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A Study on How Cafe Amadeo Development Cooperative Affects the Coffee Farmers' Living Wage

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Abstract

Agriculture, specifically farming, has been the primary source of livelihood for a large proportion of the Philippine population. Despite an increase in consumption, there is a decrease in coffee output that needs to be increased to supply domestic demand. Due to financial instability and a lack of resources, farmers join cooperatives to solve their concerns. This study examined and analyzed the effect of Cafe Amadeo Development Cooperative (CADC) initiatives on the living wages of their coffee farmers' members. This research proved whether CADC effectively boosts their living wages to enhance their lifestyles. Using Ordinal Regression Analysis, calculate the data from the primary data gathered through a quantitatively designed survey questionnaire from the members. The study's findings highlight the importance of coffee bean pricing and dividends in enhancing the living standards of coffee farmers. These factors contribute to higher living wages and improved overall well-being. However, loans and patronage, while not directly impacting living wages, play an essential role in addressing the financial needs of coffee farmers, both as farmers and as family providers. The research findings reflect on CADC initiatives and serve as a roadmap for their upcoming approach to promoting coffee farmers' advancement. Researchers recommend that Cafe Amadeo Development Cooperative (CADC) implement advances in farming practices and introduce modern machinery to foster growth. These measures can empower farmers, enhance their productivity, and increase their living wage.

Keywords: Cafe Amadeo Development Cooperative, Coffee Farmers, Philippine Agriculture, Living Wage

1. Introduction

Coffee has been a staple in the Philippines, with most Filipinos starting their day with a cup of hot coffee. In fact, the total coffee consumption in the country in 2020–2021 was about 3.30 million 60-kilogram bags, with an increased rate of 2.1% from 2018–2021 (Statista, 2023). While the consumption of coffee showed an upward trend over the past years, production output in the Philippines has decreased by 3.5% yearly over the past ten years. It has not been sufficient to accommodate domestic demand and export efforts. In 2019–2020, the country could only produce 307,000 60-kilogram bags of coffee, compared to 730,000 60-kilogram bags in 2009–2010 (International Coffee Organization, 2021). Sta. Barbara (2022) found a significant correlation between coffee consumption, local production, and yield,

and consumer consumption patterns and domestic coffee output influence market performance for coffee. Frajenal (2022) added that the price change is heavily affected by the movement of the coffee supply.

The Philippines is among the many developing countries with a large proportion of their population depending on farming as their livelihood (Quilloy, 2015). For a farmer, coffee is a business that provides a livelihood. However, the decline in product output reflects the different factors that influence this trend:

1. Coffee farmers who are unable to improve their quality of life given the "low" income they get out of selling coffee beans.
2. Decreasing hectares for coffee planted as farmers switch to fast crops that yield higher returns than coffee.
3. Poor quality of coffee produced due to poor farm practices.

Clearly, farmers cannot capture sufficient value from their hard labor.

While export capabilities and efficient local production are significant factors in achieving economic growth (Murindahabi et al., 2019), ensuring productivity and the overall well-being of coffee farmers is also a top priority. The Philippine Coffee Roadmap 2021-2025, through the initiative of the Department of Agriculture (DA), the Department of Trade and Industry (DTI), and in partnership with the private sector, seeks to accelerate the growth of the coffee industry by providing means for farmers and upscaling sustainable production technology in terms of production, processing, and marketing (BusinessWorld, 2022). Other than this program, the emergence of cooperatives in different areas of the country has also helped coffee farmers. When small-scale farmers join forces in a cooperative, they shape their path out of deprivation (McInerney, 2014).

Individual farmers formed a cooperative to address a shared issue facing farmers and pool resources, which allowed them to benefit from economies of scale and size (Albano et al., 2003). Cooperatives are organizations owned and operated by their members that build opportunities and sustainable communities, specifically in rural areas (EOS Data Analytics, 2022). Cooperatives are formed to provide economic, social, cultural, and spiritual development to all their members as they share common interests and possess the principle of cooperation (Sancheti, 2019), which decreases the information gap and market uncertainties (Candemir et al., 2021). Cooperation has long been nurtured throughout agricultural cooperatives to promote collaboration that augments farmers' conditions (Ahn et al., 2023). According to Pamaos (2008), open and voluntary membership, democratic control, limited interest in the capital, division of net surplus, cooperative education, and cooperation among cooperatives are the declared principles of cooperatives. Multipurpose, credit, service, consumers, producers, marketing, and agrarian reform are the common cooperatives in the Philippines. Since then, cooperatives have been among the most significant economic agents in the country, and they have been given legal acknowledgments, notably as a component of the 1987 Constitution and an amended cooperative code in 2008. Therefore, they became an instrument for social justice and economic development in government policy (International Cooperative Alliance, 2020). Due to the pooling of resources and joint operation, cooperatives allow farmers to operate their farms more efficiently, maximize their income, and improve the productivity of the entire agricultural industry by providing capital for investments and enabling the best possible use of large-scale facilities and specialized equipment (Albano et al., 2003).

