

- ❖ Convening discussions between HORECA (Hotels, Restaurants, Catering, and similar) establishments and livestock farmers to explore collaborative strategies for diverting excess food from landfills and into animal feed applications.
- ❖ Organizing knowledge-sharing workshops among HORECA (Hotels, Restaurants, Catering, and similar) establishments to facilitate the exchange of best practices and experiences in food waste management. Ensure the active participation of staff members, who are directly involved in food waste management operations.
- ❖ Help develop training and capacity building for food waste management trainers.

Awareness

Launch a multi-faceted public awareness campaign to encourage individual and community behavior change towards food waste reduction.

Topics to address:

- ❖ What is compost?
- ❖ How does composting work?
- ❖ Compost: what it is, how it works
- ❖ Seasonality of products
- ❖ Ugly veggies/fruits: are they that ugly?
- ❖ When is food waste generated?
- ❖ What are acceptable amounts of food waste
- ❖ How much money can you save thanks to food waste reduction?
- ❖ Biogas: how it works, benefits
- ❖ Reduce!

Training

Implement a comprehensive in-house training program for selected businesses to effectively address food waste reduction strategies and optimize their operations.

Key Objectives:

1. Enhance staff understanding of food waste generation and its environmental, economic, and social impacts.
2. Develop a robust monitoring system to track food waste generation, identify areas for improvement, and assess the effectiveness of food waste reduction initiatives.

3. Equip participants with practical skills and techniques to minimize food waste at various stages of the food supply chain.
4. Develop a tailored food waste reduction plan tailored to each participating business's unique needs, operations, and resources.

Training Approach:

1. **Tailored Training Content and Schedule:** Personalized training sessions will be designed based on the specific needs, operations, and challenges faced by each participating business.
2. **In-House Training Delivery:** Trainings will be conducted on-site at the businesses to provide a hands-on learning experience and ensure relevance to their daily operations.
3. **Regular Training Sessions:** Training will be delivered in regular intervals, such as weekly sessions, to allow participants ample time to absorb the information and effectively integrate new systems into their operations.
4. **Engaging Training Methodology:** Utilize a variety of interactive and engaging training methods, including case studies, role-playing exercises, and hands-on workshops to foster active participation and ensure knowledge retention.

Participant Selection:

1. **Motivated Businesses:** Prioritize selecting motivated and enthusiastic individuals from participating businesses who have a demonstrated interest in reducing food waste.
2. **Cross-Functional Representation:** Ensure a diverse representation of participants from various departments within the business, including kitchen staff, managers, purchasing personnel, and sanitation team members.
3. **Key Decision-Makers:** Include key decision-makers within the business to ensure that the learnings from the training are integrated into company policies and practices.

Provide certifications for staff:

Incentivize staff participation in food waste reduction efforts by providing certification programs that can enhance their professional development and potentially lead to higher wages.

Training Curriculum example:

1. **Food Waste Fundamentals:** Provide an overview of food waste definitions, statistics, and the environmental, economic, and social impacts of food loss and waste.
2. **Identifying and Addressing Food Waste Generation Points:** Train participants to recognize the common sources of food waste within their operations and develop strategies to address them effectively.
3. **Reducing Food Waste at the Pre-Production Stage:** Implement strategies to reduce food waste during procurement, inventory management, and initial handling of incoming produce.

4. **Optimizing Food Preparation and Cooking Practices:** Emphasize techniques to minimize food waste during preparation, cooking, and portioning to avoid overproduction and spoilage.
5. **Effective Food Storage and Handling:** Educate participants on proper food storage procedures to extend shelf life and prevent spoilage.
6. **Repurposing and Donating Leftover Food:** Teach participants how to creatively repurpose leftovers into new dishes and explore opportunities to donate uneaten food to charities or food banks.

Evaluation and Continuous Improvement:

1. **Pre- and Post-Training Assessments:** Administer pre- and post-training assessments to measure participants' knowledge and understanding of food waste reduction strategies.
2. **Feedback Sessions:** Conduct regular feedback sessions with participants to gather their insights and suggestions for improving the training program.
3. **Ongoing Monitoring and Evaluation:** Continuously monitor and evaluate the effectiveness of the training program by tracking changes in food waste levels and assessing the adoption of new strategies.

5.4. HORECA

Certification

Establish a food waste management certification program to recognize businesses that have demonstrated excellence in their food waste reduction efforts.

This certification can be used by businesses to showcase their commitment to sustainability and food waste reduction in their communications and marketing materials, attracting environmentally conscious consumers and building a positive reputation for responsible practices.

Discounted unsold food sale app

Develop a mobile app that connects businesses with surplus food to consumers seeking discounted meals, similar to the Yindii app in Thailand (<https://www.yindii.co/>).

Link organic farmers to HORECA businesses

Local farmers, particularly the Lao Farmers Group, face significant challenges in selling their produce to HORECA establishments due to rigid standards that conflict with the nature of farming, particularly with seasonal produce. This disconnect has resulted in limited collaboration and a discontinued relationship between the two parties.

