Profitability and Sustainability of Vermi Composting Business toward Social Entrepreneurship in Negros Oriental, Philippines

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Abstract – *This study aims to determine the profitability and sustainability of vermicomposting business towards social entrepreneurship. Vermicomposting businesses which gained profit and sustained for at least five years were covered in the study. Personal interview and observations were undertaken with net profit margin, return on assets and investment, mean, weighted mean, fixed asset turnover ratio, ordinary least square, and correlation were utilized. Findings revealed that vermicomposting businesses were dominated by family enterprises and generated employment. The average net profit of sampled businesses was ₱921,784, average net profit margin of 74.59 percent; average return on assets of 179.06 percent; average return on investment of 83.00 percent. This higher profitability was attributed by satisfaction in growth both in business and personal income; increased customers; assessed customers' satisfaction; initiated changes to overcome competition; enhanced employees' competencies thru trainings; and kept organization's best people. Said businesses had average fixed asset turnover ratio of 461.19 percent and projected to increase sales from ₱1,951,516 to ₱2,253,686 by 2024. This higher sustainability was due to improved employees' standard of living; reduced pollution; absence of complaints regarding the project; and positive feedback regarding soil fertility. Type of customers had correlation of 0.984 with profitability and 0.973 with sustainability while profitability had correlation of .800 with sustainability. The study concludes that application of frictional, innovations, risk and uncertainty bearing, and managerial efficiency theory of profits result to higher profitability whereas, higher sustainability is attributed by practice of social entrepreneurship with emphasis on economic, social and environmental contributions (Sustainability Theory).*

Keywords – *Profitability, social entrepreneurship, sustainability, vermicomposting business*

INTRODUCTION

Vermicomposting provides lots of benefits to the environment. Its process produces compost by utilizing earthworms to turn the organic waste into high-quality compost that consists mainly of worm cast in addition to decayed organic matter [1]. It is an organic fertilizer rich in NPK, micronutrients and beneficial soil microbes, a sustainable alternative to chemical fertilizers, which is an excellent growth promoter and protector for crop plants [2]. Today vermicompost is an important component of organic farming systems, because it is easy to prepare, has excellent properties and is harmless to plants. Because of the many benefits given by vermicomposting, it becomes an industry where many are already into business.

Vermicompost industry is much fragmented, companies were mostly in the India and Southeast Asia. Its market managed to increase sales by 24.89% to 38.09 M USD worldwide in 2015. Overall, the Vermicompost performance is positive, despite the weak economic environment [3].

In the Philippines, there are more than 200,000 stakeholders in the industry with an estimated value of P500M. The National Vermicompost Production Program (2006-07) - funded by the NEDA with P17.5 M – was conducted by State Colleges and Universities in 16 regions, coordinated by PCAMRD-DOST [4]. The country has 84 organic fertilizer trading posts which were operated by the cooperatives, associations and local government units. The vermicomposting project which jointly funded with P400,000 by the Mindanao Rural Development Program (MRDP) of the Department of Agriculture and the provincial government of North Cotabato. Now, they have local and national buyers coming from different towns in North Cotabato and provinces in the Soccsksargen region as well as from the Visayas and Luzon [5].

The local governments of Negros Oriental and Occidental signed a memorandum of agreement to

work together and turn the island into the "Organic Food Bowl of Asia." Since then, the provinces have produced 10,000 hectares of organic land, serving as the benchmark for the rest of the country to follow suit [6]. This agreement supported the Organic Agriculture Act of 2010 [7].

Profitability is a situation in which an entity is generating a profit. It arises when the aggregate amount of revenue is greater than the aggregate amount of expenses in a reporting period [8]. According to the Central Bank of Sri Lanka, the Cottage and Small Scale Industries (CSSI) sector plays an important role in economic development through creation of employment opportunities, the mobilization of domestic savings, poverty alleviation, income distribution, regional development, training of workers and entrepreneurs, creating an economic environment in which large firms flourish and contribute to export earnings [9].

At some point, most businesses require an in-depth look at their financial structure by looking closely at the financial ratios. They reveal very basic information such as whether too much debt have accumulated, stockpiled too much inventory or are not collecting receivables fast enough [10].

Meanwhile, sustainability is the capacity to endure in a relatively ongoing way across various domains of life. It has also been described as "meeting the needs of the present generation without compromising the ability of future generations to meet their needs" [11]. Being part of sustainability, social entrepreneurship is the most important criteria for ''qualifying'' as a social venture in establishing the organization to create a certain social impact and measure the success of the organization based on the achievement of this social impact [12].