Non-governmental organizations, including cooperatives, are equally crucial to the government's efforts as ideas are unified and actions are widened (Alves et al., 2022). Agricultural cooperatives possess further opportunities for improvement, but specific innovations fulfill their potential for bolstering initiatives that are already beginning to make a difference (Araullo, 2006). According to Hermanson et al.

(2021), a cooperative benefit its members by raising income, improving their financial situation, increasing the representation of women, boosting social capital, and lowering socioeconomic classes. Farmers' satisfaction with their cooperatives depends on member evaluations of the economic and social benefits they provide and how they view the environmental work that their cooperatives conduct (Yu & Nilsson, 2021).

Cafe Amadeo Development Cooperative (CADC) is an agricultural cooperative based in Amadeo, Cavite. Established and registered in June 2002, it has 442 cooperative members and 83 coffee growers. The CADC was established to revive the coffee industry by creating livelihoods and advancing Amadeo, Cavite, as one of the country's top coffee-producing districts. Robusta, Arabica, Excelsa, and Liberica (locally known as Kapeng Barako) are the types of coffee beans their member farmer's harvest. CADC has the mission of promoting coffee farmers' produce to various businesses and private individuals, assisting coffee-related Local Government Units (LGUs) nationwide to participate in several local and international fairs, and providing advocacy for various coffee-related issues. The cooperative offers loans equivalent to 80% of the share capital, distributes dividends ranging from 5% to 20% based on the net surplus, provides patronage amounting to 0.3% of total individual sales, and implements a 10% price hike every three years for its coffee farmers who are members of the cooperative. To collaborate and promote the coffee sector, it also seeks to forge ties between government organizations, LGUs, manufacturers, and private businesses, which will help Cavite's coffee industry gain domestic and international recognition. Given that the CADC intervenes with the coffee farmers, the current study analyzes the effect of the cooperative's initiatives on the members' wages and assesses their lifestyle.

The objective of the study is to determine whether the exogenous variables, [1] cooperative pricing, [2] dividends, [3] loans, and [4] patronage, affect the coffee farmers' living wage after being a member of the cooperative. With the decline of coffee production through the years and the country's failure to recover from being a leading exporter of coffee in the 19th century, farmers' participation in the production of coffee has played a vital role. Cooperative networks have strengthened in recent years in some production regions in the country, primarily Luzon, where Arabica is dominant. Support from the Department of Agriculture (DA) and local councils in the form of extension services and input provision has played an essential role in helping these cooperatives gain traction in their areas (Bamber et al., 2017).

The paper's main course of discussion examined the effects of CADC's initiatives on coffee farmers' wages, which are used to measure their livelihood. The paper covered the members' yearly average wage and social standing before and after joining the cooperative.

The success of coffee cooperatives, whether micro or large cooperatives, has been evident. However, due to the limited evidence-based studies that show the overall contributions of cooperatives, their benefits, and their success for communities and farmers are often overlooked. Thus, this paper analyzed the effect of CADC's initiatives on increasing the wages of coffee farmers members. It provides an outlook to CADC on the effects of their initiatives scoping the coffee farmers, which will help them to inspect what programs are for improvement or enhancement of guidelines.

2. Review of Related Literature

2.1. Farmers' Living Wage

As defined by Belli & Fabo (2017), a living wage is simply an amount of income sufficient to cover living costs. Lim and Werner (2016) argue that a living wage is a fundamental human right to uphold worker decency and ensure equitable pay. According to Pollin (2007), a living wage would guarantee that

workers earn enough to pay for necessities like housing, food, and healthcare. It would raise employee productivity, decrease turnover rates, reduce individual poverty, and boost the economy as consumers increase spending. In addition, because people are less likely to need government aid, it would lessen the strain on government social programs. However, as the notion of a decent lifestyle evolves, a living wage increasingly refers to the capacity to support yourself and your family and have the finances to volunteer for civic activities that will uphold your dignity in society and the nation. It acted as the foundation of a social contract and fostered the emergence of a working-class consciousness anchored in both the consumption and production sectors (Brenner, 2002).

