International Journal of Academic Management Science Research (IJAMSR)
ISSN: 2643-900X
Vol. 9 Issue 6 June - 2025, Pages: 13-18

Analyzing Usage Rate Segmentation to Enhance the Operational Sustainability of Farmers in Candaba, Pampanga

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Abstract: *This study aims to investigate how Usage Rate Segmentation can enhance Operational Sustainability of Farmers within Candaba, Pampanga. By identifying key factors that optimize resource allocation, this research seeks to offer practical recommendations to enhance productivity while ensuring long-term sustainability in the region. The researcher will employ descriptive-correlational research to examine how usage rate segmentation influences operational sustainability among farmers in Candaba, Pampanga. The descriptive component will provide a detailed overview of farmers' segmentation based on their usage rates, while the correlational aspect will assess the association between these segmentation patterns and key sustainability factors such as product quality, marketing, and product pricing. The results and findings reveal that farmers highly agree that product quality, marketing, and product pricing matter in terms of usage rate segmentation. In addition, farmers agreed that enhancing operational sustainability is mostly possible. Lastly, the regression analysis demonstrates that usage rate segmentation significantly influences operational sustainability.*

Keywords— Usage Rate Segmentation, Operational Sustainability, Product quality, Marketing, Product Pricing, Farmers

1. INTRODUCTION

1.1 Background of the Study

Agriculture remains a key industry in the Philippines, providing livelihoods for millions of farmers. Many local farmers, however, struggle with sustainability owing to fluctuating market demand, unequal pricing, and limited access to effective marketing tools. Renowned for its rice and vegetable farming, Candaba, Pampanga's farmers battle ongoing production expenses, market rivalry, and climate-related risks. These factors interfere with their ability to operate consistent and successful businesses.

This research evaluates the influence of various agricultural resource utilization rates on both short and long-term farm viability as well as productive efficiency in Candaba, Pampanga. The study aims to develop beneficial recommendations for increasing production by analyzing vital resource management elements that support both sustainable resource utilization and long-term regional preservation. The research investigates how using usage rate segmentation can enhance sustainable land operation practices for Candaba farmers. The research explores customer buying patterns to help farmers enhance their marketing strategies while promoting sustainable farming practices, which can guarantee long-term business stability.

1.2 Objective of the Study / Statement of the Problem

General Objective

The main objective of this study is to examine how usage rate segmentation impacts operational sustainability levels for farmers.

Specific Objectives:

A. How do the respondents assess the usage rate segmentation in terms of:
- A.1 Product Quality;
- A.2 Marketing;
- A.3 Product pricing; and

B. How may respondents' operational sustainability be assessed?
C. Is analyzing usage rate segmentation significantly impacting operational sustainability of Candaba farmers?

1.3 Significance of the Study

This research examined how usage rate segmentation influences the operational sustainability of farmers. Additionally, the results of this study may provide significant benefits to the following:

Farmers of Candaba. This study might help the farmers enhance the agricultural sector of Candaba by applying usage rate segmentation while considering operational sustainability.

Consumers. The research result may help the consumers be knowledgeable about local farmers' products. This can be of great help for consumers to become smart in terms of purchasing, especially those local products produced by farmers. Lastly, to give awareness to consumers about usage rate segmentation, which is basically a way to determine whether a purchaser is a light, moderate, or heavy user.

Future Researchers. Future research surveys will benefit from the findings of this inquiry. Future researchers can use the information as a guide in producing and conducting new studies. The future researcher can also continue the study by figuring out the research gap or applying the analysis to different locations so they can provide a broader study area and strengthen the research objectives.

2. METHODOLOGY

2.1 Research Design

The research design chosen for this study used descriptive-correlational methods to understand the connection between usage rate segmentation and operational sustainability among farmers in Candaba, Pampanga. The descriptive section detailed the division of farmers into groups according to their frequency of product use. The correlational analysis established connections between different types of firms and sustainability elements, such as product quality and marketing, together with pricing. The research method employed quantitative techniques for inspecting numerical data to generate statistical findings about variable relationships according to Seeram (2019). This method ensures fairness and helps us conclude based on the data given.

