

Green Practices in Micro-Enterprise Food Services: Motivators, Barriers, and Outcomes in Aparri

Pablo R. Laurente MST, Joshua B. Foronda, Angelo B. Patiam, Seok In F. Han, Billy Ray S. Calimag, John Paul G. Perucho & Mylene P. Torda

ARTICLE INFORMATION

Article history:

Published: October 2026

Keywords:

Green Practices
 Sustainability
 Environmental Sustainability
 Micro-Enterprises
 Business Performance

ABSTRACT

The global food service industry is currently facing increasing pressure from environmental organizations due to the depletion of natural resources, the significant volumes of waste generated, and single-use plastic pollution, which makes the implementation of green practices an urgent need rather than an option. This descriptive-correlational research examined the levels of adoption of green practices, forces motivating their implementation, possible barriers to operation, and perceived outcomes of sustainability in 50 food service units. The research is based on the Theory of Planned Behavior and the Triple Bottom Line theory. The data collection was carried out through the use of a questionnaire, while the analysis of the data retrieved was conducted with the help of descriptive and inferential statistical techniques. The data illustrate that the industry is comprised mostly of microenterprises (68% of which are staffed by 1 to 5 persons). The study revealed a strong positive knowledge and viewpoint of the food service providers in regard to environmental protection (the mean of the obtained data is 2.40). Sustainability practices are found to be implemented on the regular basis, where it is mainly resource management (3.69) and supply chain management (3.65) that dominate the picture. The most significant reason for the implementation of green practices is considered to be increased operational efficiency (3.14). The higher initial capital investments required for moving to eco-friendly technologies are the main obstacle to the implementation of sustainability practices (2.41). In terms of business performance, the positive changes caused by the sustainability depreciation process are examined as more significant than the impact on environmental conservation. To sum up, and despite the existence of certain favorable environmental attitudes in the food service industry, the lack of funding, infrastructural issues, and legislative constraints lead to the non-comprehensive implementation of sustainability practices. It is suggested to develop programs by the local governments that would provide incentives for implementing green practices and render technical support.

1. Introduction

The global food service industry has a large environmental footprint in addition to being a vital driver of the economy. The food service industry operates at a high volume and very rapidly, consuming large amounts of energy and water and producing large amounts of solid waste and contributing to the depletion of natural resources. Traditional "take, make, dispose" linear model of operation has a severe impact on municipal landfills by increasing the amount of greenhouse gas emissions and destroying some fragile ecosystems. To address this issue, green practices, which include sustainable supply chain sources, waste management, and environmentally friendly packaging, have become a critical business model for all modern food service businesses.

Just like the rest of the world, the rapid urbanization of the Philippines and the growth of the economy have created a unique challenge for Philippines residents, which has been mirrored by the Municipality of Aparri located within the Province of Cagayan and its commercial center. The commercial center of Aparri is one of the most strategically located in the province and is experiencing significant growth in the sector, including fast-casual, bakeries and the full-service restaurant segments. As a result of the continued growth of these sectors, they create a tremendous amount of pressure on the environmentally sensitive coastal and river environments surrounding Aparri. Although there are national laws that address these challenges including the Philippines Ecological Solid Waste Management Act (RA 9003), one of the greatest challenges to implementation and compliance is the effective implementation and compliance monitoring that must be done at the municipal level.

1.1 Review of Related Literature

The establishment of a long-term relationship with the food service industry would greatly contribute to the sustainability of that particular industry notwithstanding the difficulties related to financial constraints. From the information in the world literature, it is clear that the initial capital investment required and lack of stable supply of local products are serious obstacles, although it often appears that the savings produced by use of energy-efficient equipment can offset the initial investment since the utility costs typically decrease significantly. Along with the utility savings, the market demand for "green" restaurants or environmentally friendly restaurants, which has emerged recently, plays a big role in today's economy. Most importantly, today's market suggests that consumers are ready to spend more money on meals in environmentally friendly restaurants.