The terms "living wage" and "minimum wage" were interchangeably referred to in the past. However, they have been modified since then because people who earn the minimum wage are safeguarded from poverty, which raises issues and concerns for unemployed and underemployed individuals. However, due to inflation and increased labor productivity, minimum wage workers experience a loss of purchasing power and plunge into poverty since the government cannot sustain them at pace with living wages (Belli & Fabo, 2017).

In developing countries, specifically in rural areas, a living wage is crucial, as farmers and workers are frequently paid salaries that fall short of what is necessary to support themselves and their families. The main barriers to the living wage's adoption include a lack of government regulation and enforcement, a lack of knowledge about the rights and advantages of a living wage, and the dominance of multinational firms that put profits ahead of the welfare of their workforces (Anker et al.; R., 2013). The study of Gardener et al. (2015) in Morocco, Malawi, Kenya, Vietnam, and Myanmar revealed that despite having a significant amount of work to do, all rural farmers and laborers in the five nations receive poor wages and benefits that cannot keep up with the rise in the cost of living, which causes a prevalent rate of poverty. Some are compelled to work overtime for an additional 10.5 hours a week on average to boost their income. Rather than having no revenue at all, farmers and workers opt to keep working even when they only make a meager wage.

Andersen L. E. et al. (2022) noted the significant poverty rate and income disparity in Peru's coffee and cocoa growing regions, where most people depend on agriculture as their primary source of income. Many smallholder farmers need help to make a decent living due to low crop yields, limited market access, and restricted access to financing and other financial services. Despite being one of the major coffee exporters in the world, Barbosa, A. D. F. et al. (2021) estimate that the income of coffee growers in Brazil's four regions is below average and insufficient to afford their cost of living and the cost of a basic basket of goods and services. Low returns make it challenging for coffee growers to establish and maintain sustainable means of subsistence and an equitable coffee supply chain. Given the higher market prices for organic goods, Amit (2009) hypothesized that organic farming could help farmers generate higher living wages to provide necessities for themselves and their families.

Additionally, according to Stolt Althén (2019), sustainability initiatives ensure sustainable coffee cultivation, which raises wages and sustainably upholds agricultural practices. Lastly, Quilloy (2015) states that small farmers joining cooperatives can gain self-empowerment to increase their output and economic opportunities, which will improve their standard of living. Having an interest in a cooperative would alleviate extreme poverty in rural areas (Mhembwe & Dube, 2017).

2.2. Cooperative Pricing to Farmers' Living Wage

Various factors can influence the pricing mechanisms of coffee that farmers produce, from product quality to consumer preferences and even competition among market participants. Coffee production has been facing menace in developing countries. Misuse of farmer's revenue by cooperatives has led to poor payments to farmers. A study conducted by Sabiri et al. (2020) focused on examining the influence of coffee pricing on the revival of coffee production in cooperative societies in Kenya. Coffee pricing improved sales clearance of stocks on time, which turned into revenue for farmers and reduced the waste of unused coffee beans. Results showed that coffee pricing significantly influenced the revival of coffee production in Kenya.

Another problem that farmers often need help with is their inability to negotiate the price of their coffee with collectors. One of the main factors in determining the price of Gayo arabica coffee from farmers is the quality of the coffee cherry. This coffee cherry tends to vary in the types of its fruit maturity. The more mature or uniform the cherry, the higher the selling price (Andriadi et al., 2019). Regarding participating in the production of specialty coffee, Wollni & Zeller (2007) argued that farmers who participate in the production of specialty coffee in cooperatives have a positive impact on the income they generate from choosing to grow specialty coffee compared to conventional coffee. It also pointed out that experience and education had a significant effect on the participation of farmers. It reflects the importance of cooperatives as an outlet for farmers to increase their profitability.

During harvest season, the collectors are the main target of the farmers to sell their produced coffee. The determining factors for farmers in selling their coffee to collectors are location, the ownership of facilities and equipment, cash payments and loans, and even the distance between the farmer's residence and the collectors. It makes it easier for the farmers to obtain coffee price information and will determine their income from the sale of coffee they have produced. (Andriadi, et al., 2019)

Ho: Cooperative Pricing have no significant impact on the Farmers' Living Wage

2.3. Dividends to Farmers' Living Wage

The primary motivation for coffee farmers to enter cooperatives differs from the expectation of higher prices. Instead, they join for various reasons, indicating that pricing is not the critical factor. These farmers perceive cooperatives as valuable due to their range of benefits, including dividend payments (Minten et al., 2018). For coffee farmers, significance of dividend payments is a crucial kind of incentive from a cooperative to sell their crops to them and refrain from side-selling (Shumeta, 2017). Cooperatives pay dividends to their farmers' members depending on the level of their engagement or the amount of coffee they supply and pay annually (Gashaw et al., 2018). Coffee farmers who are members of high-performing cooperatives exemplify greater productivity and generate higher prices and dividends, which leads to increased coffee income. Being a cooperative member benefitted earnings, although this was due more to improved pricing and dividend payments than to productivity increases (Woubie, 2015). Karunakaran (2018) asserts that coffee cooperatives have played a vital role in elevating the livelihoods of their members by making substantial contributions to their financial capital by providing multiple services, including dividend payments. The provision of dividends decreases the effective cost of the goods and services offered, thereby directly increasing the income of farmers (Ebbes, 2017).