2.2 Population and Sample of the Study

The study applied quota sampling to achieve representativeness in the selected sample. The sampling technique of quota starts with describing the entire universe first before building quotas for specific units, then selecting the individuals who fulfill the quota requirements according to Iliyasu and Etikan (2021). Although there are a few issues with quota sampling, the quality and trustworthiness of administrative data sources define how accurate and fair they are. The study's respondents are farmers at the municipality of Candaba in Pampanga, who served as the study's main respondents. It is essential to include this particular demographic group to obtain appropriate information and viewpoints regarding the impact of usage rate segmentation on their operational sustainability. The study focused on one hundred (100) farmers. Local farmers make up the primary focus of the adapted questionnaire when analyzing consumer behavior in the market.

2.3 Research Instruments

The authors used survey questionnaires as their main instrument to obtain necessary research data. The researchers modified the survey questionnaire for their research purpose. The researchers adapted all their questions from literature documents and added other applicable qualifications.

The survey is divided into two sections. Usage rate segmentation among consumers is the focus of the first section within the survey questionnaire. The survey delivered two sections where the operational sustainability initiatives were located.

There are twenty-seven (27) items included to analyze the usage rate segmentation and operational sustainability of farmers: there are five (5) items under product quality, five (5) items under marketing, and five (5) items under product pricing. There are twelve (12) items under operational sustainability. All of which would use a 4-point Likert scale to measure the statements.

2.4 Data Collection Procedure

There are comprehensive instructions on how to distribute and have the adapted questionnaires filled out by Farmers in Candaba, Pampanga. To improve the accuracy and dependability of the data collected, the researchers prioritized maintaining confidentiality, encouraging voluntary participation, and providing clear instructions to enhance the accuracy and reliability of the collected data.

The researchers distributed the questionnaire via Traditional Printed Forms and used a 4-point Likert scale to assess respondents' agreement or disagreement with the statements. The researchers distributed the questionnaire personally, the quickest and most convenient method of communication.

Researchers asked for permission and helped respondents with questions they did not understand. Follow-up was done until all the necessary information was collected.

1. Define Research Objectives: Clearly outline the research objectives and the purpose of the study. Determine the variables to be examined and the relationships to be explored.

2. Design the Questionnaire: To match the research goals researchers, need to develop a questionnaire structure. Before final implementation of the questionnaire present it to a few participants to detect any confusing content and resolve any concerns.

3. Sampling Strategy: Select the target group members to create the sampling framework for identifying the necessary sample size. Computing the sample size requires both confidence level precision and margin of error definitions.

4. Data Collection: Administer the questionnaire to the selected sample. Monitor data collection to maintain quality control and address any issues that may arise.

5. Data Entry and Cleaning: Enter the collected data into a spreadsheet (Microsoft Excel).

6. Descriptive Analysis: Calculate descriptive statistics (Mean and Standard deviation).

7. Regression Analysis: Determine the research-driven variables needed for regression analysis.

8. Interpretation and Reporting: Nature of the data obtained from descriptive statistical analysis along with correlation results and their relevance to research objectives should be analyzed. An evaluation of results should identify all noticed patterns while exploring their meaning.

The provided procedure enables researchers to obtain data through descriptive-correlation analysis and an adapted questionnaire for effective data evaluation.

2.5 Statistical Treatment

The research data interpretation included the weighted mean analysis, the 4-point Likert scale, and linear regression as statistical tools. The textual information utilizes three evaluation methods that consist of weighted mean analysis with a 4-point Likert scale and linear regression to interpret data patterns.

All of the information was gathered and handled using statistical procedures. The information gathered from respondents is examined, protected, calculated, and statistically handled. The information gathered would be put into a useful manner, thereby augmenting the depth of understanding regarding the impact of usage rate segmentation on operational sustainability.

A weighted mean was used to describe the level of response to the assessment of the effects of usage rate segmentation on operational sustainability, where it calculates the average value of the data. A weighted mean function through averaging all products that result from multiplying outcome weights with their corresponding quantitative values (Taylor, 2023).

Survey participants evaluated green marketing effects on customer preferences through a scale consisting of four different rating points. The 4-Point Likert Scale constitutes a survey approach through which researchers use four response choices to evaluate opinions and attitudes according to ChartExpo (2024). Data evaluation and explanation happen through linear regression analyses when participants choose between strongly disagree, disagree, agree, and strongly agree options to show their stance on given statements. IBM defines linear regression analysis as a tool that enables users to forecast variable values by analyzing different variable data points.

