

Correlation of the Socio-Economic Indicators to the Household Income of Cacao Farmers in San Isidro, Davao Del Norte

Jean Rose B. Cuenca¹, Lorie Mae A. Castro²

¹ Asuncion National High School, Department of Education,

² College of Arts and Sciences, Mindanao State University – Tawi-Tawi College of Technology and Oceanography,

Abstract: This study is a quantitative study that used the descriptive co-relational design and focused on the relationship between the socio-economic indicators to the household income of cacao farmers in San Isidro, Davao del Norte. The objective of this study is to improve the farmers' livelihoods and promote sustainable cacao farming practices in the municipality. This study may contribute to the enhancement of the socio-economic well-being of cacao farmers and provide valuable guidance for stakeholders in the sector. It utilized the survey questionnaire method in gathering relevant data from respondents; selection was done using the stratified random sampling technique. After conducting frequency, percentage, and correlation analysis. This study found a significant correlation between socio-economic indicators and the household income of cacao farmers in San Isidro, Davao del Norte. The factors that do not have a strong correlation to the household income of the cacao farmers in San Isidro, Davao del Norte are production, educational attainment, infrastructure materials, and affiliations to organizations. Factors that show a significant role in their income are market conditions, access to resources, farming practices, water availability, household savings, insurance, access to communication, income sources, and access to healthcare services. However, each factor varies from its predicted value. Hence, this study offers valuable insights to the socio-economic dynamics of cacao farming in San Isidro, Davao del Norte. These findings can inform policymakers, agricultural agencies, and community development organizations in designing targeted interventions to address the specific needs of cacao farmers.

Keywords: cacao farmers, correlation, household income, socio-economic indicators, sustainable farming systems

I. INTRODUCTION

Municipal officials assert that San Isidro, Davao del Norte, a town with 25,000 residents, enjoys the advantages of fertile soil and a temperature resembling a rainforest, creating an optimal setting for cultivating cacao. They take pride in calling their town "the town that cacao (*Theobroma cacao*) has flourished in". However, the Philippine Statistic Authority reported a high poverty incidence rate of up to 25.12% in 2018 in San Isidro, Davao del Norte. Cacao farmers' socio-economic challenges in this area often hinder their ability to achieve sufficient income levels to improve their socio-economic status. Understanding the factors influencing household income among cacao farmers is crucial for developing targeted interventions and policies to help the farmers. The cacao industry needs support from various line agencies, private industries and other organizations to achieve a robust and sustainable industry structures.

Therefore, this study addresses the pressing need to understand the socio-economic factors that influence the income levels of cacao farmers in the municipality. By evaluating these factors, the study aims to contribute to developing effective strategies that can enhance the socio-economic conditions and improve the livelihoods of cacao farmers in San Isidro, Davao del Norte.

The dependent variable is the household income and the independent variables included in this study are age group, educational attainment, years in cacao farming, ownership status of dwelling, materials used to build their houses, savings, insurance, credit, affiliations, organization incentives, access to communication, and cacao product form sold.

II. RELATED LITERATURE

The study of Diaz et al. (2021) stated that it is critical to identify the socioeconomic factors of the small farmer households, their relationships, challenges and dilemmas. The information that was obtained from the study indicates that it is relevant to incorporate processes that enable assessing simultaneously a variety of indicators in order to identify the best agricultural practices in different production systems. The decision-making process can vary significantly, and the results may be specific for determined groups of people, places and situation. Primarily, it analyzed the socio-economic determinants that influence the application of agricultural practices in peasant families in

northern Columbia. It found out that the principal socio-economic factors that play a determinant role in the adoption of sustainable practices are education level, income from agriculture, access to credit and level of cooperative membership.

The study of Berg (2013) studied the socio-economic aspects and farming practices that could affect adoption of improved agricultural practices. It observed that adoption of new technology was significantly higher amongst farmers that relied only on farming as a source of income. There were no significant relationships between adoption of improved technologies and farmer age, off-farm income and cultivation methods. It concluded that there may be a lack of need and political will to develop strategies to improve crop production.

