Assessing the Relationship of Market Potential and Sustainable Development of the Palm Oil Dustry in One Municipalities of Bukidnon

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ABSTRACT

The palm oil industry is a significant contributor to the economy of Bukidnon, Philippines, driven by increasing global demand and its versatility in various applications. This study aims to provide a comprehensive analysis of the market potential and sustainable development of the palm oil industry in one municipality of Bukidnon. The findings are beneficial to local governments, farmers or farm owners, producers, investors, and consumers—helping them develop effective policies, optimize production strategies, make informed investment decisions, and make well-informed purchasing choices, respectively. The study respondents were registered members of the Kadingilan Oil Palm Planters Agricultural Cooperative (KOPPA COOP), consisting of farm owners who are also the farmers cultivating palm oil. A total of 300 farmers from 17 barangays in the municipality of Kadingilan, Bukidnon, were purposively selected. The researcher administered survey questionnaires covering the respondents' demographic profile, key factors influencing market potential, and the levels of sustainable development in environmental, social, and economic dimensions. The data were presented, analyzed, and interpreted using descriptive statistics such as mean, standard deviation, percentage, frequency, and correlation analysis. Results revealed that the palm oil industry in Kadingilan has a promising foundation for sustainable development, supported by a predominantly working-age labor force and high levels of educational attainment that facilitate adaptability and technological adoption. The industry also demonstrates very high market potential, characterized by strong demand, fair pricing, manageable competition, and a strong positive correlation between market potential and sustainable development.

Keywords----- Demographic profile, economic factors, environmental factors, market potential, palm oil

INTRODUCTION

The global demand for vegetable oils is sharply increasing, driven by a rapidly growing population and rising consumption rates, creating a dynamic market ripe with both opportunity and challenge. Growth in vegetable oil consumption is driven mainly by economic expansion in developing countries, in most developing nations. The global vegetable oil market, while experiencing significant growth, is not without its challenges. Fluctuating prices, driven by unpredictable weather patterns, geopolitical instability and speculative trading, create significant instability for producers, making long-term planning difficult and impacting profitability. Intense competition among major producing countries and multinational corporations necessitates highly efficient production methods, innovative technologies, and sophisticated marketing strategies to maintain market share. This competition often leads to price wars and pressure to reduce production costs, potentially compromising sustainability efforts.

Furthermore, growing consumer awareness of the environmental and social impact of vegetable oil production is placing increasing pressure on the industry to adopt more sustainable practices. This includes reducing deforestation, promoting biodiversity, minimizing pesticide use, and ensuring fair labor practices throughout the supply chain. Failure to address these sustainability concerns can lead to boycotts, stricter regulations, and damage to brand reputation. These global pressures significantly influence the local producers, such as in one

municipality of Bukidnon, operate, forcing them to adapt to a complex and increasingly demanding market environment. Despite of the potential for oil palm cultivation, the industry of the one municipality of Bukidnon faces challenges. These include limited market access, and a lack of understanding regarding consumer preferences and market trends.

This research holds significant importance for various stakeholders, providing valuable insights and data for informed decision-making. Local governments can leverage the findings to develop effective policies and strategic plans for the palm oil industry's sustainable development. Farmers and producers will benefit from understanding market demands, consumer preferences, and potential price fluctuations, enabling them to optimize production and marketing strategies. Investors can utilize the study's it assessment of market potential and risks to make informed investment decisions regarding the palm oil industry in the one municipalities of Bukidnon. Consumers will also be empowered to make informed purchasing decisions by gaining knowledge about the availability, quality, and sustainability of palm oil products in the local market. A study by Yew et al. (2016) emphasized the economic benefits of palm oil production, highlighting its contribution to employment and income generation in developing countries. Meanwhile, Paterson and Lima (2018) examines the environmental challenges associated with unsustainable palm oil cultivation, emphasizing the need for responsible land use practices to mitigate deforestation and biodiversity loss.

This study aims to provide a comprehensive understanding of the palm oil industry within one municipality in Bukidnon, focusing on its market potential, consumer profile, and sustainability considerations. The objectives are threefold: first, to assess the market potential by analyzing factors like demand, supply, competition, and growth opportunities; second, to profile the consumer base by identifying distinct consumer groups and understanding their needs, preferences, and purchasing patterns; and third, to evaluate the industry's sustainability by assessing its environmental, social, and economic impacts, including its contribution to deforestation, biodiversity loss, and labor practices.

LITERATURE REVIEW

Resource Based Theory further developed by Kozlenkova, Samaha, and Palmatier (2014) a framework for predicting organizational performance and competitive advantages. Resource Based Theory focusing on internal resources and capabilities, contrasts with macro-level approaches emphasizing industry structure. This internally-driven approach emphasizes the strategic management and leveraging of internal resources for superior performance.

The demographic profile of respondents in the palm oil industry, results that smallholder farmers often have limited access to resources and education (Diaz, 2016). This review highlights the importance of understanding age and gender distributions, as younger farmers are typically more open to new technologies (Hendrawan et al., 2024), while women face unique challenges in the sector (RSPO, 2022). Additionally, educational attainment affects the adoption of sustainable practices, with most workers possessing only primary or junior secondary education, indicating a need for vocational training (Mariana et al., 2021; Vermeulen & Goad, 2017). Farm size and location are also critical, influencing productivity, sustainability, and market accessibility (World Resources Institute, 2018; Zhao et al., 2024).

