

SDG 12 Responsible Consumption and Production: Evidence From Manufacturing Companies in Taytay, Rizal

Alfredo J. Toledo, Jr., MBA

Graduate Student, University of Rizal System Binangonan Campus, Binangonan, Rizal Philippines

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Email of Corresponding Author: alfredotoledojr@gmail.com

Abstract

This study assessed the implementation of Sustainable Development Goal 12 (SDG 12) on Responsible Consumption and Production among food and beverage manufacturing companies in Taytay, Rizal, Philippines. Specifically, it described the respondents' personal and business profiles, determined the extent of SDG 12 implementation across the eleven (11) target areas, examined significant differences in the respondents' assessments according to selected profile variables, and developed an SDG 12 Compliance Model to strengthen sustainability practices. A quantitative descriptive research design was employed involving 210 managers, production staff, and factory workers from ten (10) registered manufacturing companies selected through simple random sampling using Slovin's formula. Data were gathered using a researcher-developed questionnaire that underwent expert validation and reliability testing. Statistical treatments included frequency, percentage, weighted mean, independent samples t-test, and one-way analysis of variance (ANOVA). The findings revealed that manufacturing companies generally often practiced SDG 12 principles (Grand Mean = 3.65), with Sustainable Tourism (4.29) and Awareness of Sustainable Development (4.23) receiving the highest ratings. Conversely, the 10-Year Framework Programme (2.48) and Scientific and Technological Capacity (2.77) were the least practiced indicators. No significant overall difference was found between managers' and staff members' assessments ($p = .656$), although significant differences were observed in Reduce Waste Generation ($p = .040$) and Phasing Out Harmful Subsidies ($p = .009$). Furthermore, job position, average monthly income, sources of capital, years of engaging in sustainable practices, and number of employees significantly influenced respondents' assessments. Based on these findings, an SDG 12 Compliance Model was developed to guide manufacturing companies in enhancing sustainability planning, environmental stewardship, and responsible production practices. The study recommends strengthening technological innovation, sustainability policies, and stakeholder collaboration to improve SDG 12 implementation in the manufacturing sector.

Keywords: Sustainable Development Goal 12 (SDG 12); Responsible Consumption and Production; Manufacturing Companies; Sustainable Manufacturing; Resource Efficiency; Waste Management; Food and Beverage Industry; Taytay, Rizal; Sustainability Compliance; Philippines.

Introduction

Sustainable development has become a central priority for governments, industries, and international organizations as environmental degradation, climate change, resource depletion, and waste generation continue to threaten global economic and social well-being. Businesses, particularly manufacturing companies, are increasingly expected to balance economic growth with environmental stewardship and social responsibility. This global shift has been institutionalized through the United Nations Sustainable Development Goals (SDGs), which serve as a comprehensive framework for achieving sustainable development by 2030. Among these goals, Sustainable Development Goal 12 (SDG 12) emphasizes responsible consumption and production by promoting efficient resource utilization, waste reduction, environmentally sound management of chemicals, sustainable business practices, and greater public awareness of sustainability.

According to the United Nations, SDG 12 seeks to ensure sustainable consumption and production patterns through eleven interrelated targets that encourage industries, governments, and consumers to adopt environmentally responsible practices. These targets include efficient management of natural resources, reduction of food loss and waste, environmentally sound waste management, promotion of sustainable procurement, strengthening scientific and technological capacity, and integrating sustainability into business operations. The SDG Report 2025 further revealed that approximately 13% of food is lost throughout the supply chain, while an additional 19% is wasted at the consumer level, highlighting the continuing inefficiencies in global production and consumption systems and reinforcing the urgency of improving sustainability across industries.