Vermicomposting is a profitable business as proven by Thiripurasundari and Divya [13] with net return per ton of Rs.1180 and the cost of production and marketing were reasonable for the producers. High profitability is even concluded by Ceyhan [14] while the likelihood of loss was less. It yielded better net profit of Rs. 9.32 per kg. and for the financial viability. Devkota, et.al., [15] also concludes that vermicompost production is feasible enterprise for the economic life of five years with respect to discounted Benefit Cost Ratio (B: C) 1.55, and Internal Rate of Return (IRR) 65 %.They further conclude that direct marketing of said product from producer to consumer was found to be the strongest marketing channel. In many cases, vermicast production improved farmers' socioeconomic status, while the most innovative among them earned $750 to $1,500 per year from sales. Moreover, Bajracharya and Lakhe [16] conclude from their study that higher internal rate of return was due to the use of home available organic wastes and other resources; due to short duration of the enterprise to produce final output i.e. vermicompost gets ready within 40 to 45 days and due to low initial investment.

Regarding the use of raw materials for vermicomposting, the study of Kumar, et. al. [17] comment that vermicompost using animal manure and organic wastes is much useful for soil health. Earthworm promotes soil fragmentation and increase aeration of soil by volume 8-30 per cent. It is also good when combined with other organic fertilizers according to Sinha et al. [18] who conclude that growths of crop plants are enhanced by 30–40% higher over the chemical fertilizers with highly reduced incidences of pests & diseases. Nutritive values of the Grains, Fruits & Vegetables grown on Vermicompost also increase. Rekha, et. al. [19] confirm the benefits of vermicomposting where 50% vermicompost treatment showed great potential to increase the performance, growth of chilly plant and improvement of soil quality. Thus, vermicompost may be put to good use as a natural fertilizer for cereals and vegetable crops for increased production and for sustainable agricultural systems.

Regarding the use of raw materials for vermicomposting, Vijay [20] concludes that good quality organic fertilizer from animal waste provides an opportunity for the agricultural sector to reduce their reliance on chemical fertilizer which improves the soil fertility and sustainability. The use of animal waste as input for bio-energy conversion processes can allow farmers to take advantage of new markets for waste products. Proper utilization of cow dung and cow urine into manure, pesticides, medicines and other daily products can generate millions of employment opportunities in rural areas as well it can protect soil from chemicals and fertilizers and improve soil fertility. In many cases, vermicast production improved farmers' socioeconomic status, while the most innovative among them earned $750 to $1,500 per year from sales [21].

With respect to Social Sustainable Entrepreneurship, Purkayastha [22] concludes that community engaging in micro-enterprises based on vermicomposting and vermiculture have been proven to be working successfully once implemented. Vermicomposting does not only help reduce the

problems of chemical fertilizers which are dangerous to soils, crops and human health, but also may serve as business opportunity for rural poor.

Vermicompost is a feasible alternative to increase farm income. Alarmingly, only few consider it for business. Furthermore, research and situational analysis in operation and marketing of vermicompost fertilizer in the province are insufficient. Though the sale of organic fertilizer is evident, the commercialization aspect still needs some information particularly in profitability and sustainability. Thus, this study is conceptualized to further know the relationships that exist between the profile of the vermicomposting businesses and its profitability as well as business sustainability. The result of this study can be a reliable basis to recommend to the vermicomposting entrepreneurs some significant factors that can help them improve the business especially their contribution to reduce environmental problems and produce healthy food.

This study was anchored on the Dynamic (Frictional) Theory of Profits, Innovations Theory of Profits, Uncertainty Bearing Theory of Profits and Managerial Efficiency Theory of Profits, Social Entrepreneurship Theory and Sustainability Theory [23]. According to Dynamic (Frictional) Theory of Profits, there exists a normal rate of profit which is a return on capital that must be paid to the owners of capital as a reward for saving and investment of their funds. Economic profits exist for some time because of frictional factors which prevent an instantaneous adjustment of the system to the new conditions.

It has been held in Innovations Theory of Profits that the main function of the entrepreneur is to introduce innovations in the economy and profits are reward for his performing this function.