Table 1: Likert Scale

Scale Value	Range Interval	Descriptive Interpretation
4	3.26-4.00	Strongly Agree
3	2.51-3.25	Agree
2	1.76-2.50	Disagree
1	1.00-1.75	Strongly Disagree

3. RESULTS AND DISCUSSION

This portion of the study shows the analysis and interpretation of the gathered data from the group of respondents.

A. How do the respondents assess the usage rate segmentation in terms of:

Product Quality

The product quality rating received an overall mean score of 3.29 according to Table 3 with a standard deviation of 0.45. The interpretation is Strongly Agree. In Question one, 3.34 mean and 0.61 Standard Deviation with the interpretation of Strongly Agree. The responses to Question two demonstrated 3.28 as the mean score along with 0.55 Standard Deviation which indicates a Strongly Agree rating. A mean score of 3.28 together with a Standard Deviation measurement of 0.62 signifies a Strongly Agree response to the question. The result from Question four indicates Strongly Agree through a mean score of 3.30 along with a Standard Deviation of 0.59. Participants responded Strongly Agree to question five which received a mean score of 3.23 along with a Standard Deviation measurement of 0.58.

Table 2: Product Quality

Product quality

Indicators	Weighted Mean	Verbal Interpretation
The Color of the rice matters	3.34	Strongly Agree
The smell of the rice matters	3.28	Strongly Agree
The taste of the rice is a top priority.	3.28	Strongly Agree
The Uniformity in size is important.	3.30	Strongly Agree
The quality of rice matters more than the quantity.	3.23	Agree
Grand Mean	**3.29**	**Strongly Agree**

Legend: 1.00 – 1.75: Strongly Disagree, 1.76 – 2.50: Disagree, 2.51 – 3.25: Agree, 3.26 – 4.00: Strongly Agree.

Marketing

Table 3 indicates that the Marketing section received a 3.34 rate in Overall Mean assessments accompanied by a 0.42 Standard Deviation score. The interpretation is Strongly Agree. In Question one, 3.33 mean and 0.57 Standard

Deviation with the interpretation of Strongly Agree. The survey data shows Strongly Agree based on 3.32 mean and 0.57 Standard Deviation. The data in question three shows a mean score of 3.35 and standard deviation value at 0.58 which demonstrates a strongly agree response. The Strongly Agree interpretation exists for question four because the results demonstrate a 3.37 mean alongside 0.60 Standard Deviation. The results showed a 3.33 mean and 0.62 Standard Deviation spread which led to the interpretation of Strongly Agree (Question five).

Table 3: Marketing

Marketing

Indicators	Weighted Mean	Verbal Interpretation
The Preference to buy from a single supplier is common among consumers.	3.33	Strongly Agree
The Brand name significantly influences purchasing decisions.	3.32	Strongly Agree
The impact of advertising affects rice buying behavior.	3.35	Strongly Agree
The Packaging of rice plays an important role in attracting buyers.	3.37	Strongly Agree
The availability of rice in the market is essential for consumers.	3.33	Strongly Agree
Grand Mean	**3.34**	**Strongly Agree**

Legend: 1.00 – 1.75: Strongly Disagree, 1.76 – 2.50: Disagree, 2.51 – 3.25: Agree. 3.26 – 4.00: Strongly Agree.

Product pricing

The results in Table 4 demonstrate that participants scored Product pricing at 3.29 on Overall Mean and 0.51 on Standard Deviation. The interpretation is Strongly Agree. In Question one, 3.29 mean and 0.70 Standard Deviation with the interpretation of Strongly Agree. The data points toward Strongly Agree since the mean score reached 3.34 while Standard Deviation sat at 0.59. Consequently the rating for Question three demonstrates Agree according to a mean score of 3.15 alongside Standard Deviation of 0.69. The responses for Question four show Strongly Agree based on a mean score of 3.34 combined with Standard Deviation of 0.68. Survey questionnaire item five showed a 3.35 mean evaluation mark alongside 0.59 Standard Deviation rating which translates to "Strongly Agree."