Manufacturing industries play a significant role in achieving SDG 12 because production activities directly influence resource consumption, waste generation, greenhouse gas emissions, and environmental quality. Sustainable manufacturing

has therefore emerged as an essential business strategy that integrates environmental protection, economic performance, and social responsibility. The Triple Bottom Line framework emphasizes that organizations should simultaneously pursue economic viability, environmental stewardship, and social well-being. Likewise, sustainable manufacturing incorporates resource efficiency, life-cycle thinking, waste minimization, green manufacturing, and carbon footprint reduction as core operational strategies that enable businesses to improve productivity while minimizing environmental impacts.

Several studies support the growing importance of sustainable manufacturing. Mensah (2019) described sustainable development as an approach that balances present economic needs without compromising the ability of future generations to meet their own needs. Similarly, Kuo et al. (2020) identified eco-design, compliance with environmental regulations, and effective waste management as major drivers that encourage manufacturing companies to adopt sustainable development practices. Hazem Ali (2021) further emphasized that integrating sustainability into manufacturing operations improves organizational competitiveness while ensuring compliance with international environmental standards. These findings collectively demonstrate that sustainability has become both an environmental responsibility and a strategic business advantage.

Within the food and beverage industry, sustainability has become increasingly important because of its substantial contribution to resource utilization, packaging waste, food losses, and environmental pollution. Kumar et al. (2025) observed that food and beverage firms are increasingly adopting eco-friendly production methods, sustainable sourcing, energy-efficient technologies, and circular economy principles to align with SDG 12. Long et al. (2018) likewise reported that sustainability concerns, including climate change mitigation, energy efficiency, and responsible production, have become important considerations in food manufacturing. Consumers are also becoming more environmentally conscious, placing greater demand on manufacturers to adopt transparent and sustainable production systems.

In the Philippine context, the food and beverage industry remains one of the country's major manufacturing sectors and contributes significantly to national economic growth. Rizal Province, particularly the Municipality of Taytay, continues to experience industrial expansion with the presence of various food and beverage manufacturing companies. At the same time, the province has actively promoted sustainable food production through partnerships among government agencies, educational institutions, and development organizations. However, despite these initiatives, limited empirical evidence exists regarding the extent to which manufacturing companies implement the specific targets of SDG 12. Existing local policies primarily emphasize solid waste management and environmental protection but are not directly aligned with the complete framework of SDG 12. Consequently, sustainability implementation among manufacturing firms remains inadequately documented and evaluated.

Although numerous international studies have examined sustainable manufacturing and responsible production, current literature indicates an uneven distribution of research across the Sustainable Development Goals. SDG 12 remains one of the least explored goals despite its critical contribution to environmental sustainability and industrial competitiveness. Furthermore, most existing studies focus on large multinational corporations or developed economies, leaving limited evidence regarding small and medium manufacturing enterprises operating in local Philippine settings. This research gap is particularly evident in Taytay, Rizal, where manufacturing activities continue to expand but comprehensive assessments of SDG 12 implementation remain scarce.

In response to these research gaps, the present study assessed the implementation of Sustainable Development Goal 12 among food and beverage manufacturing companies in Taytay, Rizal. Specifically, it evaluated the extent to which manufacturing firms practice the eleven target areas of SDG 12, examined differences in assessments according to respondents' profiles, and developed an SDG 12 Compliance Model that may serve as a practical framework for strengthening sustainable manufacturing practices. The findings of this study are expected to contribute to the growing body of sustainability literature, support evidence-based policymaking, assist manufacturing companies in improving their sustainability performance, and promote responsible consumption and production toward achieving the 2030 Sustainable Development Agenda.

Material and methods

2.1 Research Design

This study employed a quantitative descriptive research design to assess the extent of Sustainable Development Goal 12 (SDG 12) implementation among food and beverage manufacturing companies in Taytay, Rizal.

2.2 Locale of the Study

The study was conducted among ten (10) food and beverage manufacturing companies located in the Municipality of Taytay, Province of Rizal, Philippines

2.3 Respondents of the Study

The respondents of the study consisted of 210 managers, production staff, and factory workers from ten (10) selected food and beverage manufacturing companies in Taytay, Rizal, determined using Slovin's formula with a 5% margin of error.