To address these challenges and re-establish a mutually beneficial relationship, Swisscontact can play a pivotal role in facilitating communication and collaboration between local farmers and HORECA. This can be achieved through a comprehensive strategy that encompasses:

1. **Aligning with Seasonal Availability:** Educate HORECA establishments about the importance of incorporating seasonal produce into their menus. This aligns with sustainable farming practices and ensures a consistent supply of fresh, flavorful ingredients.
2. **Establishing Direct Relationships:** Facilitate direct connections between local farmers and HORECA establishments, eliminating intermediaries and reducing costs. This promotes transparency and strengthens trust between both parties.
3. **Promoting "Ugly" Vegetables:** Encourage HORECA establishments to embrace "ugly" vegetables, which are perfectly edible but may not meet conventional cosmetic standards. This reduces food waste, supports local farmers, and educates consumers about the beauty of imperfection.
4. **Menu Development Guidance:** Assist HORECA establishments in tailoring their menus to align with the seasonal availability of produce from local farmers. This promotes sustainable sourcing practices and enhances customer engagement.
5. **Skills Development Training:** Provide training programs for HORECA staff on the benefits of sourcing produce from local farmers and the importance of supporting sustainable food systems. This fosters a culture of sustainability and responsibility within HORECA establishments.
6. **Proposing Contract Types:** Assist in developing contracts that are mutually beneficial to both HORECA businesses and farmers, outlining terms of purchase, pricing, and quality assurance.

By implementing these strategies, Swisscontact can effectively bridge the gap between local farmers and HORECA, creating a thriving network that benefits both producers and consumers. This will contribute to a more sustainable and equitable food system, enhance food quality, and support local economies.

6. Appendix

6.1. Experts meetings key findings

Lao Biogas

Details

1. Interviewee Name: Mr. Tong Wu
2. Interviewee Position: Owner
3. Interviewee Domain of Expertise: Technology Management
4. Organization Name: Lao Biogas (100% foreign investment)

Lao Biogas is a privately-owned company established in 2019 by a former China-based entrepreneur who recognized the potential of biogas technology to address the energy and waste management challenges faced by Laos. The company operates with a team of six individuals, including the owner who serves as the General Manager. The company's technical staff, consisting of two technicians, has successfully installed biogas systems across Laos, including Vientiane Municipality, Vang Vieng, Luang Prabang, and Pakse. To date, Lao Biogas has installed biogas systems in 15 hotels and 200 households, with 100 of these installations in Vientiane.

The company's biogas systems are designed to be user-friendly and can be installed without specialized engineering expertise. The technical staff, with an average of a high school diploma, is passionate about environmental sustainability and has received comprehensive training from the company's owner. The team is also equipped to provide ongoing online support to its customers.

Challenges in Food Waste Management

Bridging the awareness gap is key to unlocking progress. Staff and management alike often lack understanding of food waste issues, leading to careless practices and higher levels of waste. Targeted awareness campaigns can be the bridge, educating and driving positive change. But progress truly depends on engaged leadership. Consistent commitment from business leaders, even requiring a shift in mindset, is essential for achieving and sustaining significant reductions.

Unfortunately, in Laos, dedicated leadership involvement in this area remains limited. Lao biogas has proactively organized and contributed to HORECA training programs, offering valuable tools and knowledge. Yet, participation levels haven't met their full potential. This underlines the importance of comprehensive, targeted awareness campaigns and in-house training, especially for businesses receptive to support. Only through a combined effort at all levels can we effectively turn the tide on food waste.

Recommendations for Enhancing Food Waste Management in HORECA Sector

1. **Management Dynamism:**
 - Foster a supportive management environment that encourages open-mindedness, collaboration, and accountability towards food waste reduction initiatives.
2. **Staff Education:**
 - Educate staff about the benefits of biogas technology, emphasizing its environmental and cost-saving advantages.
3. **Building Trust:**
 - Build a strong and transparent relationship between HORECA businesses and biogas providers, ensuring mutual commitment and open communication.
 - Note: Trust is challenging without awareness and understanding, for example, fear of explosion; however, consistency and rigorous monitoring are essential for biogas systems.

Potential Implementation Difficulties of Improvements

1. **Navigating Political Dynamics:**
 - Past experiences in Pakse suggest a need for a more direct approach in addition to political considerations that prioritize environmental benefits.
2. **Concerns from Existing Sector's Stakeholders, among which Trash Collectors:**
 - Identify and address concerns from trash collectors and landfills, who fear a loss of business due to reduced trash bags and collections.
 - Suggested approach: Assess the impact on revenue and costs for stakeholders and provide alternative solutions like selling compost or adding value to sorted trash bags.
3. **A Collaborative Approach:**
 - Overcoming regulatory and logistical barriers requires a collaborative effort involving local authorities, ministry-level representatives, biogas providers, and waste management experts.

LHRA

Details

1. Interviewer Name: Mrs. Phonpaseuth Chandara
2. Interviewee Position: Secretary of LHRA (Operation)
3. Interviewee Domain of Expertise: External Communication/Events/Exposition/Trainer of Trainee
4. Organization Name: Lao Hotel Restaurant Association (LHRA)

Ms. Chandara serves as the LHRA's external communication hub, acting as the key interface for organizing events and expositions. Her recent collaboration with Swisscontact involved LHRA staff assisting in the delivery of food waste management training sessions.