Risk and Uncertainty Bearing Theory of Profits explains that profits are necessary rewards of the entrepreneur for bearing risk and uncertainty in a changing economy. Profits arise as a result on uncertainty of future.. In advance entrepreneurs have to make estimates of the future conditions regarding demand for the product and other factors which affect price and costs.

Managerial Efficiency Theory of Profits recognizes that some firms are more efficient than others in terms of management of productive operations and successfully meet the needs of consumers.

Sustainability Theory [24] attempts to prioritize and integrate social responses to environmental and cultural problems. An economic model looks to sustain natural and financial capital; an ecological model looks to biological diversity and ecological integrity; a political model looks to social systems that realize human dignity. El Ebrashi [12] cites that the most important criteria for ‘‘qualifying’’ as a social venture is establishing the organization to create a certain social impact and measure the success of the organization based on the achievement of this social impact. Social ventures do not focus on outputs, or in other words, service provision. Social entrepreneurs create sustainable change and they measure the success of their organizations based on the creation of this change.

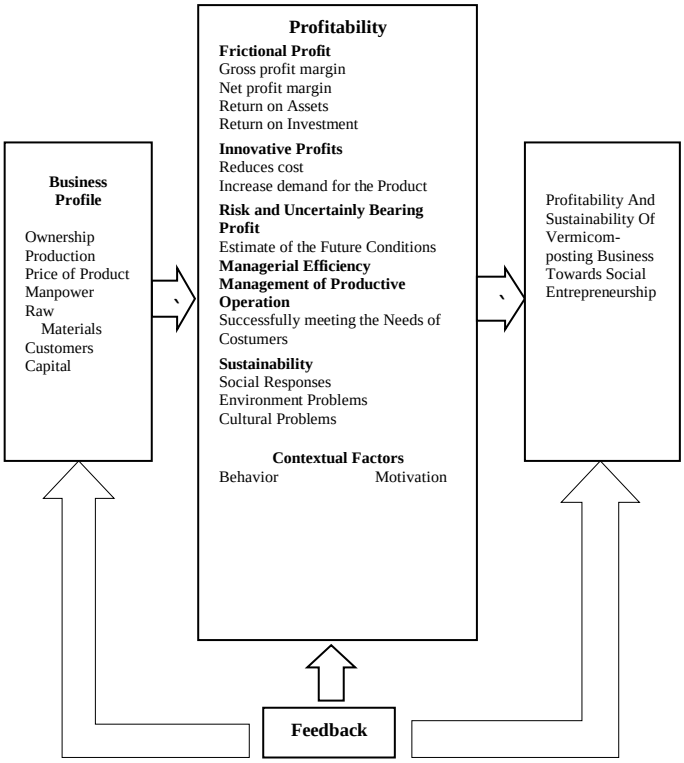

Figure 1. The Paradigm Showing the Theoretical Framework

Figure 1 presents the schematic diagram showing the interrelationship of the various independent, intervening and dependent variables of the study. Such interaction of the aforementioned interlinking variables would lead to the successful attainment of the productive economic ventures toward social entrepreneurship as its main object of the study.

The conceptual diagram looks into the interrelatedness of the forestalled variables of the study as portrayed through a logical and abstract schematic diagram that strictly follows a sequential process. The said process is obviously seen in the forward direction

of the arrows and the feedback loop that link or connect with the different variables in order to achieve its social impact towards social entrepreneurship.

OBJECTIVES OF THE STUDY

This study sought to determine the profitability and sustainability of vermicomposting business towards Social Entrepreneurship in Negros Oriental. Specifically, it determines the profile of the Vermicomposting Business in terms of Type of Ownership, Average Number of bags of Vermicompost produced per month, Price of Vermicompost per bag of 50 kgs, Number of Employees, Raw material used in vermicomposting, Type of customers and Capital. It also sought to determine the status of the vermicomposting business, the extent of profitability of the business for the last five years, extent of sustainability of the business for the last and next five years up to 2024. Moreover, it determined the relationship between profile of the business, extent of profitability and extent of sustainability.

MATERIALS AND METHODS

Personal Interview using the researcher made questionnaire and personal observations of the vermicomposting projects were done to have a clearer picture of the projects under study. The researcher's made questionnaire was tested reliable with Cronbach's Alpha of 0.81.