2.4 Sample and Sampling Procedure

The study employed simple random sampling, with the sample size of 210 respondents determined using Slovin's formula at a 5% margin of error from the total population of 443 employees in the selected manufacturing companies.

2.5 Research Instrument

The study utilized a researcher-developed, expert-validated questionnaire consisting of respondents' profile items and statements measuring the implementation of the eleven (11) target areas of Sustainable Development Goal 12 (SDG 12): Responsible Consumption and Production.

2.6 Data Gathering Procedure

Prior to data collection, the researcher secured the necessary approvals from the concerned authorities and obtained permission from the participating manufacturing companies. A validated questionnaire was then administered to the selected respondents, consisting of managers, production staff, and factory workers. The questionnaires were distributed either personally or through the designated company representatives, depending on the company's preferred mode of administration. After completion, the accomplished questionnaires were retrieved, checked for completeness and accuracy, and encoded for analysis. The collected data were subsequently organized, tabulated, and subjected to appropriate statistical treatments to address the objectives of the study.

2.7 Data Analysis Techniques

The collected data were encoded, organized, and analyzed using appropriate descriptive and inferential statistical techniques. Frequency and percentage distributions were used to describe the respondents' personal and business profiles. Weighted mean was employed to determine the extent of the implementation of the eleven (11) target areas of Sustainable Development Goal 12 (SDG 12). Independent samples t-test was utilized to determine significant differences in the respondents' assessments according to respondent groups, while one-way Analysis of Variance (ANOVA) was used to examine significant differences based on selected profile variables. All statistical analyses were conducted at the 0.05 level of significance to address the objectives of the study.

2.8 Ethical Considerations

The study adhered to established ethical principles throughout the research process. Prior to data collection, permission was obtained from the concerned authorities and participating manufacturing companies. All respondents were informed of the purpose, procedures, and voluntary nature of the study, and their informed consent was secured before participation. Confidentiality and anonymity of the respondents were strictly maintained by ensuring that no personal or company-identifiable information was disclosed in the presentation of the results. Participants were assured that they could withdraw from the study at any time without any consequences. The data gathered were used solely for academic and research purposes, stored securely, and handled in accordance with the agreed confidentiality and non-disclosure provisions to protect the privacy and integrity of both the respondents and the participating organizations.

Results and Discussion

3.1 Profile of Respondents

Table 1.1 presents the frequency and percentage distribution of the respondents according to their demographic profile. The findings reveal that the majority of the respondents were 21–30 years old (52.4%), followed by those aged 31–40 years old (30.0%), indicating that the manufacturing workforce is predominantly composed of young adults in their most productive years. In terms of sex, male respondents (60.0%) outnumbered females (40.0%), reflecting the male-dominated nature of the manufacturing industry. With respect to civil status, single respondents (49.5%) comprised the largest group, followed by married respondents (37.1%), while legally separated (11.0%) and widowed (2.4%) respondents represented smaller proportions. Regarding educational attainment, college undergraduates (47.6%) and college graduates (31.5%) accounted for the majority of the respondents, suggesting that most workers have attained tertiary education. In terms of job position, production staff (53.3%) constituted the largest group, followed by factory workers (29.1%), indicating that most respondents are directly involved in production operations. As to years of service, 1–5 years (55.2%) recorded the highest frequency, implying that the workforce is relatively experienced but still within the early stages of their careers. Finally, in terms of average monthly income, the largest proportion of respondents earned ₱20,001–₱30,000 (43.3%), closely followed by those earning ₱20,000 and below (41.9%), indicating that most employees belong to the lower- to middle-income bracket. Overall, the respondents are predominantly young, male, single, college-level educated production personnel with one to five years of manufacturing experience and moderate monthly earnings, making them suitable participants for the study.