The study of Mazibuko et al. (2018) investigated the socio-economic factors contributing to smallholder farmers' availability, accessibility and satisfaction of agricultural infrastructure. The factors that had a positive and significant influence on agricultural infrastructure availability were household members' assistance in the farming enterprises, farm ownership, farm acquisition, farmers' occupation, farmer organization membership, sources of labor and farming experience. The factor that had a negative and significant influence on agricultural infrastructure availability was access to agricultural production inputs. Furthermore, the factors that had a positive and significant influence on agricultural infrastructure accessibility were: farmers engaging in non-farming activities, contact to extension services, farm ownership, farmers' occupations, farmer organization membership, sources of labor, farming experience and land tenure. Finally, the factors that had a positive and significant influence on smallholder farmers' satisfaction with agricultural infrastructure were: organization were the extension services originates, household members' assistance in the farming enterprises, government agricultural support, farm ownership, farmers organizational membership, farmer education level and marital status. The factors that had a negative and significant influence on smallholder farmers' satisfaction with agricultural infrastructure were: farmers age and gender of smallholder farmers.

The study of Faridi et al. (2021) investigates the socio-economic factors that gauge the status of the farmers community in South Punjab which was measured by household per capital income. It observed that almost 65 percent of the farmers are living below poverty line. The variables like education, health, land holdings, hybrid seeds and use of mechanization have a significant impact on farmers' status by raising per capital income. Better health facilities, availability of better seeds and provision of low-cost fertilizers are responsible for attractive farmers' status.

The study of Mishra et al. (2002) show that farm households as a whole are relatively better off than the average U.S. households, but about 6 percent remain economically disadvantaged relative to the rest of the population. The study also stated that farm households draw income from various sources, including off-farm work, other businesses operated, and – increasingly – nonfarm investments. Focus on a single indicator of well-being, like income, overlooks other indicators as the wealth held by the household and the level of consumption expenditures for health care, food, housing, and other items. Farm households are no different than other households in pursuing two careers and diversifying earnings. The farm business as a source of income has become increasingly less important to farm households, especially noncommercial farms (sales less than \$250,000 per year). While farm income exhibits considerable variability, farm household income is relatively stable. Income available to farm households can support a standard of living equal to or above that of the average nonfarm household. For most nonfarm proprietorship households, the business is the main source of income; for most farm proprietorship households, the farm detracts from total household income. The average wealth of farm households has increased, and farm households have broadened their investment portfolio to include more nonfarm components.

III. DESIGN AND METHOD

Since the study aims to describe the relationship between socio-economic indicators and household income, the researchers employed an approach that involves quantitative strategies for data collection. This approach utilized the checklist method of a survey questionnaire, emphasizing the need to meet the study objectives. The researchers subjected the collected data to frequency, percentage distribution, and correlation analysis.

3.1 CONCEPTUAL FRAMEWORK

The conceptual framework of this study is presented below (Figure 1). It provides a structure for analyzing the complex interplay of socio-economic indicators and their effects on the income of the cacao farmers in San Isidro, Davao del Norte. The dependent variable of this study is the household income that represents the primary outcome of interest that reflects the economic well-being of cacao farmers. The independent variables pertain to the socio-economic indicators are age group, cacao farmers' level of educational attainment, years in cacao farming, ownership status of dwelling, materials used to build their home, savings, insurance, credit, organization affiliation, organization incentives, access to communication, and cacao product form sold.