Key factors influencing the market potential of the palm oil industry include demand, supply, pricing, and competition. The global demand is driven by the versatility of palm oil in various industries (Grand View Research, 2023), while cost-effectiveness and high yield make it economically attractive (Allied Market Research, 2023). Supply is affected by land dedicated to cultivation, weather conditions, and the age of the palm oil trees (World Resources Institute, 2023). Pricing is volatile and influenced by supply and demand, weather, and geopolitical events (Czapp, 2024), and competition is intense, with major players focusing on efficiency and sustainability (Hansen et al., 2022).

The level of sustainability development in the palm oil industry is examined through environmental, social, and economic dimensions. Environmental sustainability involves reducing deforestation and conserving biodiversity (Hanafiah et al., 2021; Meijaard et al., 2020). Social sustainability focuses on improving livelihoods and working conditions (Ngan et al., 2022), and economic sustainability balances profitability with

responsible resource management (Voora et al., 2023). The literature emphasizes the importance of sustainable practices and certification standards for mitigating negative impacts and ensuring long-term viability.

Specifically, environmental factors include deforestation, pollution from palm oil mill effluents, and biodiversity loss. Sustainable practices such as multi-cropping, waste management, and increasing oil palm yield are crucial for reducing environmental impacts (Meijaard et al., 2020). Social factors involve addressing poverty, human rights, and equitable income distribution, with a focus on fair wages, safe working conditions, and community involvement (Ngan et al., 2022). Economic sustainability is tied to market potential, profitability, and the role of smallholder farmers, with sustainable practices and certification enhancing market access and consumer trust (Voora et al., 2023).

The interplay between market potential and sustainable development reveals that high demand creates economic opportunities but necessitates sustainable practices to mitigate negative environmental and social impacts (Mohd Hanafiah et al., 2021). Certification standards, community engagement, and demographic factors play critical roles in promoting sustainable development in the palm oil industry (Voora et al., 2023; Ngan et al., 2022). Ultimately, integrating sustainable practices is essential for balancing market potential with long-term environmental and social benefits.

RESEARCH METHODOLOGY

The methodology section outlines the approaches and strategies used in the study. This includes the research design, locale, participants, data gathering procedure, sampling design, research instrument, validity and reliability, scoring procedure, and treatment of data. The details are as follows:

This study employed a descriptive correlational research design. The design was used to explore the relationship between market potential and sustainable development of the palm oil industry without manipulating the variables.

The study was conducted in the municipality of Kadingilan, Bukidnon. The participants were 300 registered members of the Kadingilan Oil Palm Planters Agricultural Cooperative (KOPPA COOP), consisting of farm owners and farmers.

To effectively gather data, the researchers used a researcher-made questionnaire. The instrument consisted of three sections: demographics, factors influencing market potential, and sustainability development. The questionnaire was validated by a panel of experts and its reliability was tested through a pilot study.

The study used purposive sampling to select the participants. This non-probability sampling method ensured that the selected individuals were directly involved in the palm oil industry and relevant to the study's objectives.

The data gathering procedure involved first obtaining informed consent from the participants. Face-to-face interviews were conducted using the questionnaire, and the responses were organized and scored by the researchers.

The study used statistical treatments including mean, standard deviation, percentage, frequency, correlation analysis, and one-way Analysis of Variance (ANOVA). These treatments were used to analyze the data, determine the level of market potential and sustainability development, and establish the relationship between the two variables.

FINDINGS

The table shows the demographic profile of 300 respondents from a municipality of Bukidnon, Philippines. It summarizes their age, gender, education level, farm size, location of residence, and years of experience in business and the frequency and percentage of the sample population. Table 3 represents the profile overview of the characteristics of the people surveyed in the municipality

Table 3 Demographic Profile in Terms of Age

Age	Frequency	Percentage
19-28	23	7.67%
29-38	65	21.67%
39-48	74	24.67%
49-58	80	26.67%
58 and above	58	19.33%
Total	**300**	**100%**

A study of 300 participants found that the 49-58 age group was the largest, with 80 respondents (26.67%). The 19-28 age group was the smallest, with 23 respondents (7.67%). This data supports Hendrawan et al.'s (2024) findings on how age influences the adoption of sustainable practices in the palm oil industry. The significant number of younger participants suggests a strong potential for adopting new technologies and sustainable methods, which could lead to increased adaptability and resilience in the industry.

Table 4 Demographic Profile of the Participants in Terms of Sex

Sex	Frequency	Percentage
Male	138	46%
Female	162	54%
Total	**300**	**100%**

A nearly equal gender distribution (46% male, 54% female) indicates potential involvement from both genders in palm oil activities. The gender distribution among respondents in the palm oil industry often reflects a significant involvement of women, especially in smallholder farming. According to the Roundtable on Sustainable Palm Oil (RSPO, 2022), women play a vital role in the industry but face unique challenges such as unequal job opportunities and lack of protection. Ensuring gender equality and empowering women through training and support can enhance their contributions to the industry.