Table 1.1
Profile of the Respondents

Profile and Category	f	%
Age		
20 years old and below	6	2.9
21–30 years old	110	52.4
31–40 years old	63	30.0
41–50 years old	29	13.7
51 years old and above	2	1.0
Total	210	100.0
Sex		
Male	126	60.0
Female	84	40.0
Total	210	100.0
Civil Status		
Single	104	49.5
Married	78	37.1
Legally Separated	23	11.0
Widowed	5	2.4
Total	210	100.0
Educational Attainment		
High School Undergraduate	12	5.7
High School Graduate	28	13.3
College Undergraduate	100	47.6
College Graduate	66	31.5
Postgraduate (Master's/Doctorate)	4	1.9
Total	210	100.0
Job Position		
Operations Manager	3	1.4
Production Manager	7	3.3
Production Staff	112	53.3
Factory Workers	61	29.1
Others	27	12.9
Total	210	100.0
Years in Manufacturing Companies		
Below a year	35	16.7
1–5 years	116	55.2
6–10 years	34	16.2
Over 10 years	25	11.9
Total	210	100.0
Average Monthly Income		
₱20,000 and below	88	41.9
₱20,001–₱30,000	91	43.3
₱30,001–₱40,000	22	10.5
₱40,001–₱50,000	9	4.3
Total	210	100.0

Table 1.2. below presents the frequency and percentage distribution of the business profile of the ten (10) manufacturing companies included in the study. The findings reveal that the majority of the firms have been operating for 16–20 years (50.0%), indicating that the respondents represent well-established manufacturing companies with considerable industry experience. Most businesses started with an initial capital of ₱1,000,001–₱2,000,000 (60.0%), suggesting that the firms are primarily medium-scale enterprises requiring substantial capital investment. In terms of sources of capital, bank loans (50.0%) were the primary financing source, followed by investors (30.0%) and personal savings (20.0%), highlighting the importance of external financing in establishing manufacturing businesses. Regarding average monthly profit, the majority

of companies earned ₱1,500,001–₱2,000,000 (60.0%), reflecting stable financial performance. As to the types of products produced, sweet and baked goods (30.0%) comprised the largest category, followed by fresh produce and frozen goods (20.0% each), indicating that food manufacturing dominates the participating firms. Moreover, most companies have been implementing sustainable manufacturing practices for 6–10 years (60.0%), demonstrating that sustainability initiatives have become an established part of their operations. Lastly, the majority of firms employed below 1,000 workers (70.0%), showing that the respondents are predominantly small- to medium-sized manufacturing enterprises. Overall, the business profile indicates that the participating companies are established, medium-scale manufacturers with stable operations, moderate profitability, growing commitment to sustainability, and workforce sizes typical of small- and medium-sized enterprises.

Table 1.2
Profile of the Business

Business Profile	f	%
Years in Business Operation		
10 years and below	1	10.0
11–15 years	3	30.0
16–20 years	5	50.0
21 years and above	1	10.0
Total	10	100.0
Initial Capital		
₱1,000,000 and below	1	10.0
₱1,000,001–₱2,000,000	6	60.0
₱2,000,001–₱3,000,000	2	20.0
₱3,000,001 and above	1	10.0
Total	10	100.0
Sources of Capital		
Personal Savings	2	20.0
Bank Loans	5	50.0
Investors	3	30.0
Total	10	100.0
Average Profit per Month		
₱1,000,000 and below	1	10.0
₱1,000,001–₱1,500,000	2	20.0
₱1,500,001–₱2,000,000	6	60.0
₱2,500,001 and above	1	10.0
Total	10	100.0
Types of Products Produced		
Fresh Produce	2	20.0
Canned Goods	1	10.0
Frozen Goods	2	20.0
Sweet and Baked Goods	3	30.0
Dairy Products	1	10.0
Bottled Beverages	1	10.0
Total	10	100.0
Years Engaging in Sustainable Manufacturing Practices		
5 years and below	1	10.0
6–10 years	6	60.0
11–15 years	3	30.0
Total	10	100.0
Number of Employees and Workers		
Below 1,000 employees	7	70.0
1,001–1,500 employees	3	30.0
Total	10	100.0