Net Profit was used to determine the return received and Net Profit Margin to calculate the percentage of profit a company produces from its total revenue [25]. Return on Assets (ROA) Ratio was used to tell how well management is utilizing the company's various resources and the Return on Investment to determine the ratio of a profit or loss made in a fiscal year expressed in terms of an investment [26],[27]. The qualitative responses in the extent of profitability and sustainability of vermicomposting business were interpreted using the Weighted Mean [28].

Fixed Asset Turnover (FAT) Ratio was used to determine how well or efficiently the business uses fixed assets to generate sales and the Ordinary Least Squares (OLS) Regression to determine the future sales of the sampled vermicomposting business [29]-[30].

Spearman Rank Correlation was used in determining the relationship between the profile of the vermicomposting business with scale variables and the extent of profitability and sustainability in vermicomposting. This was also used in determining the relationship between profitability and sustainability [31]-[32].

Eta Correlation was used in determining the relationship between profile with nominal variables and the Extent of Profitability and Sustainability [33].

RESULTS AND DISCUSSION

Profile of Vermicomposting Business

Only 13 vermicomposting sustainable businesses were identified in the entire province of Negros Oriental.

Table 1. Profile of Respondents

Basis of Classification and Category	f	%	Basis of Classification and Category	f	%
Type of Ownership			**Raw Materials Used**		
Family Enterprises	7	53.85	Animal manure	10	37.04
Educational Institutions	2	15.38	Crop by Product	5	18.52
Cooperative/Associations	2	15.38	Industrial by Product	7	25.92
Local Government Units	2	15.38	Grass/Dry Leaves	3	11.11
Vermicompost Produced Per Month			Biodegradable Waste	2	7.41
Sold	4,551	74.06	**Type of Customers**		
Used for the Farm	1,594	25.94	Farmers	11	39.28
Number of Workers			Business Enterprise	6	21.43
1 - 3	3	23.08	Government Institutions	5	17.86
4 - 6	5	38.46	Cooperative/Association	4	14.29
7 - 9	2	15.38	Students	2	7.14
10-12	3	23.08			

Most of the vermicomposting business were owned and managed by family enterprises where a number of them employed 4-6 workers. Majority of their produce were sold at PHP125 to PHP249 per bag. Majority of the raw materials used were animal manure and industrial by product and more of their customers were farmers. The findings above relate with the study of Vijay [20] which concluded that good quality organic fertilizer from animal waste provides an opportunity for the agricultural sector to reduce their reliance on chemical fertilizer which improves the soil fertility and sustainability and is much useful for soil health as concluded by Kumar, et. al. [17].

Status of the Vermicomposting Business

To have a clearer picture on the financial performance of vermicomposting business in the province, 60 percent of the respondents were interviewed regarding the financial status of their business to determine the profitability of their businesses.

Table 2. The capital, income (before tax), and profitability ratios

	Capital (PHP)	Income (Before Tax) (PHP)	Profitability Ratios (%)		
			Net Profit Margin	Return on Assets	Return on Investment
Mean	406,966	921,784	74.57	317.32	83.00
Minimum	20,705	-679,504	943.76	70.95	-39.76
Maximum	957,090	10,939,340	93.73	2,151.30	395.04

The sampled vermicomposting business have mean capital of almost half million and generated more than double of their income (before tax) as compared to their capital. The net profit margin had reached PHP 0.75 in per peso revenue gained and a peso in asset have a return of PHP 1.79 on assets and generate PHP0.83 return for every peso of their investment. The figures indicate that the generation higher income and net profit margin is through the better utilization of their assets and return on investment.

The findings agree with the study of Thiripurasundari and Divya [13] which proved that vermicomposting is a profitable business with net return per ton of Rs.1180 and the cost of production and marketing was reasonable for the producers; with the study of Bajracharya and Lakhe [16] which concluded that higher internal rate of return was due to the use of home available organic wastes and other resources, short duration of the enterprise to produce final output and due to low initial investment. It also confirms with the study of Ceyhan [14] which shows that the profitability of vermicompost production facility was high with the internal rate of vermicompost production facility was 23%. Being a diversified business, no liabilities were incurred because they were primarily in the major business such as the cattle fattening, cattle dairy production and non-livestock businesses.

Extent of Profitability of the Business for the Past Five Years

The indicators utilized for the extent of profitability were the achievement of goals, the improvement of life standard, growth of business, market coverage, customers, collaborations with other entities and competency of workers.