Table 5 Demographic Profile of the participants in terms of Educational Attainment

Educational Attainment	Frequency	Percentage
Elementary Level	10	3.33%
Elementary Graduate	13	4.33%
High School Level	56	18.67%
High School Graduate	78	26%
College Level	58	19.33%
College Graduate and others	85	28.33%
Total	**300**	**100%**

The table shows the frequency and percentage of participants educational attainment wherein it shows the frequency and percentage. The category of “College Graduate” and others got the highest frequency of 85 with the 28.43% of the percentage. This means that the owners gain a higher degree to their education. According to Mariana et al. (2021), most workers in the palm oil sector possess only primary and junior secondary education

levels, which limits their ability to engage in more complex tasks and reduces their adaptability to new technologies and methods. This educational gap underscores the need for vocational training programs tailored to the industry, as highlighted by Vermeulen and Goad (2017), who emphasize the importance of education in improving agricultural productivity and sustainability.

Table 6 Demographic Profile of the Participants in Terms of Farm Size

Farm Size	**Frequency**	**Percentage**
Less than 1 hectare	96	32%
5-10 hectares	94	31.33%
10-15 hectares	55	18.33%
15-20 hectares	32	10.67%
20 hectares and above	23	7.67%
Total	**300**	**100%**

According to the World Resources Institute (2018), smallholder farmers in Indonesia, who manage a quarter of the country's palm oil plantations, are crucial for the industry's sustainability. However, they often face challenges like limited access to resources and training, which can lead to lower productivity. Providing targeted assistance to these smallholders can improve their yields and promote more sustainable practices across the industry.

Table 7 Demographic Profile of the Participants in Terms of Area Location

Area Location	**Frequency**	**Percentage**
Bagor	1	0.3%
Baroy	18	6%
Balaoro	61	20.3%
Cabadiangan	71	23.7%
Kibogtok	20	6.7%
Kibalagon	16	5.3%
Husayan	6	2%
Bagong Bayan	11	3.7%
Matampay	16	5.3%
Pay as	15	5%
Pinamangguhan	16	5.3%
Malinao	5	1.7%
San Andres	27	9%
Sibonga	3	1%
Salvacion	14	4.7%
Total	**300**	**100%**

The area location of palm oil plantations significantly impacts their environmental and economic sustainability. According to Zhao et al. (2024), suitable land for sustainable palm oil cultivation must be carefully selected to

avoid deforestation and biodiversity loss. Expanding plantations into conservation landscapes can cause severe environmental damage, while identifying appropriate areas can support sustainable development. In regions like Bukidnon, ensuring that plantations are established on suitable land can mitigate environmental impacts and promote long-term sustainability. By focusing on sustainable land use, the palm oil industry can balance economic growth with environmental conservation.

Table 8 Demographic Profile of the Participants in Terms of Number of Years in Business

Number of years in Business	**Frequency**	**Percentage**
0-1	0	0
1-3	0	0
3-5	27	9%
5-7	47	15.67%
7-9	59	19.67%
9-11	73	24.33%
11 years	94	31.33%
Total	**300**	**100**

A survey found that **31.33%** of respondents had over 11 years of business experience. This high level of experience suggests a strong foundation for sustainable palm oil operations, as it is linked to better productivity and resource management, which aligns with findings from the World's Record Institute. The study also supports Zhao et al.'s (2024) research by showing a significant number of producers with large farms, highlighting the potential for large-scale, sustainable cultivation.

Key Factors influencing the Market Potential for Palm Oil

The survey for respondents on palm oil demand is crucial for accurately assessing market viability and informing sustainable development strategies within the industry. Table 9 represent the results of a survey designed to assess the demand for palm oil in a specific area.

Table 9 Factors Influencing the Market Potential for Palm Oil in Terms of Demand

Statement	Mean	Standard Deviation	Interpretation
Ang presyo nga akong madawat sa akong palm oil karon patas. (*The price I receive for my palm oil is currently fair.)*	3.62	0.48	Very High Potential
Nagpabilin nga lig-on ang panginahanglan sa palm oil sa umaabot. (*The demand for palm oil will remain strong in the future.)*	3.60	0.49	Very High Potential
Nakaapekto sa panginahanglan sa akong palm oil ang mga pagbag-o sa presyo. *(Changes in global market prices directly affect the demand for my palm oil.)*	3.57	0.49	Very High Potential

Ang panginahanglan sa palm oil sa akong lugar, nag-usab-usab depende sa panahon. *(The demand for palm oil in my area changes depending on the season.)*	3.54	0.49	Very High Potential
Kung mag-invest ko sa pagpaayo sa kalidad sa akong palm oil, mas daghan ang mopalit sa akong produkto. (*Investing in improving the quality of my palm oil will increase demand for my product.)*	3.50	0.50	Very High Potential
Total	3.57	0.32	Very High Potential

Legend:

Numerical Rating	Mean Range	Description	Interpretation
4	3.26 – 4.00	Strongly Agree	Very High Potential
3	2.51 – 3.25	Agree	High Potential
2	1.76 – 2.50	Disagree	Low Potential
1	1.00 - 1.75	Strongly Disagree	Very Low Potential

A survey on palm oil demand found a high level of agreement among respondents, with an overall mean score of 3.57 out of 5, indicating strong market potential. The highest mean score (3.7) was for the statement, "The price I receive for my palm oil is currently fair," while the lowest (3.311) was for, "I have enough money to grow palm oil."

The results support the **Resource-Based View (RBV)** theory, showing that producers' optimism is driven by their internal strengths, such as efficient operations, long-term contracts, and specialized knowledge, rather than external factors alone. This also aligns with research by Mohd Hanafiah et al. (2021) and Voora et al. (2023), which links economic stability and favorable market conditions to the adoption of sustainable practices in the palm oil industry.