3.2 SDG12 Target Goals Practiced by Manufacturing Companies

Table 2 presents the SDG 12 Target Goals practiced by the ten (10) manufacturing companies in Taytay, Rizal. The findings show that SDG Target Goal 2 (Resource Efficiency), Goal 3 (Food Waste Management), Goal 4 (Chemical Waste Management), Goal 5 (Reduce Waste Generation), Goal 6 (Adoption of Sustainable Practices), Goal 8 (Awareness of

Sustainable Development), and Goal 10 (Sustainable Tourism) were each practiced by all 10 companies (100%), indicating that these sustainability initiatives are fully integrated into the operations of the participating manufacturing firms. Meanwhile, Goal 7 (Public Procurement Practices) was practiced by 4 companies (40.0%), Goal 9 (Scientific and Technological Capacity) by 2 companies (20.0%), Goal 1 (10-Year Framework Program) by 2 companies (20.0%), and Goal 11 (Phasing-out Harmful Subsidies and Practices) by only 1 company (10.0%), making these the least implemented SDG 12 targets. At the company level, Company 2 demonstrated the highest level of SDG 12 implementation, practicing 11 out of the 11 target goals, followed by Company 5 with 9 target goals, while Companies 3, 7, and 10 each implemented 8 target goals. Companies 1, 4, 6, 8, and 9 each practiced 7 target goals. Overall, the results indicate that manufacturing companies in Taytay, Rizal have widely adopted operational sustainability practices related to resource efficiency, waste management, and sustainable production. However, initiatives involving long-term sustainability frameworks, technological innovation, sustainable procurement, and policy-related practices remain less commonly implemented, suggesting opportunities for further enhancement in achieving the full scope of Sustainable Development Goal 12.

Table 2
SDG12 Target Goals Practiced by Manufacturing Companies

	SDG 12 Target Goals											
	1	2	3	4	5	6	7	8	9	10	11	TOTAL
Company 1		✓	✓	✓	✓	✓		✓		✓		7
Company 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
Company 3		✓	✓	✓	✓	✓	✓	✓		✓		8
Company 4		✓	✓	✓	✓	✓		✓		✓		7
Company 5		✓	✓	✓	✓	✓	✓	✓	✓			9
Company 6		✓	✓	✓	✓	✓		✓		✓		7
Company 7	✓	✓	✓	✓	✓	✓		✓		✓		8
Company 8		✓	✓	✓	✓	✓		✓		✓		7
Company 9		✓	✓	✓	✓	✓		✓		✓		7
Company 10		✓	✓	✓	✓	✓	✓	✓		✓		8
TOTAL	2	10	10	10	10	10	4	10	2	10	1	

Legend: **SDG 12 Goals:** (1) 10 Year Framework Program; (2) Resource Efficiency; (3) Food Waste Management; (4) Chemical Waste Management; (5) Reduce Waste Generation; (6) Adoption of Sustainable Practices; (7) Public Procurement Practices; (8) Awareness of Sustainable Development; (9) Scientific and Technological Capacity; (10) Sustainable Tourism; and (11) Phasing-out Harmful Subsidies & Practices

3.3 Respondents Assessment on the SDG 12 Responsible Consumption and Production of Manufacturing Companies in Taytay, Rizal

The overall assessment yielded a grand mean of 3.65, interpreted as Often Practiced, indicating that food and beverage manufacturing companies in Taytay, Rizal have generally integrated Sustainable Development Goal 12 (SDG 12) into their operations. Among the indicators, Sustainable Tourism obtained the highest mean of 4.29, followed by Awareness of Sustainable Development with 4.23, both interpreted as Always Practiced. Meanwhile, Food Waste Management with 4.09, Resource Efficiency with 4.06, Adoption of Sustainable Practices with 4.03, Reduce Waste Generation with 4.01, Chemical Waste Management with 3.78, and Public Procurement with 3.41 were all assessed as Often Practiced. In contrast, Phasing Out Harmful Subsidies with 3.01 was Sometimes Practiced, while the Scientific and Technology Capacity with 2.77 and the 10-Year Framework Programme with 2.48 were Rarely Practiced. Overall, the findings suggest that although the participating manufacturing companies have adopted most SDG 12 practices, greater efforts are needed to strengthen long-term sustainability frameworks, technological innovation, and policy-related initiatives to achieve more comprehensive implementation of responsible consumption and production.