Profitability and dividend payments have a symbiotic relationship, which implies that when profitability rises, dividend payments to farmers. However, there is a contradiction between dividend

distributions and the size of an agricultural organization. It implies that dividend payouts tend to decline as an agricultural organization's members increase (Waswa et al., 2014).

Gashaw & Kibret's (2018) study found that numerous coffee farmers were dissatisfied with the dividends they obtained from the cooperative to which they belonged. The delayed and relatively meager dividend payments received by coffee farmers harmed their income, reducing earnings (Mojo et al., 2017) and needing to be adequate to meet their basic daily needs (Mustefa, 2023). The absence of funds allocated for paying off the cooperative's debts is the primary reason for the lack of dividend payments to cooperative members. Members become frustrated by this circumstance, which also causes them to compromise their trust in the cooperative (Hirons et al., 2018). It suggests that cooperatives need to put in additional effort to establish a system that enables them to consistently distribute dividends, thereby guaranteeing the welfare and benefits of their members (Mustefa, 2023). Subsequently, a higher dividend payout might benefit a cooperative's members, as they could enhance the income that supports their way of life. Offering cooperative members competitive dividends was recommended to boost member satisfaction and entice additional coffee growers, which might increase membership (Gashaw & Kibret, 2018).

Ho: Dividends have no significant impact on the Farmers' Living Wage

2.4. Loans to Farmers' Living Wage

Small-scale farmers join and participate in cooperatives when farming is their primary source of income and when they lack access to other income streams and credit options. By becoming cooperative members, they gain access to credit loans, as cooperatives are recognized as significant credit providers (Issa & Chrysostome, 2015). Ameh and Lee (2022) found that farmers' choice of loan sources was positively influenced by their marital status, farm size, and interest rate. Additionally, the study revealed that the annual revenue generated from farming and the interest rate significantly positively impacted loan acquisition. Conversely, factors such as education, farming experience, farm size, off-farm income, and farm income played a vital role in determining the utilization of the loans.

According to Wairegi et al. (2018), it can reduce risks when farmers obtain cooperative loans. This is because cooperative officials can supervise the type, quality, and usage of inputs given to farmers. Consequently, the cooperative itself takes responsibility for ensuring the credit repayment. From the farmers' standpoint, whether they bear complete liability for their loans or uncertainty regarding their responsibility, they opt for loans that include insurance. However, when liability is restricted, farmers secure loans regardless of whether they come with insurance (Naranjo et al., 2019).

Granting loans to coffee farmers presents an opportunity for them to acquire fungicides to combat severe susceptibility to coffee leaf rust in their trees (Guido et al., 2020). It also empowers them to manage and mitigate risks associated with coffee production, thus achieving a stable income from farming (Li, 2015). Based on Mrindoko's research in 2022, small-scale farmers' household income is significantly impacted by the amount of the loan, the interest rate, the loan's accessibility, and the transaction fees. These factors contribute to an improvement in their living conditions and help them overcome extreme poverty.

The income coffee farmers earn through farming is used for essentials and household expenses. When they face financial shortages, they rely on credit resources, specifically loans, to enhance their cultivation methods and meet their daily needs. Consequently, loan repayments, including interest, are deducted from the proceeds from selling their coffee (Sembiring et al., 2018). In certain instances, when

a farmer's income decreases, their household responsibilities increase, causing them to divert farming loans for other purposes. As a result, they encounter challenges in repaying the loans (Wongnaa & Awunyo-Vitor, 2013). Whenever a farmer has a sole unsuccessful harvest, their finances are highly susceptible to collapse, leading them to become trapped in a harmful cycle of resorting to expensive loans to repay their farming loans from the previous year (Lambert & Jessica, 2020).

Ho: Loans have no significant impact on the Farmers' Living Wage

2.5. Patronage to Farmers' Living Wage

Patronage refunds/dividends are initiatives of cooperatives to pay their members who use their financial services. This small refund/dividend percentage is based on the member's output or harvest and is usually given to patronage cooperative credit services, knowing there is a refund/dividend (Kumkit et al., 2022).

