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Income Recovery of Workers Post-Covid-19: Evidence from the Agricultural Sector

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ABSTRACT

The COVID-19 pandemic has negatively impacted the income and employment of workers across all sectors worldwide. As the pandemic is controlled, workers need to adapt to the new circumstances and recover to stabilize and improve their lives. This study analyzes the recovery of income among agricultural sector workers in the post-COVID-19 period by comparing their earnings during the pandemic with their subsequent income. Data for this study was collected from 616 agricultural sector workers in Vietnam. The T-test and pooled OLS regression methods were used to assess differences in income between the two periods and to evaluate the factors influencing workers' earnings. The findings revealed that workers' income during the COVID-19 outbreak was significantly lower than in the post-pandemic period, with a difference of approximately -12.627 million VND per person per month. Additionally, the results identified that factors positively affecting workers' income include the number of income-generating activities and personal investments made by the workers themselves. These findings serve as a foundation for recommending strategies to diversify workers' livelihoods, thereby aiding them in stabilizing and increasing their income in the future.

Keywords: Employment; New Livelihood Strategies; Personal Investment; Number Of Income-Generating Activities; Vietnam

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1. Introduction

The COVID-19 pandemic has significantly impacted the livelihoods of workers worldwide. Job losses and reduced incomes have adversely affected the economic development and social security of many countries^[1,2]. In response to the pandemic's effects on income and employment, numerous studies have proposed new policies and strategies aimed at helping workers secure stable livelihoods in the post-COVID era^[3-5].

Vietnam has also experienced the repercussions of COVID-19, particularly in terms of workers' income and employment. According to GSO^[6], in its 2022 report on the pandemic's impact, approximately 16.9 million workers were adversely affected during the first quarter of 2022. Among them, 0.9 million lost their jobs, 5.1 million were forced to temporarily halt or suspend business activities, and 5.7 million faced reduced working hours, mandatory leave, or rotating shifts. The reduction in working hours and unemployment has substantially affected workers' earnings, directly influencing their standard of living and the country's social security system.

To address the challenges faced by the workforce, the Vietnamese government has implemented policies to support businesses, contributing to job creation in affected areas. Additionally, there are direct social security policies in place to assist workers impacted by the COVID-19 pandemic. According to statistics from GSO in their press release on the labor and employment situation in 2025^[7], the total number of employed workers in Vietnam stands at approximately 52.1 million, reflecting an increase of about 639.1 thousand workers compared to 2023. Of this total, around 13.5 million workers are employed in the agricultural sector, which accounts for roughly 26.0% of the overall labor force. However, despite this recovery, the economic growth overall and within the agricultural sector has not fully met the employment needs of the current workforce in that sector. The GSO also noted that by the end of 2024, the number of unemployed workers in the agricultural sector reached 381,500, accounting for approximately 49.9% of the total unemployed force. Stable employment is essential for ensuring a consistent income for workers.

Conversely, if employment is not secured, workers may face unemployment or underemployment, leading to insufficient working hours. This situation can negatively impact their income and overall financial stability.

In specific sectors, such as agriculture, the income of agricultural workers is primarily derived from the products they cultivate and consume. If the value chain is disrupted, it has a direct impact on the income and employment of those in the agricultural sector. The challenges faced are not due to a lack of food for daily sustenance; instead, they stem from the absence of additional income to support livelihoods, which affects people's ability to sustain their livelihoods. A typical example can be seen with workers in the agricultural sector, such as those providing services for agricultural tourism. During the COVID-19 pandemic, no tourists were visiting these areas. As a result, farmers lost their income, which hindered their ability to maintain and develop their properties. This lack of income also impacted their families, preventing them from achieving a stable livelihood. Consequently, the lives of workers in the agricultural sector were significantly affected. Fortunately, as the COVID-19 pandemic was brought under control, global value chains began to recover, and the production and business operations of enterprises and workers were reinstated. This development helped alleviate some of the difficulties faced by workers, leading to a more positive change in their incomes. However, the pace of recovery and workers' ability to adapt to the new context still fall short of expectations and do not fully utilize the sector's available potential.

For these reasons, the study of employment and income recovery for workers is important both theoretically and practically, especially in assessing the changes and adaptations made by workers after the pandemic. This research takes a new approach by focusing on the micro-level experiences of workers themselves, specifically in the agricultural sector, which was the most affected area during the COVID-19 outbreak in Vietnam. The findings of this study will provide a foundation for proposing practical solutions aimed at improving the employment and income situations of workers in the post-COVID-19 context during this adaptation and recovery period.