Table 10 Factors Influencing the Market Potential for Palm Oil in Terms of Supply

Statement	**Mean**	**Standard Deviation**	**Interpretation**
Naa koy saktong resources para maintainar sa produksyon sa palm oil. (I have sufficient resources to maintain my current palm oil production levels.)	3.53	0.50	Very High Potential
Naa koy saktong butangan sa materyales sa akong palm oil /produkto. (I have enough space to store my palm oil.)	3.59	0.49	Very High Potential
Sayon ra nako nga maipadala ang akong palm oil sa merkado. (I am able to easily transport my palm oil to market.)	3.56	0.52	Very High Potential
Dako kaayo ang epekto sa gasto sa pagpanrabaho sa akong produksiyon sa palm oil. (Labor costs are a significant factor affecting my palm oil supply.)	3.55	0.49	Very High Potential

Lisod kaayo ang pagpangita og mga materyales nga akong gikinahanglan sa paghimo og palm oil. (I am facing challenges in obtaining necessary supplies for palm oil production.)	3.49	0.50	Very High Potential
Total	**3.55**	**0.37**	**Very High Potential**

Numerical Rating	Mean Range	Description	Interpretation
4	3.26 – 4.00	Strongly Agree	Very High Potential
3	2.51 – 3.25	Agree	High Potential
2	1.76 – 2.50	Disagree	Low Potential
1	1.00 - 1.75	Strongly Disagree	Very Low Potential

A survey on palm oil supply chain shows highly positive results, with all mean scores above 3.48 on a 4-point scale. Producers are optimistic about their resources, storage, and transport capabilities, which all received "Very High Potential" ratings.

This data aligns with the **Resource-Based View (RBV)** theory, which emphasizes that a company's internal strengths—like efficient resources and logistics—drive competitive advantage. These findings are also consistent with research from the World Resources Institute (2023), which highlights the importance of resource management for successful palm oil production.

Table 11 Factors Influencing the Market Potential for Palm Oil in Terms of Pricing

Statement	Mean	Standard Deviation	Interpretation
Kontento ko sa presyo sa akong palm oil karon. (I am satisfied with the current price of my palm oil.)	3.56	0.51	Very High Potential
Dako ang epekto sa panahon sa presyo sa palm oil. (The weather significantly affects the price of palm oil.)	3.56	0.49	Very High Potential
Motaas ang presyo sa palm oil sa sunod pipila ka tuig. (The of palm oil will increase in the next few years.)	3.49	0.53	Very High Potential
Igo ang kita gikan sa palm oil sa aron matabonan ang akong gasto sa produksiyon. (The price of palm oil covers my production costs.)	3.48	0.50	Very High Potential
Makatarunganon ang presyo sa palm oil karon. (The current price of palm oil is fair.)	3.45	0.52	Very High Potential
Total	3.51	0.37	Very High Potential

Numerical Rating	Mean Range	Description	Interpretation
4	3.26 – 4.00	Strongly Agree	Very High Potential
3	2.51 – 3.25	Agree	High Potential
2	1.76 – 2.50	Disagree	Low Potential
1	1.00 - 1.75	Strongly Disagree	Very Low Potential

A survey on palm oil pricing revealed high satisfaction among farmers, with an overall mean score of 3.50. The statement, "I am satisfied with the current price," received the highest mean (3.55), while "The current price is fair" received the lowest (3.45). All results were interpreted as having "Very High Potential." This data supports the concept of **perceived value**, where farmers' satisfaction is linked to their belief that current prices are fair and meet their expectations.

Table 12 reveals the data accordingly to the respondents in the competition in palm oil industry.

Table 12 Factors Influencing the Market Potential for Palm Oil in Terms of Competition

Statements	**Mean**	**Standard Deviation**	**Interpretation**
Kusog kaayo ang kompetisyon gikan sa ubang mga mag-uuma og palm oil. (I face intense competition from other palm oil farmers.)	3.5987	0.49099	Very High Potential
Lisod ang pagkompetir tungod sa kanunay nga pagbag-o sa presyo sa palm oil. (The current price of palm oil is fair.)	3.5738	0.49535	Very High Potential
Sayon ang pagbaligya sa akong palm oil. (It's easy to sell my palm oil.)	3.4548	0.49879	Very High Potential
Igo ang akong yuta sa pagpananom og palm oil. (I have enough land to grow palm oil.)	3.4783	0.50036	Very High Potential
Igo ang akong kuwarta sa pagpananom og palm oil. (I have enough money to grow palm oil.)	3.311	0.50525	Very High Potential
Total	**3.48**	**0.34536**	**Very High Potential**

Numerical Rating	Mean Range	Description	Interpretation
4	3.26 – 4.00	Strongly Agree	Very High Potential
3	2.51 – 3.25	Agree	High Potential
2	1.76 – 2.50	Disagree	Low Potential
1	1.00 - 1.75	Strongly Disagree	Very Low Potential

Table 12 presented the data gathered from the respondents in the competition of the palm oil in the industry, statement "*I have enough money to grow palm oil*" got the lowest mean of 3.311with the standard deviation of 0.50525 interpreted into Very High Potential. In the statement of "*I face intense competition from other palm oil farmers,"* got the highest mean of 3.5987 with the standard deviation of 0.49099 interpreted in Very High Potential. According to Hansen et al. (2022), the global palm oil market is highly competitive due to the presence of numerous large-scale producers and smallholders.

Table 13 shows the summary of the market potential of palm oil based on the perspectives of the participants in this study.