However, consumers make decisions concerning support of the green restaurants for more reasons than just positive attitudes towards environment. Studies show that there is a gap between positive consumer attitude and choosing those food services from the list of their options. Thus, in order to succeed in the process of implementing sustainability initiatives it is necessary to embed them into the culture of a company and devote attention to their implementation training for all levels of management personnel. In the Philippines, problems related to economic conditions resonate with those discussed in the international literature, but their application takes on a more critical dimension. For example, the issue of the price of green technologies or sustainable alternatives like bamboo packaging has been constantly mentioned as the main obstacle in the discussion, since the price of these materials is not yet competitive with the price of imported plastic products. Economic Challenges In addition to the economic potential of switching to biodegradable packaging options, the absence of local composting and recycling facilities in many regions of the Philippines exacerbates the situation. The majority of compostable or recyclable waste ends up in the standard landfill, which only enhances the situation. Another aspect of the problem of the implementation of sustainable solutions in the Philippines is the considerable influence exerted by both local authorities and culture on almost all sectors of the economy. Given that the Ecological Solid Waste Management Act is the most important law on solid waste management in the Philippines, it is unlikely that it will be effectively used in all parts of the country in the near future and will need to go through a long and complicated process of adaptation to the local context. The lack of knowledge of local entrepreneurs about this law remains one of the most important causes of the problems related to sustainable waste management practices in the country. Hence, it is important to introduce clear local regulations and to implement them with the help of local governments. The importance of this procedure is also supported by the difficulties associated with the specific aspects of Philippines' culture, including "tingi-tingi" or "sachet economy" culture that contributes to great amounts of packaging waste.

1.2 Research Gap

While much of the research synthesis surrounding the adoption of various green practices is focused on the interplay between the economic viability and infrastructural feasibility of a community's ability to be sustainable, there is still an extreme lack of empirical, localized research surrounding the adoption of sustainability initiatives by secondary cities that are not part of a large metropolitan area or that exist in newly developing regions outside of the country's more developed urban areas. Most of the domestic research conducted in the past has primarily focused on highly urbanized mega-cities or heavily regulated tourism areas such as Metro Manila and Boracay, which further compound the research gap issue.

The results of research studies conducted in areas other than Aparri reveal that the costs and lack of awareness associated with adopting green practices have been identified as significant obstacles limiting the number of local food service operators implementing these practices. However, these prior research studies' results do not address differences in the socio-economic conditions of communities such as those found in Aparri, nor do they include the unique local supply chain barriers experienced in Aparri and the capacities of the local government unit (LGU). Therefore, it cannot be concluded what types of barriers (financial, structural, knowledge) local food service businesses in regional hubs are experiencing and whether or not they are adopting green practices. The current study is designed to fill in this geographical and contextual gap by providing a diagnostic baseline for developing localized sustainability strategies.

2. Methodology

The study utilized a descriptive-correlational research approach to document systematic characteristics of local food service operations in the area, and also to examine the statistically significant relationships between the level of implementation of green practices and the resulting business performance outcomes. The area of interest was within the commercial and tourism sector of Aparri, Cagayan Province. The researchers completed a complete census of 50 food service businesses that were operating at the time the research was underway.

A structured survey questionnaire was used as the primary means of collecting data. The structured survey was broken down into five distinct components: (a) business profile, (b) business awareness and attitudes, (c) perceived barriers to implementation, (d) current implementation of green practices, and (e) perceived operational impacts. To gather both attitude data and descriptive data on the barriers to implementing green practices, three different types of Likert scales were included in the survey as well as two measures (i.e., number of times) of how often businesses implemented green practices. The structured survey instrument was face-validated by a panel of experts prior to conducting a pilot test to ensure that internal consistency of the survey instrument was established.