Table 3. Extent of profitability of the business for the past five years

Indicators	WM	Description
Satisfaction in Business Growth including Achievement of Business Goal	4.15	Higher Extent
Improvement in Life Standard after longer period in the business	3.69	Higher Extent
Growth in Personal Income from the beginning of business	4.08	Higher Extent
Improvement in saving capacity and accumulation of resources from the business	3.85	Higher Extent
Growth in turnover over the past five years	3.85	Higher Extent
Enhancement of market coverage of business enterprises	3.54	Higher Extent
Increasing the number of customers from the beginning of Business	4.08	Higher Extent
Overcoming the actions of the competitors over the past 5 years	4.08	Higher Extent
Achievement at business growth by facing the environmental challenge & strong competition	3.69	Higher Extent
Organization enhance organizational performance by being attentive to external changes	3.77	Higher Extent
Engaging in partnership with other companies/organizations for the cause	2.92	Moderate Extent
Enhancement of employees' competencies by conducting updated trainings	4.08	Higher Extent
Composite	3.82	Higher Extent

Legend: Range Description
4.21 - 5.00 Highest Extent 2.61–3.40 Moderate Extent 1.00 -1.80 Least Extent
3.41 – 4.20 Higher Extent 1.81 – 2.60 Lesser Extent

Table 3 presents that the respondents perceived that the Extent of Profitability of their vermicomposting businesses were Higher. The respondents' perception confirms with better Return on Investment as cited in problem 2 of this study. Satisfaction in business growth including achievement of business goal, growth in personal income from the beginning of business supported the Dynamic (Frictional) Theory of Profit [23] which explains that there exists a normal rate of profit which is a return on capital that must be paid to the owners of capital as a reward for saving and investment of their fund.

Increasing the number of customers, conducted survey measuring satisfaction of the customers and carry out the necessary changes were in confirmation with the Innovations Theory of Profit [23] which explained that economic profits arise because of successful innovations introduced by the entrepreneurs. They also corroborate with the study of Vermani [21] which commented that in many cases, vermicast production improved farmers' socioeconomic status, while the most innovative among them earned $750 to $1,500 per year from sales.

Overcoming the actions of the competitors agree with the Risk and Uncertainty Bearing Theory of Profits [23] which explain that profits were necessary rewards of the entrepreneur for bearing risk and uncertainty in a changing economy. Profits arise as a result of uncertainty of future. One of the vermicomposting business owners even hosted a radio program educating and encouraging farmers to use organic fertilizer.

Enhancing employees' competencies by conducting updated trainings and the ability of their business to keep the organization's best and most talented people were in the context of Managerial Efficiency Theory of Profit [23] which recognized that some firms were more efficient than others in terms of management of productive operations and successfully met the needs of consumers.

On the partnership with other companies/ organizations, a local government unit had the concern where the vermicompost fertilizer producer and the agency concerned for the use of said fertilizer lack collaboration that instead of buying the organic fertilizer in compliance to the organic Agriculture Act of 2010 by implementing the Organic Agriculture Ordinance in Negros Oriental, the concerned agency purchased chemical fertilizer for the farmer beneficiaries. A family enterprise owner also noticed that in the Philippine Government Electronics Procurement System (PhilGEPS), the procurement for organic fertilizer for 2020, was minimal as compared to the chemical fertilizer.

Extent of Sustainability of Vermicomposting Business for the Past Five Years

Extent of sustainability of vermicomposting projects covered the economic, social and environmental aspects with the extent of social entrepreneurship of vermicomposting projects can also be known.

Table 4 exhibits that the respondents perceived the sustainability of their vermicomposting business was at "Higher Extent" for the last five years. Impressively, they perceived that their business was in "Highest Extent" in reducing pollution.

Improved standard of living of employees confirms with the Social Entrepreneurship Theory [25] which studied the contextual factors which led to social venture creation and how these typologies measured social impact, mobilize resources, and bring about sustainable social change.