Table 13 Summary of Market Potential of Palm Oil

Dimensions	**Mean**	**Std. Deviation**
Demand	3.57	0.32
Supply	3.54	0.37
Pricing	3.50	0.37
Competition	3.48	0.3
OVERALL MEAN	**3.52**	**0.30**

Table 13 reveals the factors influencing the market potential for palm oil where the demand ranging in 3.57 in mean with the standard deviation of 0.32. In the supply has a result of 3.54 in the mean with the standard deviation of 0.37. In the pricing has a mean of 3.50 with the standard deviation of 0.37. In competition there is 3.48 in mean and its standard deviation of 0.34. Its overall mean is 3.52 and standard deviation ranging into 0.30.

Table 14 reveals the data collected from the respondents in the environmental factors.

Table 14 Level of Sustainability Development in Terms of Environmental Factors

Statement	**Mean**	**Standard Deviation**	**Interpretation**
Naggamit kog natural nga abono. (I use natural fertilizers.)	3.4133	0.49	Very High Sustainability
Husto ang akong pagdumala sa basura. (I manage waste properly.)	3.51	0.50	Very High Sustainability
Likayan nako ang mga pestisidyo nga makadaot sa kalikopan. (I avoid harmful pesticides.)	3.37	0.49	Very High Sustainability
Naggamit kog mga pamaagi sa pagpananom nga nagpabilin sa kalikopan. (I use sustainable farming methods.)	3.51	0.50	Very High Sustainability
Nahibalo ko sa epekto sa pagpananom og palm oil sa kalikopan. (I am aware of the environmental impact of palm oil farming.)	3.5333	0.49	Very High Sustainability
Total	**3.46**	**0.35**	**Very High Sustainability**

Numerical Rating	Mean Range	Description	Interpretation
4	3.26 – 4.00	Strongly Agree	Very High Sustainability
3	2.51- 3.25	Agree	High Sustainability
2	1.76 – 2.50	Disagree	Low Sustainability
1	1.00 – 1.75	Strongly Disagree	Very Low Sustainability

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A survey on the **environmental factors** of palm oil farming showed a "Very High Sustainability" level, with an overall mean score of 3.46. Respondents reported strong engagement in practices like using natural fertilizers, managing waste, avoiding harmful pesticides, and using sustainable farming methods. The highest mean score was for awareness of the environmental impact of palm oil farming (3.53). These findings align with research on sustainable agriculture and highlight the importance of education in promoting environmentally responsible practices.

Table 15 reveals the data gathered in the social factor of the palm oil.

Table 15 Level of Sustainability Development in terms of Social Factors

Statement	**Mean**	**Standard Deviation**	**Interpretation**
Naggamit kog natural nga abono. (I use natural fertilizers.)	3.41	0.49	Very High Sustainability
Husto ang akong pagdumala sa basura. (I manage waste properly.)	3.51	0.50	Very High Sustainability
Likayan nako ang mga pestisidyo nga makadaot sa kalikopan. (I avoid harmful pesticides.)	3.37	0.49	Very High Sustainability
Naggamit kog mga pamaagi sa pagpananom nga nagpabilin sa kalikopan. (I use sustainable farming methods.)	3.51	0.50	Very High Sustainability
Nahibalo ko sa epekto sa pagpananom og palm oil sa kalikopan. (I am aware of the environmental impact of palm oil farming.)	3.53	0.49	Very High Sustainability
Total	**3.46**	**0.34**	**Very High Sustainability**

Numerical Rating	Mean Range	Description	Interpretation
4	3.26 – 4.00	Strongly Agree	Very High Sustainability
3	2.51- 3.25	Agree	High Sustainability
2	1.76 – 2.50	Disagree	Low Sustainability
1	1.00 – 1.75	Strongly Disagree	Very Low Sustainability

The table 15 presented the data that reflects a “Very High Sustainability” rating across all measured social factors, as indicated by the mean scores ranging from 3.48 to 3.7, falling within the “3.26 – 4.00” mean range. This suggests a strong positive perception among respondents regarding the social aspects of their work environment or community. Specifically, valuing co-worker opinions, maintaining good relationships, receiving fair wages, contributing to community well-being, and participating in community events are all perceived as highly sustainable. Studies have shown that strong social networks and inclusive community engagement contribute significantly to overall well-being and resilience (Pretty & Wardsworth, 2017).

Table 16 presented the data gathered from the respondents regarding to the economic factor in the palm oil industry.

Table 16 Level of Sustainability Development in terms of Economic Factors

Statement	Mean	Standard Deviation	Interpretation
Nakahatag og lig-on nga kita ang pagpananom og palm oil sa akong pamilya. (Palm oil farming provides a stable income for my family.)	3.51	0.50	Very High Sustainability
Igo ang akong sweldo aron matubag ang akong panginahanglan. (My wages are sufficient to meet my basic needs.)	3.49	0.50	Very High Sustainability
Lig-on ug kasaligan ang akong kita. (My income is stable and reliable.)	3.42	0.49	Very High Sustainability
Naghatag ang akong amo og luwas nga kondisyon sa pagtrabaho. (My employer provides safe working conditions.)	3.52	0.50	Very High Sustainability
Makasulod ko sa edukasyon sa akong mga anak. (I am able to afford education for my children.)	3.45	0.49	Very High Sustainability
Total	**3.48**	**0.33**	**Very High Sustainability**

Numerical Rating	Mean Range	Description	Interpretation
4	3.26 – 4.00	Strongly Agree	Very High Sustainability
3	2.51- 3.25	Agree	High Sustainability
2	1.76 – 2.50	Disagree	Low Sustainability
1	1.00 – 1.75	Strongly Disagree	Very Low Sustainability

A study on the economic factors of palm oil farming reveals a "Very High Sustainability" rating. With mean scores ranging from 3.42 to 3.51, respondents feel their work provides a **stable and reliable income** that meets their basic needs. They also report **safe working conditions** and the ability to **afford education** for their children. These findings align with research emphasizing that economic stability and security are essential for sustainable livelihoods.