Some cooperatives have poor performance due to bad management practices that affect overall member participation, which is why an effective indicator in evaluating the performance of cooperatives is assessing the farmers' income. In Jiangsu, China, farmers in cooperatives earned more than those not associated with them. Other than the typical benefits that contribute to the farmers' income, patronage refunds were also a factor for the farmers' income (Zheng et al., 2012).

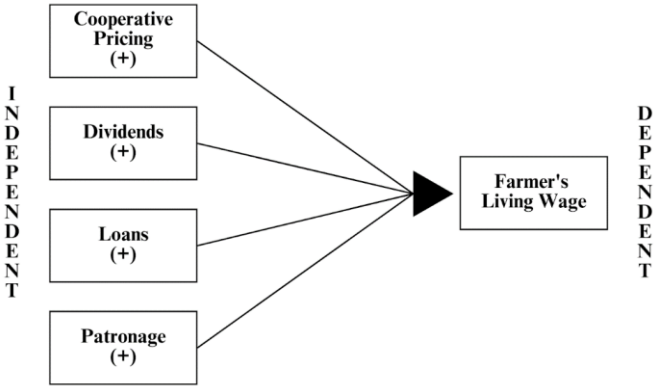
Royer and Smith (2007) suggest that cooperatives can still successfully distribute patronage refunds to their members while using prices to achieve optimal outputs. Zhang et al. (2013) found that credit cooperatives use patronage refunds as capital management and marketing tools to attract borrowers. It also indicated that a positive cash patronage refund depended on the outstanding loan interest margin size and not on profits, taxes, and unallocated retained earnings.

Ho: Operational Costs have no significant impact on the Farmers' Living Wage

2.6. Synthesis

The paper mainly utilized the studies of Wollni & Zeller (2007), Quilloy (2015), Mojo et al. (2017), Karunakaran (2018), and Andriadi et al. (2019), which discuss the role and impact of agricultural cooperatives on farmers, which can be applied to determine whether CADC are beneficial to its members coffee farmers. Based on the studies mentioned above, participation in agricultural cooperatives positively affects farmers through increased output, which translates into more household income. It has also given the farmers more opportunities to venture out by utilizing the resources brought by cooperatives. It has increased their overall self-empowerment, which is vital in improving their standard of living.

2.6.1. Simulacrum (Conceptual Framework)



3. Research Method

3.1. Research Design

The study used a quantitative approach and cross-sectional data to measure and determine the relationship between the variables involved using survey instruments. Similar studies by Akoyi & Maertens (2018), Mendez et al. (2010), Ndiritu et al. (2022), and Shumeta & D'Haese (2018), have used a standard quantitative cross-sectional study as part of their research design to obtain the results. The researchers utilized different statistical softwares, primarily MS Excel and SPSS as the principal statistical tools to run the primary data. To thoroughly understand the relationship of variables, the study also applied ordinal regression tests such as Goodness-of-Fit, Psuedo R-Square, Parameter Estimates, and Test of Parallel Lines.

3.2. Subjects

The research subjects were chosen on purpose since the study population entailed a criterion. With the use of purposive sampling, the study gathered notable and pertinent data from the sample units (Merriam and Tisdell, 2016). The requirements for participation are as follows: (1) a respondent must be a coffee farmer and (2) a member of CADC.

The study employs Creative Research Systems, a survey software solution since 1982, to determine the sample size for an accurate representation and reliable results. The sample size was calculated using a confidence level of ninety-five percent (95%), a confidence interval, also known as margin of error, of five percent (5%), and a population size of eighty-three (83).

Locus of the Study	Confidence Level	Confidence Interval	Population Size	Sample Size (*n*)
Cafe Amadeo Development Cooperative	95%	5%	83	69

3.3. Locus of the Study

This study has chosen 442 community members, of which 83 are coffee farmers, participating in Cafe Amadeo Development Cooperative (CADC) as the locus of the study. CADC was established and registered in 2002 under the Cooperative Development Authority Registry No. LGA-5263. Through the municipal government of Amadeo, this initiative revives the town's coffee industry as a major source of livelihood and income. The cooperative started with 20 members, mostly coffee millers, traders, producers, and farmers selling premium green coffee beans. One of the key missions of the cooperative is to help our farmers, specifically the coffee growers, promote their coffee beans to different companies, big or small, and private individuals as well. This study's chosen locus would be sufficient for gathering the information and data needed.