LHRA conducts training sessions, with the latest one held in August 2023 at the Rose Hotel. Twenty participants, including managers and chiefs, focused on various aspects:

- Planning fresh food procurement, cooking, and service to minimize waste.
- Cost-saving strategies.
- Food safety.
- Management of food waste.

Challenges in Food Waste Management

1. Limited understanding among businesses regarding food waste management; focus is primarily on cooking tasty food.
2. Challenges in getting businesses to attend training:
 - Viewed as a waste of time.
 - Insufficient staff, resources, and time for service.
 - Incentives haven't proven effective.
 - Visits and calls to convince individuals are often unsuccessful due to time constraints.
3. Management skills and educational backgrounds pose challenges.

Recommendations for Enhancing Food Waste Management in HORECA Sector

1. It appears more fitting to conduct training sessions directly on-site, within the kitchens or at the businesses themselves. Generalized training programs may not align well with the Lao context.
2. Increase the frequency of training sessions.
3. Emphasize consistency over time to equip managers with the skills and tools needed to monitor and support their teams in achieving desired results.

GGGI

Details

1. Interviewer Name: Mr. George Asiimwe
2. Interviewee Position: Senior Officer, Waste Management, Waste Unit
3. Interviewee Domain of Expertise: Waste Management
4. Organization Name: Global Green Growth Institute (GGGI)

GGGI is involved in the KM 16 composting project in collaboration with KOICA, focusing on food waste management in Sikhotabong District. The project involves three villages, where selected food waste is collected to feed the composting center.

KM 16 serves as a pilot test area for the Waste Bank concept, featuring 15 cells for composting food waste. The same project is planned for replication in Vang Vieng,

Lao farmers group

Details

1. Interviewee Name: Mr. Khamphou Phanthaboun
2. Interviewee Position: President of Vientiane Organic Agriculture Group
3. Interviewee Domain of Expertise: Organic Farming
4. Organization Name: Vientiane Organic Agriculture Group

In 2023, the Vientiane Organic Agriculture Group consists of 286 family members across 6 districts in Vientiane Municipality, representing 10 farmer groups in addition to one group in Vientiane province. All 11 groups currently sell their produce at the ITECC organic market.

There is an ongoing project for composting, and the Lao Farmers Group is actively involved in their own composting efforts.

Challenges with HORECA Group:

Difficulties in consistently meeting the HORECA group's specific requirements regarding size, type, quantity, daily supply schedules, and pricing of vegetables posed significant challenges to fruitful collaboration. This inherent friction between the HORECA group's stringent standards and the natural variability of seasonal farming ultimately led to the decision to discontinue the partnership.

Recommendations for Enhancing Food Waste Management in HORECA Sector

Farmers would be happy to work with HORECA businesses demonstrating a commitment to purchasing available produce, with more flexible standards.

- **Mindset Change:**
 - Encourage a shift in mindset regarding standards and requirements for HORECA collaboration.
- **Use Seasonal Vegetables:**
 - Promote the use of seasonal vegetables, aligning with the natural production cycle.
- **No Grading:**
 - Eliminate the practice of grading, recognizing the variability inherent in organic farming.
- **Diverse Vegetable Usage:**
 - Encourage farmers to diversify their vegetable selection rather than focusing on a single type.

UDAA

Details

1. Interviewer Name: Mrs. Hatsady Khounsy
2. Interviewee Position: Deputy Chief of the Division of UDAA in Vangvieng
3. Interviewee Domain of Expertise: Waste Management
4. Organization Name: Urban Development Administration Authority (UDAA)

UDAA in Vang Vieng is the second governmental office nationwide in charge of waste collection after Vientiane (VUDAA/VCOMS), covering the Vientiane Province, including 10 small districts.

Operational for 10 years, UDAA ceased waste collection in 2019 due to vehicle breakdowns and subcontracted waste collection to the private company Eco-green, which owns three trucks (one out of order).

Challenges

- The waste collection cannot meet the needs, leading to challenges in areas with more waste than truck capacity.
- The ADB landfill project involves digging 5 cells for waste, with two done. The second cell reached 60-70% of its capacity in seven years, surpassing the estimated five-year period.

As a result, landfilling might become challenging and a major problem in Vang Vieng in the coming years.

Recommendations

- Need for more skills and training.
- Raise awareness to reduce waste and increase existing waste cell capacity.
- Create a mechanism for fair remuneration for waste pickers, involving village authorities in the process.

VCOMS

Details

1. Interviewer Name: M. Panya Manivong
2. Interviewee Position: Head of Solid Waste Management Division
3. Interviewee Domain of Expertise: Solid Waste Management
4. Organization Name: VCOMS

VCOMS is responsible for waste collection in Vientiane Municipality, operating with 10 private companies and one owned unit, totaling 11 waste collection units.

Tariffs set by the Mayor of Vientiane for household bags (25kg) are 10,000 kip per bag, with a reported monthly collection of 40,000 kip per household.

Recommendation

- ❖ Promote 3 Rs and waste separation.