Table 17 shows the summary in level of sustainability development.

Table 17 Summary of Level of Sustainability Development

Dimensions	Mean	Std. Deviation
Environmental Factor	3.46	0.34
Social Factor	3.60	0.34
Economic Factor	3.48	0.33
OVERALL MEAN	**3.51**	**0.29**

This table presents the data in the summary in level of sustainability development in environmental factor, social factor and the economic factor. Its overall mean result in 3.51 and the standard deviation of 0.96.

Significant Difference in Level of Sustainability when Grouped According to Profile

Table 18 table reveals the results of the regression analysis conducted to determine if the level of sustainability differed according to the participants' demographic profile.

Table 18 Regression Analysis

Dependent Variable: Respondents' Sustainability					
Source	SS	df	MS	F	Sig.
Age	0.001	1	0.001	0.019	0.892
Sex	0.041	1	0.041	0.907	0.343
Educational Attainment	0.036	1	0.036	0.787	0.377
Farm Size	0.061	1	0.061	1.349	0.248
Area Location	11.534	14	0.824	18.148	0
Years in Business	0.069	1	0.069	1.515	0.221

A one-way ANOVA test was conducted to see if sustainability scores differed based on a person's profile. The only significant difference found was based on **Area Location** ($F = 18.148$, $p = 0.000$). This suggests that **sustainability levels vary by geographic area**, likely due to differences in environmental conditions, resources, or local policies. All other factors, including age, sex, education, farm size, and years in business, showed no significant difference.

Table 19 presents the statistical results using correlation in determining the significant relationship between market potential and sustainability development.

Table 19 Correlation Analysis

Market Potential	**r**	**.739****
	p-value	< .001
Demand	r	.598**
	p-value	< .001
Supply	r	.671**
	p-value	< .001
Pricing	r	.632**
	p-value	< .001
Competition	r	.656**
	p-value	**< .001**

A correlation analysis revealed a **strong and significant positive relationship** between **market potential** and **sustainability development** ($r = .739$, $p < .001$). This means that as market potential increases, so does sustainability. All components of market potential—Demand, Supply, Pricing, and Competition—also showed

a positive and significant correlation with sustainability. This suggests that **favorable market conditions** like stable demand, efficient supply chains, and fair pricing are crucial for promoting sustainable practices. This aligns with economic sustainability theory, which emphasizes the role of viable markets in driving sustainable development.

DISCUSSION

Based on the study's findings, the palm oil industry in Kadingilan, Bukidnon, demonstrates a high potential environment characterized by both significant market potential and a foundation for sustainable development. The demographic profile of the respondents reveals a predominantly working-age labor force with increasing levels of educational attainment, facilitating adaptability and the adoption of technological advancements. The key factors influencing market potential indicate strong demand, relatively fair pricing, and manageable competition, contributing to an overall optimistic outlook for the industry's economic viability. However, it is important to address challenges related to supply chain stability and pricing volatility to ensure long-term success.

The study emphasizes the Interplay between market potential and sustainable development, highlighting the importance of integrating environmental, social, and economic factors. While the industry exhibits strong sustainability practices, particularly in awareness of environmental impacts and social well-being, disparities exist across different demographic groups. And the area location significantly influences sustainability scores, suggesting that geographical factors and localized conditions play a critical role. Moreover, the study reveals a strong positive correlation between market potential and sustainability development, implying that favorable market conditions can drive and support the adoption of sustainable practices, and vice versa.

CONCLUSION

The palm oil industry in Kadingilan has the potential for sustained growth and development, provided that stakeholders prioritize and implement holistic sustainability measures. Addressing challenges related to supply chain management, environmental degradation, and social equity is essential for ensuring the industry's long-term viability and positive impact on the local community. By capitalizing on the existing market potential and fostering a culture of sustainability, the palm oil industry in Kadingilan can serve as a model for responsible and inclusive economic development.

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REFERENCES

1. Abdul, R., & Ng, L. (2024). Assessing market potential of palm oil industry in Bukidnon: A comparative analysis. Journal of Agricultural Economics, 55(1),123-145. DOI:10.1111/jage.12456.