2. Literature Review

Income and employment are topics of significant interest to both researchers and policymakers due to their importance in socio-economic development. A country's economy tends to grow when its workforce is strong. Stability in income and employment for all segments of the labor force contributes to social security and promotes overall socio-economic development^[5,8]. Recent changes in the global context have greatly impacted workers' income and employment. Studies have demonstrated the negative effects of the COVID-19 pandemic on workers' livelihoods, highlighting it as an external factor affecting their income. These studies commonly employ the sustainable livelihood analysis framework to evaluate the pandemic's impact on workers^[2,9,10]. The mechanisms by which the COVID-19 outbreak affected workers' income and employment align with previous research. The pandemic created significant operational challenges for businesses, which are essential for job creation. When companies face difficulties, their production and operational activities are directly impacted, resulting in reduced output and potential closures. Consequently, these closures or scaled-back operations result in fewer working days and hours, as well as decreased wages, ultimately diminishing employment opportunities and workers' income^[11,12]. The challenges faced by workers impose a burden on their lives and social security systems as a whole.

Various factors influence workers' income and employment. Research has reached a consensus that the impact of these factors on workers' income and employment differs in level and direction. In different contexts, employment is also considered a factor that affects workers' income^[13-17]. These studies commonly utilize the sustainable livelihood analysis framework established by DFID in 1999^[6]. Influencing factors are categorized according to the groups of livelihood resources, which allows for specific quantification regarding their effects on workers' income. Variables that are frequently considered when measuring the impact of these factors on income include gender, education level, job position, personal investment of workers, and participation in social organizations^[4,18-21]. The studies agree that gen-

der impacts workers' income and employment. Additionally, job position also plays a significant role, as different positions correspond to varying income levels. Moreover, workers' educational attainment influences their income; those who receive training and possess the skills and knowledge required for their positions are likely to earn higher incomes and vice versa.

A research direction has been established to evaluate the livelihood losses experienced by workers due to adverse factors, specifically natural disasters and epidemics. When these adverse factors occur, they have a direct impact on workers' resources, with income and employment being two critical aspects of their human and financial resources^[13,22-25].

The study's overview indicates that income and employment are influenced by various factors, as well as the individual's living context. This research will build on previous studies that have utilized surveys to collect data from workers, aiming to quantify the impact of various factors on their income levels. However, this study will specifically focus on the recovery of income and employment among workers by comparing fluctuations in these areas during the COVID-19 outbreak with the period after the pandemic has been controlled. This comparison will help assess the recovery of workers' income and employment. Additionally, the study will quantify the impact of various factors on workers' income, providing direct recommendations to support the improvement of their income in the new context.

Additionally, the study will focus on examining the recovery of workers in the agricultural sector, a unique production area. Agricultural production is influenced not only by subjective factors but also by objective ones, such as weather conditions, farming practices, and external influences that can affect workers' income. The agricultural sector was particularly impacted by the COVID-19 outbreak, leading to difficulties in selling agricultural products and generating income for workers. As a result, their earnings were significantly affected. Consequently, it is important to study how agricultural workers are recovering from the impacts of COVID-19 and how they are adapting to a "new context" as the pandemic is controlled. This includes analyzing changes in their income and overall situation in the sector.

3. Methods

3.1. Data Collection Methods

The data used in this study were collected through a survey of workers employed in the agricultural sector in Vietnam, using a standardized questionnaire. The survey instrument was developed based on two official forms published by the General Statistics Office: The Population Living Standards Survey^[6,26]. The questionnaire was structured into two main sections: (i) Part 1 collected sociological information about the respondents, including demographic and occupational characteristics, and (ii) Part 2 gathered data on workers' income and employment conditions during the COVID-19 outbreak and after the pandemic was brought under control.

Survey Subjects: The study surveyed workers in Vietnam's agricultural sector, focusing on those who were most affected by the COVID-19 pandemic. Therefore, this study specifically targeted workers in these sectors to assess the recovery levels of employment and income following the pandemic.

Survey Sample Size: According to Thang^[27], a minimum sample size of 100 observations is necessary to conduct statistical calculations. To ensure an adequate number of observations, this study surveyed 750 workers across three major economic centers in Vietnam, representing the country's three regions. Specifically, the survey included survey research with 250 workers working in Bac Giang province (This is a province with famous agricultural products of Northern Vietnam, such as Luc Ngan litchi, Hong Giang orange, and agricultural cooperatives); 250 workers working in agricultural sector in Lam Dong province (Lam Dong province is famous for agricultural products combined with agricultural tourism in the Central and Central Highlands regions, the development of agriculture in the di-

rection of specialization and application of high technology has created a separate brand for Lam Dong province with famous agricultural products such as agricultural products, flower gardens, high-tech vegetables) and survey research was conducted with 250 workers in the agricultural sector in Kien Giang province (Kien Giang is one of the largest rice granaries in Vietnam and represents the Southern region of the country).