3.4. Data Instrument

The researchers utilized primary data collection to gather the data required for the study. A survey questionnaire that consists of standardized questions and close-ended questions was used to define observable and measurable components of the study. The research variables would determine the relationship between the independent and dependent variables. The researchers constructed the data instrument by examining appropriate questions relevant to the study. It includes a series of questions

regarding the following information: the respondent's demographic profile, factors influencing their interest in joining the cooperative, and the respondent's current state of life after joining the cooperative.

3.5. Data Collection Procedure

A quantitatively designed survey questionnaire with specific modules on cooperative pricing, dividends, loans, and patronage was the primary method of gathering data. The survey questionnaire also questioned respondent's socio-demographic profile, reasons for which they could be interested in joining the cooperative, and whether the cooperative helps improve their lifestyle, among other operational and detailed assessments of the variables.

The researchers used Google Forms to send out a survey to the coffee farmers. The survey link of the study was given to the cooperative contact person, who is responsible for sending it out to the coffee farmer members. Only the link to complete the survey was shared, not the link to edit, for privacy and confidentiality purposes. The survey did not require an email address and name; thus, everyone with a respondent's characteristics can participate. The survey took 15-25 minutes to complete, and the data information collected was used to calculate the research findings using several statistical software, mainly MS Excel and SPSS.

3.6. Ethical Considerations

Before the survey begins, an informed consent form was displayed to the respondents to be fully aware of the study's objectives and to freely decline to participate. The informed consent form states that the study aims to determine whether the exogenous variables, [1] cooperative pricing, [2] dividends, [3] loans and [4] patronage, affect the coffee farmers' living wage after being a member of the cooperative. The survey questionnaire was in Filipino, and participation was purely voluntary. The researchers treated all responses from the coffee farmers equally, regardless of age, gender, religion, social status, or ethnicity.

The researchers also acknowledge that the information gathered was highly confidential and anonymous and that they respect all the responses received. The personal information that was collected through the survey was used solely for research following the Data Privacy Act of 2012 (DPA), its Implementing Rules and Regulations (IRR), other directives of the National Privacy Commission (NPC), and other pertinent laws of the Philippines. Rest assured that the gathered data was handled with privacy and confidentiality, and it was securely stored in MS Excel, protected by a passcode accessible only to the researchers.

The researchers obtained ethical clearance for their data instruments from the Philippine National University's Educational Policy Research and Development Center to guarantee compliance with ethical standards.

3.7. Results Deployment and Impact

The research findings will be made available to CADC and its coffee farmers members by providing a digital copy of the final manuscript. Once the study is finished, the researchers will send a digital copy to the cooperative's contact person. The contact person will then share the study with the coffee farmer members and cooperative leaders. To ensure that the contact person shares the study, the researchers will ask for photos of the community having received copies. The CADC will benefit from the research findings as they will understand how well these initiatives perform in delivering services to coffee farmers. It aids in their self-evaluation of their areas of strengths and weaknesses. Furthermore, it

will give them a good overview of how their farming members are progressing, enabling them to plan immediately for what the farmers need. The researchers will also submit the final manuscript to various publications and journals for better exposure for others interested.

3.8. Data Analysis

3.8.1. Econometric Model

The study used an ordinal regression model, where the dependent variable of the study is the farmers' living wage, while cooperative pricing, dividends, loans, and patronage are the independent variables, to measure the provided econometric model.

$$\ln\left(\frac{FLW}{1-FLW}\right) = a_0 + a_1\mathrm{CP} + a_2\mathrm{D} + a_3\mathrm{L} + a_4\mathrm{P} + \in$$

Where:
FLW = Farmers' Living Wage
CP = Cooperative Pricing
D = Dividends
L = Loans
P = Patronage
a = Constant term or intercept
a_1 = Alpha Coefficient of Cooperative Pricing
a_2 = Alpha Coefficient of Dividends
a_3 = Alpha Coefficient of Loans
a_4 = Alpha Coefficient of Patronage
$\in$ = Error Term

3.9. Mode of Analysis

The collected data was refined and checked using Microsoft Excel before being exported to SPSS. The ordinal regression analysis was utilized to test the relationship between the dependent and independent variables. To check for the effectiveness of the analysis, parameter estimates was used, along with the following tests:

3.9.1. Goodness-of-fit

One significant use for a goodness-of-fit metric is in statistical analysis, where it is intended to ascertain whether the size of the empirical discrepancy measure allows for the rejection of the null hypothesis. One method is by determining the asymptotic setting of the test and the behavior of the test at a large quantile of the distribution. (Chwialkowski et al., 2016).