Table 4. Extent of sustainability of vermicomposting business for the last five years

Indicators	WM	Description
Capitalization for the business have improved for the past five years.	3.62	Higher Extent
Increasing in number of employees from the beginning of business	3.62	Higher Extent
Ability of the business to keep the organization's best and most talented people	3.69	Higher Extent
Standard of living of employees have improved	4.00	Higher Extent
Sufficient supply of raw materials for the business	4.31	Highest Extent
Level of customer satisfaction related to business activities	4.23	Highest Extent
Conducting survey to measure satisfaction of the customers and carry out the necessary changes	4.00	Higher Extent
Business contribution for the production of healthy crops.	4.31	Higher Extent
Income of customers have improved brought by the vermicompost they bought from the vermicomposting business	4.46	Highest Extent
Customers feedback on the improvement of soil fertility of their farm brought by the use of vermicast	4.54	Highest Extent
No complaint of neighbors regarding the vermicompost project	4.69	Highest Extent
Pollution is reduced brought by the vermicompost project	4.77	Highest Extent
Composite	4.19	Higher Extent

Legend: Range Description
4.21 - 5.00 Highest Extent 2.61–3.40 Moderate Extent 1.00 -1.80 Least Extent
3.41 – 4.20 Higher Extent 1.81 – 2.60 Lesser Extent

Business contribution in reducing pollution, absence of complaint regarding the vermicompost project, and customers positive feedback on the improvement of soil fertility of their farm brought by the use of vermicast attests with the Sustainability Theory [24] particularly the Ecological Models which proposed to sustain biological diversity and ecological integrity that prioritize and integrate social responses to environmental and cultural problems. Furthermore, this harmonizes with the study of Rekha, et. al. [19] which shows that 50% vermicompost treatment showed great potential to increase the performance, growth of chilly plant and improvement of soil quality.

Sustainability of Vermicomposting Business in the Last and Next Five Years up to 2024

Table 5. Fixed asset turnover ratio

	Average	Minimum	Maximum
Sales	1,876,875	12,000	13,200,000
Assets	406,966	20,705	957,690
Fixed Asset Turnover Ratio	461.19	7.52	2,595.87

The eight (8) vermicomposting samples had no external borrowings. Their borrowings were on their core businesses such as cattle fattening, cattle dairy project and others.

The table 5 presents the higher fixed asset ratio which implies more effective utilization of investments in fixed assets to generate revenue [20].

This higher fixed asset ratio was also attributed by the less requirement for building. One respondent even used the fully depreciated garage like building where some of his vermicomposting areas were placed under the trees. Besides vermicomposting was done with 1 meter height but the addition of substrate was done little by little. Same thing with the equipment where a screen was substituted with a mesh equipment. To reduce the cost in shredding some used fine raw materials such as mud press, saw dust in addition to their animal waste while others let decomposition to complete before vermicomposting.

Figure 2. Actual and Projected Sales

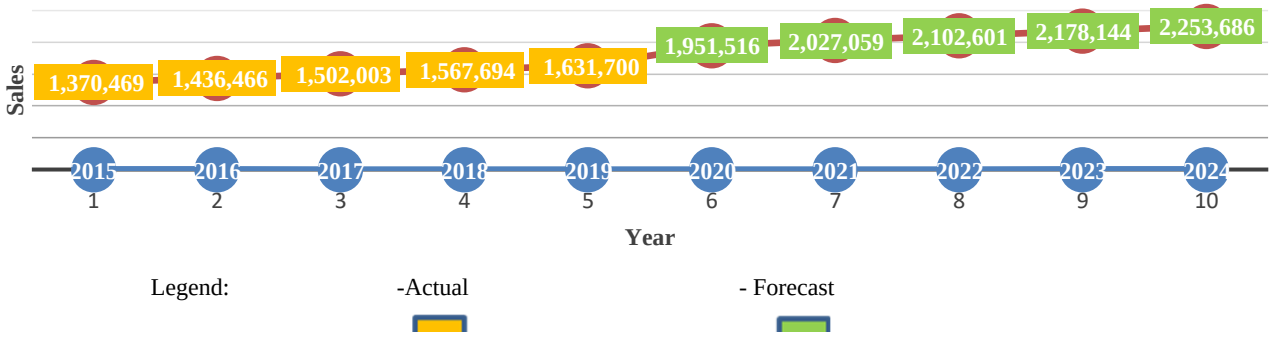

Figure 2 exhibits the continues increase in sales from 2015 to 2019 of vermicompost fertilizer and projected to continue increase from P1,951,516 in to P2,253,686 by 2024. The increase was attributed by the continuous increase of the production of the major producer of vermicompost and local government unit which were expected to increase due to the increase of biodegradable waste.

The findings agree with the study of Ceyhan [14] which concludes that the profitability of vermicompost production facility was high, while the likelihood of loss was less. This further conforms on the study of Devkota et al [15], which concluded that vermicompost production is a feasible enterprise from the financial viability and appropriate supply chain of organic waste and cow dung can attract people to produce vermicompost on a large scale.