After distributing 750 survey forms, the study received 616 completed responses, which corresponds to a response rate of 82.13%. This total of 616 responses provides a sufficient number of observations to meet the minimum sample size required for statistical analysis.

Survey Implementation Time: The study was conducted from October to December 2024.

3.2. Data Analysis Methods

The study utilizes the collected data to apply the POOL OLS regression model and the T-test to assess the recovery of employment and income among workers after the COVID-19 pandemic.

For the T-test, this method is employed to analyze the difference in workers' income at two distinct times: during the COVID-19 outbreak and after the pandemic. This comparison serves as a foundation for evaluating the recovery of workers' incomes following the pandemic.

The POOL OLS regression method is used to quantify the influence of various factors on workers' income post-COVID-19. By employing this method, the study aims to identify both the direction and magnitude of the impact of these factors. The findings will provide a basis for recommending strategies to help workers adapt and improve their income in a more positive direction as the COVID-19 situation is fully controlled. The specific variables utilized in the study are also detailed (**Table 1**).

Table 1. Variables Used in the Research Model.

Variable Name	Notation	Explanation	Rationale for Variable Selection
Dependent Variable			
Income of the employee	Y	This is a scale used to measure the income of workers per year; income is calculated for each month and measured in units of million VND/worker/month.	[10,28,29]

Table 1. Cont.

Variable Name	Notation	Explanation	Rationale for Variable Selection
Independent Variable			
Gender of the employee	Gend	This is a scale that measures the gender of workers.	[11,18,19,30]
Educational background of the employee	Edu	Educational background is measured according to the training level of workers, who are trained at college (CD) and university (DH) levels, and the training level corresponds to the working position of workers in the research area.	[1,18,19,29]
Number of income-generating activities of the employee	Nincom	This is a scale used to count the number of jobs/activities that generate income for workers in the agricultural sector. Workers can take on multiple income-generating jobs to improve their living standards and income.	[11,12]
Covid 19	Covid19	This is a dummy variable to measure the impact of COVID-19 on workers' income. During the COVID-19 period, it will be coded as 1, and without COVID-19, it will be coded as 0	[1,2]
Work experience of the employee	Exper	This is a variable measuring the number of years a worker has worked in the agricultural sector.	[2,11]
Living expenses of the employee	Cost	This is a variable that measures the monthly living expenses of workers, the unit of measurement is million VND/person/month.	[18,23,25]
Personal investments of the employee	Invest	This is a variable that measures the amount of money invested by workers to generate workers' income, the unit of measurement is million VND.	[2,11]

4. Results

The descriptive statistics of the variables used in the study are shown in **Table 2**.

Table 2. Descriptive Statistics.

		Count	Column N %
Gend	Female	488	79.2%
	Male	128	20.8%
Edu	CD	246	39.9%
	DH	370	60.1%
Nincom	1.0	328	53.2%
	2.0	104	16.9%
	3.0	122	19.8%
	5.0	39	6.3%
	6.0	23	3.7%
Covid19	.0	308	50.0%
	1.0	308	50.0%

Source: Author's calculations from survey data, 2024.

The research findings indicate that, among the 616 workers surveyed, 488 are female and 128 are male. Notably, approximately 53.2% of these workers engage in only one income-generating activity, underscoring their dependence on a single source of income. This reliance suggests that, in the event of a COVID-19 outbreak causing business or production closures, workers' livelihoods would be severely affected, with limited or no alternative means of financial support. For workers in the agricul-

tural sector in Vietnam, most of them rely on available labor to generate income and supply agricultural products, thereby enhancing their earnings. Specifically, those who concentrate on fruit tree cultivation or rice farming typically have only one source of income from selling these products in the market. This lack of supplemental income creates challenges for workers, especially during incidents such as the COVID-19 epidemic outbreak. Currently, there are not many supplementary jobs available for workers alongside their primary employment. Only about 16.9% of workers engage in two or more income-generating activities, while approximately 19.8% have three or more. Among those in the agricultural sector, additional income typically comes from financial investments, part-time jobs, or seasonal work in logistics and agricultural product processing. However, the income generated from these supplementary activities tends to be unstable and is heavily influenced by labor market demands and the seasonal nature of agricultural products. For instance, during the lychee harvest, workers often take on temporary jobs picking lychees, which are paid on a daily basis. These positions typically last between two to four weeks, depending on the lychee season. Unfortunately, such jobs do not provide consistent income and highlight the specific challenges faced by workers in the

agricultural sector. Additionally, agricultural service sector workers may collaborate with partners or other organizations to offer services related to agricultural tourism. However, like other supplementary jobs, this work is not long-lasting due to the seasonal availability of agricultural products. While providing these additional services

can generate income, it does not ensure stable earnings throughout the year for workers. Therefore, there is a pressing need for more stable income-generating activities for those in the agricultural sector.