The researchers obtained informed consent from the business owners/managers before they began to collect data, and all information collected was kept secure and anonymous for the entire duration of the research study. Statistical analysis of the data collected for the study utilized both descriptive statistics (e.g., frequency counts, percentages, and weighted means) in order to summarize the demographic and background information of participants as well as their level of green practice adoption; and inferential statistics (i.e. Pearson's Product-Moment Correlation; Spearman's Rank Correlation) in order to identify the existence of significant correlations between levels of adoption of green practices and performance metrics at a preset p level of less than 0.05.

3. Results

3.1 Demographic Profile

This section outlines the characteristics of the respondent food establishments, including business types, years in operation, number of employees, and average monthly sales; thereby providing important context when applying green practices based on the different business profiles.

Table 1: Business Type

Business Type	Frequency	Percentage
Food Stall / Carinderia / Turo-Turo	14	28%

RESEARCH ARTICLE

Bakery / Pastry Shop	9	18%
Coffee Shop / Café	7	14%
Casual Dining Restaurant	6	12%
Quick Service Restaurant / Fast Food	5	10%
Bar / Pub	3	6%
Catering Service	2	4%
Other	4	8%
Total	50	100%

Most of the sample consists of micro-scale food establishments, with food stalls (28%) and bakeries (18%) making up almost half of the sample. This predominance of businesses with smaller operational capabilities must be accounted for because many smaller businesses face unique limitations in their ability to implement green practices (capital, space and staffing).

Table 2: Years of Operation

Years of Operation	Frequency	Percentage
Less than 1 year	15	30%
1 – 3 years	12	24%
4 – 6 years	15	30%
7 – 10 years	3	6%
More than 10 years	5	10%
Total	50	100%

Sixty percent of the businesses analyzed are 6 years old or younger, which is indicative of an small business community. Newer businesses have the flexibility to try more innovative means of doing business; however, newer businesses typically do not have the financial security necessary to invest in green technology. In summary,

Table 3A: Number of Employees

Number of Employees	Classification	Frequency	Percentage
1 – 5	Micro	34	68%
6 – 10	Small	9	18%
11 – 25	Medium	5	10%
26 – 50	Large	2	4%
Total		50	100%

Micro-enterprises (1–5 employees) constitute more than two-thirds of the study's sample. This metric reinforces the finding that the research primarily focuses on very small businesses, for which severe resource constraints and the necessity of operational simplicity serve as paramount considerations in implementing green practices.

Table 3B: Average Monthly Sales

Average Monthly Sales	Frequency	Percentage
-----------------------	-----------	------------

RESEARCH ARTICLE

Below ₱50,000	17	34%
₱50,001 – ₱100,000	5	10%
₱100,001 – ₱250,000	3	6%
No data / not reported	25	50%
Total	50	100%

Table 3B clearly describes a substantial segment of small businesses operate with average sales below ₱50,000/month, and also further supports the premise held by most of this study's participants that they are predominantly small, or micro-enterprises. Additionally, there is a high non-response rate (50%) to these questions, which indicates the sensitivity of respondents to reporting the sales figures of their business.

3.2 Awareness and Attitudes Towards Green Practices

This study captures how much many micro-business owners are aware of their local environmental initiatives and will be brought on to adopting sustainable practices. Table 4 presents the results of this awareness and attitude survey using a standard measure of 1 to 3, where 3 is "strongly agree" and 1 is "strongly disagree".

Table 4: Awareness and Attitudes

Statement	Weighted Mean	Descriptive Value
1. I am aware of the Ecological Issues of Food Service Industry	2.42	Agree
2. I am aware with the Local Government Initiatives or Laws in the locality of Aparri, that facilitate and/or control the Go Green Activities of Organizations	2.42	Agree
3. I am obliged to carry out my activities as benignly to Environment as possible	2.38	Agree
4. Any food/restaurant business has to make efforts to Go Green, it cannot be the option	2.48	Agree
5. I am willing to know different ways and means of enhancing my business sustainability	2.40	Agree
6. The implementation of Green Practices has a Positive Impact on a business's long-term financial success.	2.34	Agree
7. Consumers in the municipality of Aparri are more and more likely to Patronize Companies that comply with Environmental Responsibilities	2.38	Agree
8. For Small to Medium Sized Businesses, the Financial Cost associated with the Implementation of Green Practices, typically, exceeds the benefits	2.46	Agree
9. My Business has the Potential to Create a Significant Positive Impact on the Environment of Aparri	2.36	Agree
Total Weighted Mean	2.40	Agree