Relationships Between Profile, Extent of Profitability and Extent of Sustainability

The correlation between profile of vermicomposting businesses and the extent of profitability were analyzed using Eta Correlation for Nominal Variables and Spearman Rho for Ratio Variables.

Table 6. Correlation between profile, extent of profitability and extent of sustainability

Correlated Variables	Correlation Value	Statistics	Strength of Association
Type of Ownership - Extent of Profitability	.116	Eta Correlation	Negligible Correlation
Raw Materials Used - Extent of Profitability	.240	Eta Correlation	Negligible Correlation
Type of Customers - Extent of Profitability	.984	Eta Correlation	Very High Correlation
Sold Per Month - Extent of Profitability	.326	Spearman Rho	Low Correlation
Used for Farm - Extent of Profitability	-.062	Spearman Rho	Negligible Correlation
Price Per Bag - Extent of Profitability	.355	Spearman Rho	Low Correlation
Number of Workers - Extent of Profitability	.039	Eta Correlation	Negligible Correlation
Type of Ownership - Extent of Sustainability	.227	Eta Correlation	Negligible Correlation
Raw Materials Used - Extent of Sustainability	.380	Eta Correlation	Low Correlation
Type of Customers - Extent of Sustainability	.973	Eta Correlation	Very High Correlation
Produced Per Month - Extent of Sustainability	.407	Spearman Rho	Low Correlation
Sold Per Month - Extent of Sustainability	.103	Spearman Rho	Negligible Correlation
Used for Farm - Extent of Sustainability	.059	Spearman Rho	Negligible Correlation
Price Per Bag - Extent of Sustainability	.378	Spearman Rho	Low Correlation
Number of Workers - Extent of Sustainability	-.179	Spearman Rho	Negligible Correlation
Extent of Profitability - Extent of Sustainability	.800	Spearman Rho	High Correlation

Type of Customers has very high Correlation with Extent of Profitability and Extent of Sustainability. This finding conforms with the study conducted by Devcota, et. al, [15] which concluded that direct marketing of vermicompost from producer to consumer was the strongest marketing. Thus, customers are very important for the sustainability of vermicomposting business specially that at present context demand for vermicompost is increasing and government is also giving subsidy which is appreciative.

Profitability is highly correlated with Sustainability. This confirms with the study of Kumar, et. al., [17] which concluded that vermicomposting is not only capable to replace chemical fertilizer rather offered business opportunity for rural poor. It is not only a powerful method of recycling the organic waste but it has potentiality for employment generation especially in rural areas.

CONCLUSION

The vermicomposting sustainable businesses were few, dominated by microenterprises managed by family entrepreneurs with most of their produce were disposed for commercial purposes and priced at a much lower amount as compared to chemical fertilizer. They contributed to the employment generation in the province with the concerned business generated capital with buildings as its major cost. Vermicomposting business was profitable and financially performed well particularly in the Return on Assets and Net Profit Margin. Profitability Theories such as Dynamic (Frictional) Theory, Innovations Theory of Profit, Risk and Uncertainty Bearing Theory of Profit, Managerial Efficiency Theory of Profit were applied in a higher level. The higher extent of sustainability of vermicomposting businesses in the province was attributed by the practice of Social Entrepreneurship as well as the economic, social and environmental contribution of the product (Sustainability Theory). The effective utilization of their investments in fixed assets to generate revenue enabled them to sustain their operation until 2024. Moreover, customers are significant for the profitability and sustainability in vermicomposting business.

RECOMMENDATION

The vermicomposting sustainable businesses were few, dominated by microenterprises managed by family entrepreneurs with most of their produce were disposed for commercial purposes and priced at a much lower amount as compared to chemical fertilizer.

1. Farmers and entrepreneurs having abundance of animal and crop bi-products may diversify their farming activities by utilizing their waste for vermicomposting.
2. Use vermicomposting project as Sustainable Livelihood Project grant for farmer beneficiaries.
3. Enhance use of vermicompost fertilizer as supplement of chemical fertilizer for grants and support to farmer beneficiaries, thus, help improve soil fertility.
4. The provincial governor of Negros Oriental may issue an Executive Order to enjoin all cities and municipalities, and private entrepreneurs to venture into vermicomposting to make the province a model where organic fertilizer is given primordial attention.

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