3.9.2. Pseudo R-Square

Measures are based on likelihood ratios. The ratio of the likelihoods suggests the level of improvement over the intercept model without predictors offered by the full model, that is, the model with predictors. A likelihood falls between 0 and 1, so the log of a likelihood is less than or equal to zero. If a model has a very low likelihood, then the log of the likelihood will have a larger magnitude than the log of a more likely model. (Ombui et al., 2011).

3.9.3. Test of Parallel Lines

You can determine whether it is acceptable to assume that the parameters are the same for all categories by using the test of parallel lines. In this test, a model with a single set of coefficients for every category is compared to an estimated model with a different set of coefficients for every category. (Saharwal et al., 2023).

4. Results and Discussion

The research objectives aim to analyze the effect of the initiatives of CADC on increasing the wages of coffee farmers who are members of the cooperative by determining whether the exogenous variables, [1] cooperative pricing, [2] dividends, [3] loans and [4] patronage, affect the coffee farmers' living wage after being a member of the cooperative. The empirical results for this study were gathered by distributing a survey approved by an ethics board to people in the area being studied. Statistical methods, such as parameter estimates and diagnostic tests, were used to analyze and interpret the collected data.

4.1. Empirical Results

The researchers utilized parameter estimates techniques to perform the required regression analysis tests and derive the corresponding results. A summary of the regression analysis is provided below.

Figure 4.1.1. Parameter Estimates

Parameter Estimates

							95% Confidence Interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Threshold	[FLW = 1.75]	7.925	4.681	2.866	1	.090	-1.250	17.099
	[FLW = 2.00]	9.733	4.723	4.247	1	.039	.477	18.990
	[FLW = 2.25]	11.187	4.766	5.510	1	.019	1.846	20.529
	[FLW = 2.50]	12.575	4.804	6.851	1	.009	3.159	21.991
Location	CP	2.615	1.283	4.151	1	.042	.099	5.130
	D	5.826	1.505	14.991	1	<.001	2.877	8.775
	L	-1.877	1.117	2.827	1	.093	-4.066	.311
	P	-1.079	1.404	.590	1	.442	-3.831	1.673

Link function: Logit.

The regression analysis in *Figure 4.1.1* implies that Cooperative Pricing (**CP**) and Dividends (**D**) have a positive relationship with Farmers' Living Wage (**FLW**). In contrast, Loans (**L**) and Patronage (**P**) are negatively associated with **FLW**. **CP** shows the strongest positive relationship, with a parameter estimate of 2.165, indicating that a one-unit increase in **CP** is associated with an average of 2.165-unit increase in **FLW**. This relationship is statistically significant (p-value = 0.042). **D** also shows a strong positive relationship with **FLW** (parameter estimate = 5.826), and this relationship is also statistically significant (p-value < 0.001). **L** and **P**, on the other hand, show negative associations with **FLW** (parameter estimates = -1.877 and -1.079, respectively). However, these relationships are statistically insignificant (p-values = 0.093 and 0.442).

Figure 4.1.2. Diagnostic Test: Goodness-of-Fit and Model Fitting Information

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	199.545	212	.721
Deviance	159.595	212	.997

Link function: Logit.

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	197.639			
Final	177.173	20.465	4	<.001

Link function: Logit.

Figure 4.1.3 shows that the p-values for Pearson's chi-squared test (0.721) and the deviance test (0.997) are not significant to reject the null hypothesis that the observed data matches the expected distribution. Additionally, the model fitting information has a p-value less than 0.001, indicating that the model is statistically significant. It means that the null that the model does not fit the data hypothesis can be rejected.

Figure 4.1.3. Diagnostic Test: Pseudo R-Squared

Pseudo R-Square

Cox and Snell	.254
Nagelkerke	.265
McFadden	.094

Link function: Logit.

According to Fig 4.1.3, McFadden's Pseudo R-squared statistic, used to assess the fit of the logistic regression model, yielded a value of 0.094. It indicates that the model accounts for approximately 9.4% of the variability in the dependent variable, the Farmers' Living Wage, indicating that it explains a relatively small proportion of the outcome's variation and suggests that other factors affect living wages that are not included in the model.

Figure 4.1.4. Diagnostic Test: Test of Parallel Lines

Test of Parallel Lines[a]

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	177.173			
General	172.052	5.121	12	.954

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. Link function: Logit.

According to Fig 4.1.4, a p-value of 0.954 in a test of parallel lines implies sufficient statistical evidence to accept the null hypothesis, which means that the lines are likely parallel. This high p-value implies that any observed differences between the lines are likely due to random chance rather than a systematic deviation from parallelism.