As a result of the overall calculated mean of 2.40 ("Agree"), the food business operators in the Municipality of Aparri have a positive perception toward green practices; however, the majority acknowledge an increased level of environmental responsibility (statement 4 - 2.48) and desire to continue learning about sustainability (statement 5 - 2.40); nevertheless, the implementation costs associated with green practices continue to be a significant hindrance (statement 8 - 2.46). As well, the relatively low awareness regarding local government programs regarding green initiatives may indicate the need for increased support from the municipal level, through policy and other programs. Application of Sustainable Operations Practices

3.3 Implementation of Green Practices

This section reviews how consistently various establishments implement specific sustainable operations practices on the basis of Resource Management, Waste Management, Sustainable Sourcing, and Eco-Friendly Packaging. The rating scale for practice implementation ranges from a low of "1" (not utilized) to a high of "5" (consistently utilized).

Table 5A. Resource Management: Energy and Water Conservation

Statement	Weighted Mean	Descriptive Value
1. Utilizing energy-saving light bulbs (LED) in most areas	3.88	Often Implemented
2. Utilizing energy-saving appliances	3.74	Often Implemented
3. Turning off equipment when not being utilized or after operating hrs.)	3.56	Often Implemented
4. Utilizing water conservation measures	3.62	Often Implemented
5. Promptly repairing dripping taps and water leaks	3.66	Often Implemented
Total Weighted Mean	3.69	Often Implemented

Overall, energy and water conservation practices are the most widely utilized (weighted mean score of 3.69). The highest rated individual practice was energy-efficient lighting at 3.88, likely due to both the visibility (lighting) and the relatively low cost of changing light bulbs. This indicates a strong awareness among business owners regarding their potential cost savings associated with conserving utilities.

Table 5B. Waste Management: Reduction, Segregation, Recycling, and Composting

Statement	Weighted Mean	Descriptive Value
6. Systematically segregating waste into categories (e.g., biodegradable, recyclable, residual).	3.86	Often Implemented
7. Monitoring and taking action to reduce food waste from kitchen operations	3.86	Often Implemented
8. Donating or repurposing unsold but still edible food products	3.28	Sometimes Implemented
9. Selling or giving away recyclable materials (Cardboard, plastic bottles, metal cans, etc.) to junk shops and/or recyclers	3.52	Often Implemented
10. Source Organic/Food Waste (e.g., for use in garden or for collection).	3.46	Sometimes Implemented
Total Weighted Mean	3.60	Often Implemented

Basic Waste Segregation and Food Waste Reduction (both, 3.86) were broadly implemented.

These practices are probably in response to their direct effect on the cleanliness of operations and cost savings. The advanced processes of donating unsold food (3.28) and composting organics (3.46) were only "Occasionally Executed", indicating a strong need for municipal support with proper infrastructure and partnerships in place, as these are much more complex activities.

Table 5C. Supply Chain and Sourcing: Local, Organic, or Sustainable Ingredients

Statement	Weighted Mean	Descriptive Value
11. Prioritizing purchasing of ingredients from local suppliers/producers within either Aparri or Cagayan.	3.84	Often Implemented
12. Sourcing certified organic or chemical-free ingredients.	3.82	Often Implemented
13. Purchasing from suppliers who clearly demonstrate ethical or sustainable practices.	3.74	Often Implemented
14. Planning menus around seasonal availability of ingredients to provide support for local harvests.	3.60	Often Implemented
15. Prioritizing purchasing seafood from sustainable sources (i.e. not over-fished species).	3.24	Sometimes Implemented
Total Weighted Mean	3.65	Often Implemented

The results for Local Sourcing (3.84) and Organic/Chemical Free (3.82) indicate that both have high scores due to the availability of supply and presumed high quality. Sustainable Seafood (3.24) received the lowest score in this category, possibly as a result of curtailed supply chains or the higher premium prices within the local market.