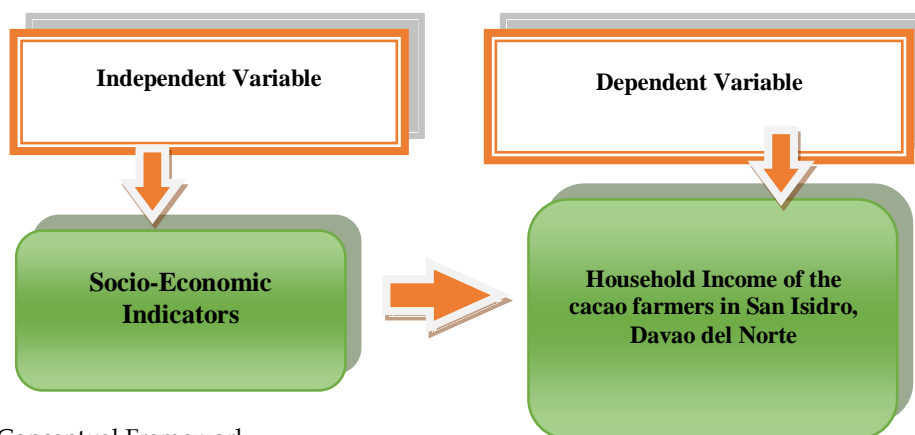


Fig. 1. Conceptual Framework

3.2 RESEARCH LOCALE

The individuals participated in this study are the cocoa growers in San Isidro, Davao del Norte. The Municipality of San Isidro, Davao del Norte is a 5th class municipality located on the island of Mindanao, Philippines, with map coordinates 7° 45' North, 125° 44' East. It was established through the ratification of Republic Act No. 9265 on March 15, 2004, under the administration of former President Gloria Macapagal-Arroyo. It has a total population of 27,233 individuals (PSA, 2020) and a total land area of 15,429 hectares.

3.3 RESEARCH RESPONDENTS

The study's respondents were 100 cacao growers from San Isidro, Davao del Norte. The total number of cacao growers in this area is 3,305 individuals. The respondents were selected randomly and voluntarily participated in the study.

3.4 RESEARCH INSTRUMENTS

This study obtained the farmer's total population from the official records of the Municipal Agriculture Office. A checklist survey questionnaire was utilized and data gathered were subjected to interpretation through frequency, percentage distribution, and correlation analysis.

3.5 DATA ANALYSIS

The collected quantitative data was analyzed using appropriate statistical techniques. The researchers computed descriptive statistics, such as frequency, percentage, and correlation analysis, to summarize the data and understand the correlation between variables. The researchers performed Frequency, Percentage, and Correlation analysis to ascertain the degree of the socio-economic indicators that predict the household income of cacao farmers.

Furthermore, the researchers will analyze the gathered data using the chi-square statistic, which tests the degree of agreement between a model and the actual observed data. The data generated by a chi-square statistic must be random, raw, mutually exclusive, obtained from a sufficient sample size, and independent variables.

IV. RESULTS AND DISCUSSIONS

According to the official records of local government of San Isidro, Davao del Norte, there are 3305 cocoa producers in the municipality. The margin of error considered in this study is 8.10%. Confidence level is 90%, and the response distribution is 50. This yielded a total of 100 respondents for this study using the Raosoft sample size calculator (Table 1).

TABLE I
SAMPLE SIZE RESULT

RAOSOFT SAMPLE SIZE CALCULATOR RESULT				
Margin of Error	Confidence Level	Response Distribution	Population size	Sample Size Result
8.10%	90%	50	3305	100

V. SUMMARY OF FINDINGS

1. The household income has no significant relationship to the current cacao product form sold by the respondents, which are the wet and dried beans, with a chi-square value of 0.593 and a p-value of 0.744.
2. The respondents' educational attainment has no significant relationship with their household income, with a chi-square value of 2.528 and a p-value of 0.865.
3. The materials used in building their house also do not have a significant relationship, even if the household income changes. It has a chi-square value of 2.280 and a p-value of 0.892.
4. The water availability of the respondent's households is significantly related to their household income. The chi-square value is 29.429, and the p-value of 0.000.
5. Household savings have a significant relationship with household income, with a chi-square value of 64.559 and a p-value of 0.000.
6. Household insurance has a significant relationship with household income, with a chi-square value of 12.157 and a p-value of 0.002.
7. The household income of the respondent does affect the communication access they afford. The chi-square value is 12.178, and the p-value of 0.016.
8. The respondents' household income affects the source of the money they borrowed, with a chi-square value of 33.775 and a p-value of 0.000.
9. The respondent's household income does not affect their organization affiliation, with a chi-square value of 1.811 and a p-value of 0.404.
10. The household income of the respondents has a significant relationship to the health access available to their community, with a chi-square value of 57.221 and a p-value of 0.000.