Table 3
S Respondents Assessment on the SDG 12 Responsible Consumption and Production of Manufacturing Companies in Taytay, Rizal

SDG 12 Indicator	Mean	Verbal Interpretation
10-Year Framework Programme	2.48	Rarely Practiced
Resource Efficiency	4.06	Often Practiced
Food Waste Management	4.09	Often Practiced
Chemical Waste Management	3.78	Often Practiced
Reduce Waste Generation	4.01	Often Practiced
Adoption of Sustainable Practices	4.03	Often Practiced
Public Procurement	3.41	Often Practiced
Awareness of Sustainable Development	4.23	Always Practiced
Scientific and Technology Capacity	2.77	Rarely Practiced

Sustainable Tourism	4.29	Always Practiced
Phasing Out Harmful Subsidies	3.01	Sometimes Practiced
Grand Mean	3.65	Often Practiced

3.4 SDG 12 Responsible Consumption and Production of Manufacturing Companies in Taytay Rizal according to the two groups of respondents

Table 4 presents the relationship between workforce management planning practices and employee commitment, including continuance, affective, and normative commitment, as well as perceived employee attrition in construction companies. The results indicate that all major workforce planning components, particularly HR strategies and interventions, are significantly associated with employee commitment, while demand forecasting, gap identification, and monitoring and evaluation show stronger relationships with affective and normative commitment than with continuance commitment. This suggests that workforce management practices primarily strengthen employees' emotional attachment and moral responsibility rather than purely economic reasons for staying. Overall, the findings imply that effective workforce management planning enhances employee commitment by fostering organizational support, clarity, and stability, which may reduce turnover intentions, and these results are consistent with Boxall and Purcell (2016) and Noe et al. (2021), who emphasized that structured HR systems and strategic workforce planning significantly improve employee attitudes, engagement, and retention outcomes.

Table 4

SDG 12 Responsible Consumption and Production of Manufacturing Companies in Taytay Rizal according to the two groups of respondents

SDG 12 Indicator	Managers	Interpretation	Staff	Interpretation
10-Year Framework Programme	2.72	Sometimes Practiced	2.47	Rarely Practiced
Resource Efficiency	4.48	Always Practiced	4.04	Often Practiced
Food Waste Management	4.48	Always Practiced	4.07	Often Practiced
Chemical Waste Management	4.26	Always Practiced	3.75	Often Practiced
Reduce Waste Generation	4.60	Always Practiced	3.98	Often Practiced
Adoption of Sustainable Practices	4.62	Always Practiced	4.00	Often Practiced
Public Procurement Practices	3.64	Often Practiced	3.40	Often Practiced
Awareness of Sustainable Development	4.48	Always Practiced	4.22	Always Practiced
Scientific and Technological Capacity	2.86	Sometimes Practiced	2.76	Sometimes Practiced
Sustainable Tourism	4.70	Always Practiced	4.27	Always Practiced
Phasing-out Harmful Subsidies and Practices	3.18	Sometimes Practiced	3.00	Sometimes Practiced
Grand Mean	4.00	Often Practiced	3.63	Often Practiced

3.5 Test of Significant Difference in the Respondents' Assessment of SDG 12 Responsible Consumption and Production According to Respondent Group