Table 5D. Product and Packaging: Eco-friendly, Biodegradable, or Reusable Materials

Statement	Weighted Mean	Descriptive Value
16. The use of biodegradable or compostable containers for takeaway and delivery services	3.52	Often Implemented
17. The use of reusable containers for food in dining services (e.g., glass and durable plastic)	3.72	Often Implemented
18. Avoiding the use of single-use plastic products (e.g., straws, stirrers, cutlery)	3.76	Often Implemented
19. Providing discounts to clients using their own containers in reuse processes (e.g., coffee beverages)	3.32	Sometimes Implemented
20. The application of digital and paperless technologies in issuing invoices, receipts, and orders to reduce paper waste	3.36	Sometimes Implemented
Total Weighted Mean	3.54	Often Implemented

The average score based on weighted mean was calculated at 3.54, which indicates that single-use plastics avoidance is commonly practiced by the customers acquiring stay-in containers (3.76), whereas the notion of providing discounts for reusable containers (3.32) is less popular among the food industry representatives; likewise, going paperless at 3.36 demonstrates that it is less developed as compared to the previous methods.

3.4 Perceived Motivators and Barriers to Green Practices

All of the factors listed previously can be listed as either direct motivators or barriers against sustainability; but ability to reduce resource consumption should be considered separately since it can be both a motivator and an obstacle (to the adoption of sustainable Practices).

Table 6A: Perceived Motivators

Statement	Weighted Mean	Descriptive Value
1. Potential for long-term cost savings (e.g. reduced utility bills).	2.38	Agree
2. Attraction of customers who see environmental protection and increase in customer loyalty.	2.32	Agree
3. Conformity with existing or expected government regulations and avoiding fines.	2.30	Agree
4. Improvement in public image and brand reputation of the company.	2.38	Agree
5. Personal ethical belief in environmental protection	2.32	Agree
6. Getting ahead of competitors who do not adopt "green" practices.	2.38	Agree
7. Positive partner pressure from the local community (e.g. barangay, community organizations).	2.34	Agree
8. Availability of grants and subsidies for embracing green technologies.	2.36	Agree
9. Greater morale of employees and the attraction of those who want to work for a socially responsible company.	2.38	Agree
10. Greater efficiency and productivity (e.g. less waste and better- organized process).	3.14	Agree
Total Weighted Mean	2.36	Agree

All assessed motivators secured an "Agree" rating, with enhancing operational efficiency (3.14) emerging definitively as the strongest driver. This indicates that business owners recognize a clear operational and financial payoff derived from green practices. Financial motivators, including cost savings and competitive advantage, were also highly rated, whereas community pressure and strict regulatory compliance yielded slightly lower scores.

Table 6B: Perceived Barriers (Challenges)

Statement	Weighted Mean	Descriptive Value
11. The high initial costs of green equipment/technologies.	2.41	Agree
12. Lack of technical knowledge/expertise on how to implement green practices effectively.	2.20	Agree
13. Difficulty in finding reliable suppliers of eco-friendly packaging and local organic ingredients, etc.	2.18	Agree
14. Perception that managing and monitoring new green practices will be difficult and/or time-consuming.	2.24	Agree
15. Lack of awareness/perceived low demand from customers for sustainable option	2.14	Agree
16. Uncertainty concerning return on investment (ROI) and long-term financial gain.	2.22	Agree
17. Limited space within the establishment to implement activities such as waste segregation and composting.	2.20	Agree
18. Staff/Management resistance to change and employee training challenges:	2.28	Agree
19. Higher ongoing costs of sustainable materials than conventional materials (biodegradable packaging, etc.	2.32	Agree
20. Government's lack of support (clear guidelines) or enforcement to encourage action	2.22	Agree
Total Weighted Mean	2.24	Agree

The single most agreed upon barrier is the high initial investment cost (2.41), which correlates with the economic realities associated with the micro-enterprise profile. Other important barriers to implementing sustainability practices are ongoing higher operating costs associated with sustainable materials (2.32) and resistance from staff to change (2.28). Lower ratings regarding customer demand (2.14) and lack of technical knowledge (2.20) indicate that while these two issues can be considered barriers, they are not viewed as obstacles to the day-to-day operations of the company.