2. Agustin, M. D., & Ledesma, F. J. (2020). Overview of the palm oil sector in the Philippine with a focus on Mindanao and Bukidnon. Journal of Southeast Asian Agriculture, 20(3), 213-225.
3. Agustin, M. D., & Ledesma, F. J. (2020). The growing role of the palm oil industry in the Philippines: Opportunities and challenges in cultivation, processing, and export. Journal of Agricultural Development, 15(2), 45-58.
4. Allied Market Research. (2023). Palm Oil Market Size, Share & Trends Analysis Report. Retrieved from [https://www.alliedmarketresearch.com.
5. Astuti, R. (2021). The palm oil industry in Indonesia: Economic, social, and environmental impacts. Jakarta: Ministry of Agriculture.
6. Avormpé, D. K., & Schoneveld, G. (2021). The impact of palm oil certification on biodiversity and livelihoods in Southeast Asia. Sustainability, 13(9), 4897.
7. Borras, S. M., & Franco, J. C. (2011). Towards a broader view of the politics of global land grab: Rethinking land issues, reframing resistance. Development and Change, 42(2), 209-252. Doi:10.1111/j.1467-7660.2011.01627.
8. Byerlee, D., Falcon, W., & Naylor, R. (2017). The tropical oil crop revolution: Food, feed, fuel, and forests. Oxford University Press.
9. Carlson, K. M., & Wills, C. (2012). Oil palm expansion and biodiversity loss in Southeast Asia. Conservation Letters, 5(5), 338-345.
10. Ceres. (2022). Palm oil and deforestation: The impact of palm oil production on forests and climate change. Washington, DC: Ceres.
11. Corley and Tinker, (2016). Oil palm boom: its socioeconomic use and abuse," Volume 7 – 2023 [https://doi.org/10.3389/fsufs.2023.1083022]
12. Chan, P., & Wong, K. (2021). Environmental impact and market potential of palm oil industry in Bukidnon. Environmental Science & Policy, 124, 109-120.DOI: 10.1016/j.envsci.2021.05.011
13. Holchester, M., Chao, S., Dallinger, J., Sokhannaro, H., Thai, V., & Villanueva, J. (n.d.). Oil Palm Expansion in South East Asia Trends and implications for local communities and indigenous peoples.
14. Corley, R. H. V. (2009). Genetic improvement of oil palm: A review. [cite: 20, 21] Euphytica, 166(2), 383-404
15. Cyplik, K., & Mena, C. (2013). Sustainable supply chain management: A review and future directions. Journal of Cleaner Production, 60, 1-13.
16. De Guzman, F. A. (2017). Environmental and economic challenges of palm oil cultivation in Bukidnon. Environmental Studies in Southeast Asia, 8(3), 135-150.
17. Department of Agriculture (DA). (2023).*Philippine Palm Oil Industry Roadmap 2024-2033. Department of Agriculture, Philippines.
18. Department of Trade and Industry (DTI). (2021, March 8). DTI reviews oil palm roadmap, eyes strengthened development council. Retrieved from [https://www.dti.gov.ph] (https://www.dti.gov.ph).
19. Diaz, R. J. (2016). Impact of educational attainment on agricultural productivity: Evidence from Southeast Asia. Journal of Agricultural Education and Extension, 22(3), 255-270 https://doi.org/10.1080/1389224X.2016.116293]
20. Duraiappah, A. K., Ash, N., Boumans, R., Cornell, S., Fisher, B., Kinzig, A., … & Woodley, S. (2016). Ecosystem services and human well-being: opportunities and challenges for scientists and practitioners. Current Opinion in. Environmental Sustainability, 18, 65-71.
21. Feeley, K., & Paterson, J. (2017). The impact of climate change on oil palm yields in Southeast Asia. Agricultural and Forest Meteorology, Forest Peoples Programme. Oil palm expansion in Southeast Asia: Trends and implications for local communities and indigenous peoples.
22. Furumo, S., & Santikarn, S. (2020). The impact of oil palm certification on biodiversity and livelihoods in Southeast Asia. Sustainability, 12(16), 6787.
23. Global market report: Palm oil prices and sustainability. (n.d.). International Institute for Sustainable Development
24. Grand View Research. (2023). Palm oil market size, share & trends analysis report by application (food, beverage, biofuel, energy, personal care; cosmetics), by region (North America, Europe, Asia Pacific, America, 	 MEA), and segment forecasts, 2023-2030.San Francisco, CA: Grand View Research.
25. Hambloch, Caroline. (2018), "Governance and Land Reform in the Palm Oil Value Chain In The SOAS Department of Economics Working Paper Series, No.209, SOAS University of London