The results indicate that there was no significant difference in the overall assessment of Sustainable Development Goal 12 (SDG 12) Responsible Consumption and Production between managers and staff, as reflected by the grand mean significance value of 0.656, which is greater than the 0.05 level of significance. This implies that both groups generally shared similar perceptions regarding the implementation of SDG 12 practices in their respective manufacturing companies. Likewise, no significant differences were found in the assessment of the 10-Year Framework Programme, Resource Efficiency, Food Waste Management, Chemical Waste Management, Adoption of Sustainable Practices, Public Procurement, Awareness of Sustainable Development, Scientific and Technological Capacity, and Sustainable Tourism, indicating consistency in the views of managers and staff across these dimensions. However, significant differences were observed in Reduce Waste Generation with a significance value of 0.040 and Phasing Out Harmful Subsidies with a significance value of 0.009, suggesting that managers and staff differed in their perceptions of these specific sustainability practices. These findings imply that while the overall implementation of SDG 12 is perceived similarly across respondent groups, greater alignment may be needed in communicating and implementing waste reduction initiatives and policies related to harmful subsidies.

Table 5

Test of Significant Difference in the Respondents' Assessment of SDG 12 Responsible Consumption and Production According to Respondent Group

SDG 12 Indicator	F	Sig.	Decision on H ₀	Verbal Interpretation
10-Year Framework Programme	5.230	0.023	Fail to Reject	Not Significant
Resource Efficiency	0.600	0.440	Fail to Reject	Not Significant

Food Waste Management	0.119	0.731	Fail to Reject	Not Significant
Chemical Waste Management	0.532	0.466	Fail to Reject	Not Significant
Reduce Waste Generation	4.292	0.040	Reject	Significant
Adoption of Sustainable Practices	0.981	0.323	Fail to Reject	Not Significant
Public Procurement	0.159	0.690	Fail to Reject	Not Significant
Awareness of Sustainable Development	0.114	0.736	Fail to Reject	Not Significant
Scientific and Technological Capacity	0.176	0.675	Fail to Reject	Not Significant
Sustainable Tourism	2.033	0.155	Fail to Reject	Not Significant
Phasing Out Harmful Subsidies	7.049	0.009	Reject	Significant
Overall (Grand Mean)	0.199	0.656	Fail to Reject	Not Significant

3.6. Significant Differences in the Assessment of SDG 12 Responsible Consumption and Production According to the Respondents' Profile

The results indicate that job position and average monthly income were the only respondent profile variables that exhibited a significant overall difference in the assessment of Sustainable Development Goal 12 (SDG 12) Responsible Consumption and Production, with overall p-values of 0.021 and 0.008, respectively. This suggests that respondents' organizational roles and income levels significantly influenced their perceptions of SDG 12 implementation. In contrast, age, sex, civil status, educational attainment, and years in manufacturing companies showed no significant overall differences, as their overall p-values were greater than the 0.05 level of significance, indicating generally consistent perceptions across these demographic groups. Nevertheless, several specific SDG 12 indicators demonstrated significant differences within these profile variables, particularly in Public Procurement, Awareness of Sustainable Development, Scientific and Technological Capacity, and Phasing Out Harmful Subsidies, implying that while respondents shared similar overall views on sustainability practices, certain dimensions of SDG 12 were perceived differently depending on selected demographic and employment characteristics.

Table 6.1

. Significant Differences in the Assessment of SDG 12 Responsible Consumption and Production According to the Respondents' Profile