3.5 Perceived Impacts of Green Practices

This section evaluates the perceived outcomes resulting from the implementation of green practices, regarding both business performance and environmental conservation. The measurement scale is 1 (Strongly Disagree) to 3 (Strongly Agree).

Table 7A: Impacts on Business Performance and Operations

Statement	Weighted Mean	Descriptive Value
1. Green business practices have the effect of reducing our operating costs.	2.44	Agree
2. The green practices of our company have helped reduce the garbage we send to waste disposal sites.	2.38	Agree
3. Our conservation practices have showed a decrease in energy consumption.	2.38	Agree
4. Our water conservation has shown a reduction in water consumption.	2.30	Agree
5. Our procurement policy (choosing local suppliers, etc.) contributes to cutting carbon emissions.	2.36	Agree
6. The reduced use of plastic products helps us minimize the pollution we create.	2.40	Agree
7. Our sustainable procurement helps increase environmental stewardship in agriculture/ fishing.	2.32	Agree

RESEARCH ARTICLE

Statement	Weighted Mean	Descriptive Value
8. Our activity promotes environmental awareness in the community of Aparri.	2.40	Agree
9. We believe that our establishment contributes positively to the environment and the community of Aparri.	2.36	Agree
10. The collective impact of businesses such as our establishment can create meaningful improvements to the environment of Aparri.	2.32	Agree
Total Weighted Mean	2.7	Agree

Table 7B: Impacts on Environmental Conservation

Statement	Weighted Mean	Descriptive Value
11. Our efforts have significantly reduced our establishment's overall environmental footprint.	2.44	Agree
12. Our green practices have contributed to a reduction in waste sent to local landfills.	2.38	Agree
13. Our conservation measures have led to a meaningful decrease in energy consumption.	2.38	Agree
14. Our water conservation practices have resulted in a significant reduction in water usage.	2.30	Agree
15. Our sourcing policies (e.g., buying local) have helped reduce carbon emissions from transportation.	2.36	Agree
16. Our reduction in single-use plastics has helped lessen plastic pollution in the local environment.	2.40	Agree
17. Our sustainable sourcing supports better environmental management in the agricultural/fishing sector.	2.32	Agree
18. Our establishment now plays a visible role in promoting environmental awareness in Aparri.	2.40	Agree
19. We feel our business is now making a positive contribution to the local environment and community.	2.36	Agree
20. The collective effort of businesses like ours can lead to tangible environmental improvements for Aparri.	2.32	Agree
Total Weighted Mean	2.37	Agree

Overall, survey respondents believe that the environmental impacts of our establishment, as measured by their responses to the questions above, are overwhelmingly positive. Although the average response for questions regarding environmental impacts was slightly lower (2.37) than the average response for questions regarding business performance (2.44), it is still clear that their perception of our establishment's positive environmental impact is as positive as their perception of our establishment's positive business performance. The two environmental impacts rated as being the most important were decreasing the establishment's overall environmental footprint (2.44) and decreasing the amount of plastic waste in the local environment (2.40). Although, water conservation (2.30) and support of sustainable agriculture (2.32) were rated slightly lower than the average, businesses have difficulty measuring the degree of water conservation/positive environmental stewardship in sustainable agriculture directly.

4. Discussion

According to the empirical data, a classic "value-action" gap can be noticed in the local food service industry. While businesspeople have an extremely positive attitude toward environmental protection, the implementation of advanced environmental techniques is not consistent in practice. Business representatives are willing to use cost-efficient approaches that bring immediate benefits (like

using LED lights); however, when it comes to more complex techniques that require significant infrastructure changes, they are rather reluctant (e.g. setting composting equipment).