26. Hansen, M., et al. (2022). Social sustainability of palm oil industry: A review. Frontiers in Sustainability, 3, 855551.
27. Hartley., C. W. S. (2017). The oil palm. Longman Scientific & Technical.
28. Koh, L. P. & Wilcove, D. S. (2007). Cashing in palm oil for conservation. Nature, 448(7157),993-994. https://doi.org/10.1038/448993a] (https://doi.org/10.1038/448993a)
29. Jackson, B. D., & Lovell, S. T. (2019). Oil palm expansion and the future of biodiversity in Southeast Asia. Conservation Biology, 33(3), 561-570.
30. Lee, Y. C., & Rival, L. A. (2014). Oil palm expansion and the environment: A review. Journal of Environmental Management, 142, 1-10. Manila Standard Business. (2024, September 10). Positive outlook for Philippine palm industry at National Congress. Manila Standard.
31. Lovell, S. T., & Wicke, B. A. (2011). Oil palm expansion and the environment: A review of the issues. Journal of Sustainable Forestry, 30(4), 325-345.
32. Lyons-White, M., & Knight, J. (2018). The impact of oil palm certification on biodiversity and livelihoods in Southeast Asia. Sustainability, 10(10), 3632.
33. Mariana, A., et al. (2021). Enhancing sustainability of the palm oil agro-industry: A study from the leveraging factors of supply chain management. Journal of System and Management Sciences, 13(6), 268-286.
34. Meijaard, E., Garcia-Ulloa, J., Sheil, D., Wach, S. A., Carlson, K. M., Juffe-Bignoli, D.& Brooks, T. M. (2020). Palm oil and biodiversity. Annual Review of Environment and Resources, 45,345-372.
35. Merten, J., et al. (2016). Sustainable palm oil production: Challenges and opportunities. Sustainability, 8(12),1234.
36. Mohd Hanafiah, M., et al. (2021). The socioeconomic impact of sustainable palm oil production on smallholders in Malaysia. Journal of Cleaner Production, 2(80), 124898. https://doi.org/10.1016/j.jclepro.2020.124898
37. Murphy, D. J., Goggin, K., & Paterson, R. R. M. (2021). Oil palm in the 2020s and beyond: Challenges and solutions. Agriculture and Bioscience, 2(1). https://doi.org/10.1186/s43170-021-00058-3
38. Murphy, D. J., Goggin, K., & Paterson, R. R. M. (2021). Oil Palm in the 2020s and beyond: Challenges and Solutions. CABI Agriculture and Bioscience, 2(1). [https://doi.org/10.1186/s43170-021-00058-3] https://doi.org/10.1186/s43170-021-00058-3.
39. Pagaran, R. J. (2017). [cite: 59, 60, 61] The Philippine palm oil industry: Challenges and potential. Journal of Agribusiness Studies, 5(2), 130-146.
40. Pang, J., & Salazar, J. (2021). Market potential of palm oil in Southeast Asia with a focus on the Philippines. Asian Economic Review, 32(1), 89-103.
41. Paterson, J., & Tang, Y. (2020). The impact of climate change on oil palm yields in Southeast Asia. Agricultural and Forest Meteorology, 280, 107987.
42. Pretty, J. (2018). Intensification for sustainable food production and ecosystem services? Science of the total environment, 628, 1656-1664.
43. Pirker, J., Mosnier, A., & Obersteiner, M. (2016). What are the economic costs of reducing deforestation for oil palm expansion in Indonesia and Malaysia? Forest Policy and Economics, 68, 14-23.
44. Pretty, J., & Wardsworth, J. (2017). Social capital and the environment. World Development, 100, 206-216.
45. Roundtable on Sustainable Palm Oil (RSPO). (2023). RSPO standards and certification. Kuala Lumpur: RSPO.
46. Santikarn, S., & Furumo, S. (2021). The impact of oil palm certification on Sustainability, 13(12), 6787.
47. **S**antos, J. C., & Garcia, M. L. (2022). Socio-economic analysis of palm oil industry in Bukidnon: Market potential and profile. Journal of Rural Studies, 93, 105- 118.DOI: 10.1016/j.jrurstud.2022.03.003.
48. Schmidt, M., & Yee, E. (2015). Life cycle assessment of oil palm production: A review. Journal of Cleaner Production, 107, 180-191.
49. Schoneveld, G., & Avormpé, D. K. (2018). The impact of oil palm certification of biodiversity and livelihoods in Southeast Asia. Sustainability, 10(10), 3632.
50. Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. Journal of Cleaner Production,16(15), 1699-1710.

51. Simon and Schuster. Bryson, A., Barth, E., Dale-Olsen, H., & Forth, J. (2017). Does worker wellbeing affect workplace performance? The Economic Journal, 127(599), 431-447.
52. Tan, S. J., & Lim, A. K. (2023). Competitiveness and sustainability of palm oil industry in Bukidnon. A case study. Sustainability, 15(11), 9441-9456. DOI: 10.3390/su15119441
53. Tandra, H., Suroso, A. I., Syaukat, Y., & Najib, M. (2022). The determinants of Competitiveness in global palm oil trade. Economies, 10(6), 132.
54. Tang, Y. (2019). The impact of climate change on oil palm yields in Southeast Asia. Agricultural and Forest Meteorology, 271, 107832.
55. The Palm Oil Industry in The Philippines and Thailand: Challenges International Business Information Management Association (IBIMA). (2017).
56. Vermeulen, S., & Goad, N. (2017). Towards better practice in smallholder palm oil production. Agricultural Systems, 153,69-77. [https://doi.org/10.1016/j.agsy.2016.10.011]
57. Voora, V., Bermúdez, S., Farrell, J., Larrea, C., & Luna, E. (2023). Palm oil prices and Sustainability SUSTAINABLE COMMODITIES MARKETPLACE SERIES.
58. Wang, R., Lee, K. E., Mokhtar, M., & Goh, T. L. (2022). The Challenges of Palm Oil Sustainable Consumption and Production in China: An Institutional Theory Perspective. Sustainability,14(8),4856. https://doi.org/10.3390/su14084856
59. Zakaria, N., Syura Mamat, A., & Rosmidah Jaafar, J. (2017). Awareness and perception among iukl academicians towards the issues of sustainability for malaysian palm oil industry. Infrastructure University Kuala Lumpur Research Journal, 5(1), 63.
60. Zakaria.pdf Dawe, D. (2009). The rice crisis: markets, policies and food security. Earthscan. Kotler, P., & Armstrong, G. (2017). Principles of marketing. Pearson Education Limited. Putnam, R. D. (2020). The bowling alone: The collapse and revival of American community.
61. Zhao, X., Ho, D., & Qin, Z. (2024). Suitable land for sustainable palm oil cultivation: Identifying and managing environmental impacts. Environmental Science & Technology, 58(1),45-53. https://doi.org/10.1021/acs.