Respondents' Profile	Overall p-value	Overall Interpretation	SDG 12 Indicator(s) with Significant Difference (p-value)
Age	0.146	Not Significant	Public Procurement (0.004); Awareness of Sustainable Development (0.035); Phasing Out Harmful Subsidies (0.009)
Sex	0.215	Not Significant	Public Procurement (0.050); Phasing Out Harmful Subsidies (0.049)
Civil Status	0.159	Not Significant	Scientific and Technological Capacity (0.000)
Educational Attainment	0.822	Not Significant	Scientific and Technological Capacity (0.003); Phasing Out Harmful Subsidies (0.007)
Job Position	0.021	Significant	Resource Efficiency (0.079*); Chemical Waste Management (0.019); Public Procurement (0.035); Scientific and Technological Capacity (0.028)
Years in Manufacturing Companies	0.419	Not Significant	Public Procurement (0.010); Awareness of Sustainable Development (0.000); Sustainable Tourism (0.043); Phasing Out Harmful Subsidies (0.000)
Average Monthly Income	0.008	Significant	10-Year Framework Programme (0.069*); Chemical Waste Management (0.027); Adoption of Sustainable Practices (0.094*); Public Procurement (0.010); Awareness of Sustainable Development (0.044); Scientific and Technological Capacity (0.030); Phasing Out Harmful Subsidies (0.000)

Table 6.2. findings below revealed that sources of capital, years engaging in sustainable practices, and number of employees exhibited significant overall differences in the assessment of Sustainable Development Goal 12 (SDG 12) Responsible Consumption and Production, with overall p-values of 0.037, 0.009, and 0.017, respectively. This indicates that these business characteristics significantly influenced the implementation of sustainability practices among the participating manufacturing companies. In contrast, years in business operation, initial capital, average profit per month, and types of products manufactured did not show significant overall differences, as their p-values exceeded the 0.05 level of significance, suggesting relatively similar sustainability assessments across these business profiles. Nevertheless, several specific SDG 12 indicators, particularly Resource Efficiency, Food Waste Management, Chemical Waste Management, Reduce Waste Generation, Adoption of Sustainable Practices, Awareness of Sustainable Development, and Sustainable Tourism, demonstrated significant differences within selected business profile variables, implying that financial resources, organizational experience in sustainability, and workforce size contribute to variations in the implementation of responsible consumption and production practices.

Table 6.2

. Significant Differences in the Assessment of SDG 12 Responsible Consumption and Production According to the Business Profile

Business Profile Variable	Overall p-value	Decision	Interpretation
Years in Business Operation	0.410	Fail to Reject H ₀	Not Significant
Initial Capital	0.809	Fail to Reject H ₀	Not Significant
Sources of Capital	0.037	Reject H₀	Significant
Average Profit per Month	0.254	Fail to Reject H ₀	Not Significant
Types of Product Manufactured	0.051	Fail to Reject H ₀	Not Significant
Years Engaging in Sustainable Practices	0.009	Reject H₀	Significant
Number of Employees	0.017	Reject H₀	Significant

Conclusions & Recommendations

The study concluded that food and beverage manufacturing companies in Taytay, Rizal generally often practiced Sustainable Development Goal 12 (SDG 12) on Responsible Consumption and Production, demonstrating a commitment to sustainable manufacturing practices. The highest levels of implementation were observed in sustainable tourism, awareness of sustainable development, food waste management, resource efficiency, and the adoption of sustainable practices, while the 10-Year Framework Programme, scientific and technological capacity, and phasing out harmful subsidies received comparatively lower assessments. Moreover, job position, average monthly income, sources of capital, years of engaging in sustainable practices, and number of employees significantly influenced the respondents' assessment of SDG 12 implementation. Based on these findings, an SDG 12 Compliance Model was developed to strengthen sustainability practices among manufacturing companies.

Manufacturing companies are encouraged to adopt and institutionalize the proposed SDG 12 Compliance Model by strengthening long-term sustainability planning, investing in scientific and technological innovations, improving resource efficiency and waste management systems, and enhancing employee capacity through continuous sustainability training. Likewise, local government units, the Department of Environment and Natural Resources (DENR), the Department of Trade and Industry (DTI), academic institutions, and other stakeholders should collaborate in providing policy support, technical assistance, financial incentives, and capacity-building programs to promote responsible consumption and production. Future researchers are encouraged to validate the proposed model in other manufacturing sectors and geographic locations and to incorporate objective environmental performance indicators and longitudinal research designs to further enrich the body of knowledge on sustainable manufacturing..

Compliance with ethical standards

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