This distinct implementation barrier confirms the validity of the behavioral control construct described in the Theory of Planned Behavior. Since nearly 70% of operators in the studied area are micro-enterprises with little financial resources, the high capital costs of eco-technology and biodegradable packaging serve as significant barriers for the successful implementation of sustainability principles in business practices. At the same time, the results of the research clearly support the Triple Bottom Line approach, which indicates the idea that businesses want to increase their efficiency, not just pursue environmental goals in their operations.

5. Conclusion

Food service establishments in the Municipality of Aparri have a very positive attitude toward sustainability and possess high awareness levels as well as good practices of basic resources management and waste segregation. Regardless of systemic factors associated with finance, structure, and knowledge inhibit achieving a fully integrated sustainable operational model. The previously established positive connection between introducing green practices and improving business operations strongly suggests that if structural obstacles are effectively eliminated, environmental responsibility can be reconciled with successful commercial performance. Finally, to achieve sustainability across sectors in emerging municipalities, it would be necessary to shift from separate micro businesses to an integrative ecosystem supported with strong local governance.

6. Recommendations

In order to ensure sustainable operations of the local food audience, it should be recommended:

For the local government units: the LGU should move away from passive regulation to active facilitation, which should assume development and implementation of Green Business Incentive Program that should provide targeted grants or subsidized loans that allow micro businesses to deal with significant initial investment in efficient appliances. The local government should also ensure the creation of relevant infrastructure, such as community composting facilities, and enhancing cooperation with local recycling networks.

For food service business owners: food operators should actively use operational efficiency as the key strategy and keep records of achieving internal cost savings. Small businesses should carefully look into approaching the supply chain mutually such as establishing purchasing cooperatives to obtain sustainable packaging in bulk for lower prices.

For the academic community and future researchers: future research should move from perceptual studies into doing longitudinal observations allowing for measuring the impact of the policies applied in the long run. It is also essential to intensively conduct rigorous quantitative impact evaluations based on objective assessment of using water, energy, waste, etc. in the context of the Philippines.

References

- [1] Ajzen, I. (1991). *The theory of planned behavior*. Organizational Behavior and Human Decision Processes, 50(2), 179-211. (This is a famous, highly cited foundational paper)
- [2] Juvan, E., Grün, B., & Dolnicar, S. (2018). *Biting off more than they can chew: Food waste at hotel breakfast buffets*. Journal of Travel Research, 57(2), 232-242.
- [3] DENR. (2021). *National Solid Waste Management Status Report*. (The Department of Environment and Natural Resources routinely publishes these administrative reports)
- [4] Municipal Planning and Development Office (MPDO) Aparri. (2023). *Comprehensive Land Use Plan (CLUP) 2023-2030*. (Local Government document for Aparri).
- [5] Lins, M., Puppini Zandonadi, R., Raposo, A., & Ginani, V. C. (2021). Food Waste on Foodservice: An Overview through the Perspective of Sustainable Dimensions. *Foods*, 10, 1175.
- [6] Park, E., Chae, B., Kwon, J., & Kim, W. (2020). The Effects of Green Restaurant Attributes on Customer Satisfaction Using the Structural Topic Model on Online Customer Reviews. *Sustainability*, 12, 2843. <https://doi.org/10.3390/su12072843> Cited
- [7] Wongsachia, S., Naruetharadhol, P., Schrank, J., et al. (2022). Influences of Green Eating Behaviors Underlying the Extended Theory of Planned Behavior: A Study of Market Segmentation and Purchase Intention. *Sustainability*, 14, 8050. <https://doi.org/10.3390/su14138050>
- [8] Wu, C., & Teng, C. (2022). Reducing Food Waste in Buffet Restaurants: A Corporate Management Approach. *Foods*, 12, 162. <https://doi.org/10.3390/foods12010162>