VI. CONCLUSION

6.1 CONCLUSION

Determining the correlation between the socio-economic indicators to the household income of cacao farmers is vital in advancing interventions in improving farmers' livelihood and promoting sustainable farming systems. The factors that do not have a strong correlation to the household income of the cacao farmers in San Isidro, Davao del Norte are production, educational attainment, infrastructure materials, and affiliations to organizations. Factors that show a significant role in their income are market conditions, access to resources, farming practices, water availability, household savings, insurance, access to communication, income sources, and access to healthcare services. These findings provide valuable insights to the socio-economic dynamics affecting the household income of cacao farmers in San Isidro, Davao del Norte. The conclusions drawn from this study can serve as a basis for developing targeted interventions and policies to improve the municipality's socio-economic conditions and income levels of cacao farmers. Furthermore, the findings contribute to the existing body of knowledge and can guide future researchers in conducting more in-depth investigations into the subject matter.

6.2 RECOMMENDATIONS

Based on the findings of the study on the correlation of socio-economic indicators to the household income of cacao farmers in San Isidro, Davao del Norte, the following recommendations are proposed:

1. Support for Aging Cacao Farmers: Recognizing that cacao farmers in San Isidro belong to the old age group, it is essential to provide support programs specifically tailored to the needs of older farmers. This can include training programs, access to technological advancements, and assistance in transitioning to more sustainable and efficient farming practices.
2. Enhancing Education and Skills Development: Since most cacao farmers in San Isidro have an elementary level of education, there is a need to focus on improving their educational attainment and skills. The Municipal Agriculture Office and relevant organizations can collaborate with educational institutions and provide training programs to enhance farmers' knowledge of modern farming techniques, market trends, financial management, and entrepreneurship.
3. Access to Land and Land Management: Given that most farmers own less than five hectares of land, there is a need to explore strategies that optimize land utilization and productivity. The Municipal Agriculture Office can

- guide land management practices, encourage land consolidation initiatives, and facilitate access to additional land for interested farmers through partnerships and land-sharing programs.
4. Income Diversification and Value-Added Processing: Addressing the poor household income of cacao farmers requires exploring income diversification strategies and promoting value-added processing of cacao products. The Municipal Agriculture Office can support farmers in accessing training, resources, and market linkages to explore product diversification, such as processing cacao into chocolates or other value-added products.
 5. Promotion of Proper Cacao Fermentation: Encouraging cacao farmers in San Isidro to adopt proper fermentation practices can significantly improve their cacao beans' quality and market value. The Municipal Agriculture Office can conduct training sessions, provide technical assistance, and facilitate knowledge-sharing platforms to educate farmers on the importance of fermentation and guide them in implementing effective fermentation processes.
 6. Strengthening Financial Literacy and Savings: The significant relationship between household savings and income suggests the need for financial literacy programs and access to formal financial services for cacao farmers. The Municipal Agriculture Office can collaborate with financial institutions to provide financial literacy training, promote savings initiatives, and facilitate access to appropriate financial services for farmers.
 7. Encouraging Insurance Coverage: Given the significant relationship between household income and insurance, efforts should be made to promote insurance coverage among cacao farmers. The Municipal Agriculture Office can work with insurance providers to develop affordable and tailored insurance packages that address cacao farmers' specific risks, such as crop failure, natural disasters, or price volatility.
 8. Improving Communication Access: Recognizing the impact of household income on communication access, efforts should be made to improve connectivity and affordability of communication services in rural areas. The Municipal Agriculture Office can collaborate with telecommunication companies and government agencies to expand network coverage, reduce costs, and provide training on utilizing communication technologies for accessing market information, agricultural extension services, and business opportunities.
 9. Facilitating Access to Credit: Given the significant relationship between household income and the source of borrowed money, there is a need to improve access to credit for cacao farmers. The Municipal Agriculture Office can work with financial institutions and cooperatives to develop tailored credit facilities, simplify loan processes, and provide financial counseling to farmers to ensure responsible borrowing practices.
 10. Strengthening Health Access: The significant relationship between household income and health access highlights the importance of improving healthcare services in the community. The Municipal Agriculture Office can collaborate with local health agencies and organizations to enhance healthcare facilities, promote health education, and facilitate access to affordable healthcare services for cacao farmers and their families.

These recommendations aim to address the challenges identified in the study and improve the socio-economic conditions and income levels of cacao farmers in San Isidro, Davao del Norte. By implementing these recommendations, the Municipal Agriculture Office, cacao farmers, and future researchers can contribute to the sustainable development of the cacao industry in the region and enhance the overall well-being of farmers and their communities.

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