4.2. Discussion

Cooperative pricing has been vital in coffee farmers' participation in cooperatives. The study's findings suggest that reasonable cooperative pricing is associated with more income for coffee farmers. The result aligns with the studies of Sabiri et al. (2020), Andriadi et al. (2019), and Wollni & Zeller (2007), which discussed the positive influence of coffee pricing on improving income for coffee farmers. Cooperative pricing terms of CADC have also encouraged farmers who are members to continue coffee planting as the initiative of a price increase every three years from the cooperative benefits the living wages of farmers.

In addition to cooperative pricing, the dividends provided by CADC to its members also play a significant role in improving their living standards. As the dividends increase, the coffee farmers' overall income rises, allowing them to meet their basic needs and enhance their lifestyles. This finding aligns with previous research conducted by Karunakaran (2018), Ebbes (2017), and Gashaw & Kibret (2018), which presents that cooperative dividends can effectively reduce costs and directly boost the well-being of coffee farmers. The farmers' reliance on dividends for their livelihood has motivated them to join CADC. This study reinforces the findings of Minten et al. (2018) and Shumeta (2017), which indicate that dividend payments are a crucial incentive for farmers to participate in cooperatives, as they provide additional income to be invested in farming and personal expenses.

Furthermore, the study's findings indicate that loans provided by the cooperative have a statistically negative effect on the living wages of coffee farmers. It suggests that CADC members do not perceive cooperative loans as enhancing their living standards or increasing their income. This outcome aligns with previous research by Sembiring et al. (2018), Wongnaa & Awunyo-Vitor (2013), and Lambert & Jessica (2020), highlighting the challenges farmers face in repaying loans when they lack sufficient funds, leading to a cycle of dependence on high-interest loans. It contrasts with the findings of Li (2015) and Mrindoko (2020), who concluded that loans significantly improve farmers' living wages, contribute to stable income, and aid in poverty alleviation.

Lastly, the study's results suggest that patronage has a statistically negative impact on the living wages of coffee farmers. It indicates that patronage refunds are more of an incentive for farmers who use them for farming expenses rather than a contribution to their living wage. The study's results do not support previous studies as results vary and are subjective to how a group uses its resources.

5. Summary

5.1. Summary and Conclusions

The study focused on determining the effects of various programs (cooperative pricing, dividends, loans, patronage) of Cafe Amadeo Development Cooperative (CADC) on coffee farmers' living wages. Results from the study were mainly centered on 69 coffee farmers who are members of CADC. Data collection was conducted from October to November 2023. Furthermore, a cross-sectional quantitative approach was utilized along with ordinal regression analysis to further examine the relationship of variables.

Empirical results show that cooperative pricing and dividends are statistically significant factors affecting the farmers' living wage, with cooperative pricing having the most substantial positive relationship. Moreover, loans and patronage are not statistically significant factors affecting farmers' wages as loans are generally negative, and patronage is an incentive that farmers use for farming expenses rather than a portion of their living wage. Although the study results are focused on farmers' living wages, the researchers believe that Cafe Amadeo Development Cooperative's (CADC) initiatives benefit the coffee farmers' overall welfare based on the responses obtained.

5.2. Policy Implications

Cooperatives play a vital role in ensuring coffee farmers' economic well-being through transparent pricing and equitable dividend distribution. Establishing a fair base price for coffee beans instills trust among stakeholders and promotes a sense of fairness. Additionally, differentiated pricing based on coffee quality rewards farmers for their efforts. Regular dividend distributions align with the principles of fairness and inclusivity, providing farmers with a reliable source of income. Furthermore, utilizing dividends to fund cooperative development initiatives enhances efficiency, improves infrastructure, and fosters long-term sustainability. This approach prioritizes immediate financial gains for farmers while strengthening the cooperative's foundation for continued success. By embracing these principles, cooperatives can cultivate a thriving community and contribute significantly to the sustainable development of the coffee industry.

Moreover, with the emergence of various coffee cooperatives in the country, Cavite and neighboring provinces still have been the hub of cooperatives growing locally produced coffee beans. With its ideal location and sustainable development, the mission to promote local production and help coffee farmers' communities has been continuous and visible. The researchers believe that one of the factors for growth that Cafe Amadeo Development Cooperative (CADC) can rely on is innovation. Improving farming practices and introducing new machinery would benefit farmers as they strive to enhance their capability, which is often associated with added income. CADC has achieved numerous achievements in recent years. Completing the newly established P15.9 million Cavite Coffee Processing and Trading enterprise not only caters to more demand but also provides better opportunities for farmers and workers. With the support of the local government and international companies, uplifting the economy through the local production of coffee, the researchers commend the achievement of the cooperative and its role in the local community.

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