Table 4: Product pricing

Product pricing

Indicators	Weighted Mean	Verbal Interpretation
The willingness to pay slightly more for locally sourced rice is evident among buyers.	3.29	Strongly Agree
The lowest - prices products are often preferred by cost-conscious consumers.	3.34	Strongly Agree
The highest quality, even at a premium price, appeals to certain buyers.	3.15	Agree
The Price is a major factor in rice purchasing decisions.	3.34	Strongly Agree
The preference for quantity over quality influences consumer choices.	3.35	Strongly Agree
Grand Mean	**3.29**	**Strongly Agree**

Legend: 1.00 – 1.75: Strongly Disagree, 1.76 – 2.50: Disagree, 2.51 – 3.25: Agree. 3.26 – 4.00: Strongly Agree.

B. How may respondents' operational sustainability be assessed?

Operational Sustainability

Table 5 presents an Overall Weighted Mean rating of 3.42 for Operational Sustainability accompanied by a Standard Deviation value of 0.32. The interpretation is Strongly Agree. In Question one, 3.26 Weighted Mean and 0.63 Standard Deviation with the interpretation of Strongly Agree. Respondents scored 3.30 Weighted Mean and displayed 0.69 Standard Deviation in this question which received Strongly Agree interpretation. The Weighted Mean score reached 3.21 while Standard Deviation achieved 0.57 in question three resulting in a Strongly Agree interpretation. The respondents' ratings in question four demonstrated a 3.31 Weighted Mean and 0.66 Standard Deviation at a Strongly Agree interpretation level. The overall Weighted Mean reached 3.36 while Standard Deviation amounted to 0.59 which indicates Strongly Agree responses. The respondents showed strong agreement with an average rating of 3.52 and Standard Deviation of 0.59 regarding Question six. The seventh question obtained a Weighted Mean of 3.49 alongside a Standard Deviation of 0.59 indicating Strongly Agree. The findings from question eight present a weighted mean score of 3.54 and standard deviation of 0.56 which indicates a strong agreement level. The responses to Question nine yielded a 3.50 Weighted Mean coupled with 0.59 Standard Deviation indicating Strongly Agree. The response to question ten revealed a weighted mean of 3.56 along with 0.57 Standard Deviation indicating uniform agreement. The responses rated 3.43 on average using weighted mean calculations and achieved 0.61 standard deviation which indicates strong agreement. The participants selected a weighted mean of 3.51 while displaying a standard deviation of 0.58 to indicate their Strong Agreement with the statement.

Table 5: Operational sustainability

Operational sustainability

Indicators	Weighted Mean	Verbal Interpretation
An organization applies knowledge and experience to develop operational processes.	3.26	Strongly Agree
Practices support sustainable, continuous operational improvements.	3.30	Strongly Agree
The organization conducts consistent audits for result measurement and improvement identification.	3.21	Agree
Measurable goals are set for tracking improvement progress.	3.31	Strongly Agree
Organizations learn from their experiences to enhance their operations.	3.36	Strongly Agree
The organization evaluates operations for continuous improvement.	3.52	Strongly Agree
The organization's methods encompass sustainability considerations in decision-making processes.	3.49	Strongly Agree
The organization supports collaborative operational practices.	3.54	Strongly Agree
The organization communicates openly with stakeholders to build trust and transparency.	3.50	Strongly Agree
The organization fosters innovation and efficiency for long-term economic growth.	3.56	Strongly Agree
The organization assesses economic risks and opportunities to support sustainable development.	3.43	Strongly Agree
The organization creates environmental responsibility plans and trains employees.	3.51	Strongly Agree
Grand Mean	**3.42**	**Strongly Agree**

Legend: 1.00 – 1.75: Strongly Disagree, 1.76 – 2.50: Disagree, 2.51 – 3.25: Agree. 3.26 – 4.00: Strongly Agree.

4. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

4.1 Summary of Findings

A. Usage rate segmentation

The analysis of consumer perception revealed that marketing received the highest grand mean, indicating that branding, promotional efforts, and visibility significantly influence consumer choices. Product quality followed closely behind, suggesting that while consumers value the texture, aroma, and consistency of rice, marketing plays a more decisive role in their purchasing decisions. Pricing had the lowest grand mean, which implies that cost is not the primary factor consumers consider when buying rice.

B. Operational sustainability

The results demonstrate that marketing attracts customers and ensures continuous demand, thereby significantly impacting the sustainability of rice farming activities. Although product quality is still a key consideration, the research indicates that even premium rice needs efficient marketing plans to get to customers. Conversely, pricing by itself cannot support farming enterprises; consumers will pay fair prices if the rice is well-marketed and considered high quality.

C. *Relationship Between Usage Rate Segmentation and Operational Sustainability*

The calculated grand means show that consumer buying behavior is shaped by a mix of marketing, product quality, and pricing. But for farmers to survive, they have to give marketing tactics top priority even as they keep steady product quality. Branding initiatives, direct-to-consumer sales, and digital marketing, according to the study, help rice farmers boost sales and promote sustainability.

4.2 CONCLUSIONS

A. The results of the study confirmed that consumers consider marketing strategies to be critical, as they had the greatest grand mean over the three sub-variables. This finding suggests that visibility, branding, and marketing campaigns have a major impact on purchasing behavior. Before thinking about product quality as a vital element, consumers give priority to aspects like texture, scent, and consistency. Conversely, pricing came last, indicating that even if cost is significant, people will still purchase rice at reasonable prices if it is well-marketed and perceived as high quality.

B. The study found that the sustainability of rice farming operations is most significantly influenced by marketing efforts. Though they grow excellent rice, inadequate branding and advertising could restrict their market reach. According to the study, marketing will keep demand, guarantee steady income for rice producers, and help build customer loyalty. Although product quality is still very important, it has to be combined with effective marketing tactics to best capture consumer interest. Conversely, price by itself is not a good indicator of sustainability since consumers value other elements more than cost.

C. According to the study, Sustainable rice farming calls for farmers to include marketing, quality preservation, and fair pricing in their business strategies. Though all factors are significant, marketing is especially important since it drives more sales and market presence. Farmers who keep great product quality and enhance their branding and marketing strategies will be able to create a devoted consumer base. Moreover, although price is still relevant, it is not the only thing affecting buying choices; hence, a thorough approach including all three components is necessary.

4.3 RECOMMENDATIONS

The recommendations on the study:

1.The study tells farmers in Candaba that they need to market their products to make sure their business will be around for a long time. Farmers care most about the price and quality of their rice, but better marketing could attract more customers. Farmers are encouraged to look into direct selling options instead of relying on middlemen. For example, they could work with local stores and markets or even set up small stalls to sell their rice directly to customers. Collaborating with other farmers to form a cooperative can also help with bulk

buying and setting prices. Consumers tend to select rice products that display their contents and information in an easy-to-read manner. Farmers should utilize social media platforms, including Facebook Marketplace and other networks, for free product promotions to expand their customer base. Small marketing strategies that improve customer shopping experience alongside free market samples have proven effective for boosting demand for local rice produce.

2. The study shows how important consumers are to helping Candaba farmers make a living. People should buy rice from local farmers or cooperatives instead of big-name brands whenever they can. This method not only makes sure that the farmers get paid fairly for their work, but it also keeps local farming going. People should also be aware that marketing tricks like fancy packaging and well-known brand names don't always mean that the product is of higher quality. People should look for freshness, texture, and smell in rice when they buy it. Furthermore, encouraging locally grown rice varieties can raise the demand for conventional and native rice varieties, which could be better for the environment. Simple things like spreading the word about locally grown rice through word of mouth and sharing what local farmers know on social media can also help.

3. This study will give future researchers a benefit on how usage rate segmentation affects operational sustainability. However, further research is necessary to explore other challenges that farmers encounter. One big problem with this study is that it doesn't look at how government agricultural policies, changing production costs, and climate change might affect the long-term viability of rice farming. Researchers could look into how weather patterns, irrigation systems, and the price of fertilizer affect farmers' income and crop yield in the future. Case studies of successful farmer cooperatives or direct-to-consumer marketing strategies could give people in Candaba useful ideas. To find better ways to help local farmers, looking at the results of government programs like farm-to-market road projects and subsidies could also be helpful.

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