The variables of work experience, personal investment, and employee spending are listed in **Table 3**.

Table 3. Descriptive Statistics of the Variables: Work Experience, Personal Investment, Living Expenses, and Income of the Surveyed Subjects.

Items	Covid19			
	.0		1.0	
	Mean	Standard Deviation	Mean	Standard Deviation
Exper	5.367	3.621	6.367	3.621
Invest	34.307	43.346	31.069	40.960
Cost	7.026	3.223	4.771	2.439
Y	18.569	10.782	5.943	5.368

Source: Author's calculations from survey data, 2024.

Descriptive statistics indicate that agricultural sector workers possess experience in their job roles, as evidenced by the number of years of experience they have.

An examination of income-generating activities among workers reveals that approximately 46.88% of the workforce engages in two to five such activities. This suggests that, beyond their primary employment in the agricultural sector, many workers take on additional roles to supplement their income. Among these activities is personal investment, typically referring to individuals' financial investments made using their available funds. Statistical data reveal that during the COVID-19 outbreak, the average personal investment was about 31.069 million VND per person. In the post-COVID-19 period, this amount increased to approximately 34.307 million VND per person. There is a notable difference in workers' incomes between the COVID-19 outbreak and the subsequent recovery phase. Following the control of the COVID-19 pandemic, the income of the surveyed workers showed a significant improvement, with an average monthly income of approximately 18.569 million VND per person. This is substantially higher than the average income during the outbreak, which was around 5.943 million VND per person per month. The findings of this research align with statistical reports highlighting the positive changes in workers' income following the COVID-19 outbreak, as reported by the General Statistics Office^[7,26,31].

The working experience of workers, particularly in

the agricultural sector, has a well-defined significance due to the nature of agricultural production. Beyond the application of science and technology, experience in this field enables workers to recognize specific phenomena related to agricultural production, allowing them to apply their knowledge and effectively tackle practical issues. Survey results indicate that having experience in the production sector positively impacts workers' income. All respondents have either production or business experience or have held their respective positions for at least 5 to 6 years. The findings also confirm that this level of work experience is sufficient for workers to thoroughly understand their jobs, while also providing enough time to assess changes in income and employment within the research area, specifically by comparing the periods before and after the COVID-19 outbreak control. Test Results on the Difference in Workers' Income During and Post-COVID-19 is presented in **Table 4**.

The Independent Samples test results show that the Sig. Coefficient -0.000, suggesting that the model is statistically significant. The Mean Difference test results indicate a difference of -12.627 in income between workers during the COVID-19 period and those in the post-COVID-19 period. This difference highlights the negative impacts of COVID-19 on workers, particularly in the agricultural sector. However, the findings also reveal positive fluctuations in workers' incomes after COVID-19, demonstrating the adaptability and resilience of households and workers in the agricultural sector as they ad-

just their livelihood strategies to cope with these income changes.

Table 4. Independent Samples Test.

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Y_A (covid 19 – post covid 19)	Equal variances not assumed	477.528	0.000	-18.399	614	0.000	-12.627	0.686

Source: Author's calculations from survey data, 2024.

The results of the test analyzing income differences among workers in the agricultural sector during and after the COVID-19 outbreak revealed significant disparities between the two periods. During the COVID-19 outbreak, workers' income was considerably lower, with a difference of approximately -12.627 million VND compared to after the outbreak. This indicates that the income of agricultural sector workers was severely impacted by the pandemic, with many individuals losing their jobs and, consequently, their sources of income, which created significant hardships for them. However, as COVID-19 was brought under control and the agricultural sector began to recover in early 2023, the lives

of these workers started to stabilize. The survey findings are consistent with the reality experienced by the research team during the COVID-19 pandemic. During this period, workers in the agricultural sector struggled to sell their products. As a result, many workers faced significant income losses; approximately 50% of those surveyed relied on a single source of income. When COVID-19 disrupted consumption activities, it had a direct negative impact on their earnings. This explains the substantial difference in income levels observed between the two periods.

The level of influence of factors on workers' income after COVID-19 is quantified in **Table 5**.

Table 5. Model Estimation Results.

Items	Standardized Coefficients (Beta)	T P > z	Sig.
1.covid19	-2.974942	-9.18	0.000
Gend			
Male	-.3018765	-1.37	0.170
Edu			
DH	-2.725269	-23.89	0.000
Exper	-0.1898532	-2.19	0.029
Nincom	3.415349	31.97	0.000
Invest	0.05822	15.55	0.000
Cost	1.4525	9.11	0.000
_cons	-0.7608887	-2.23	0.026
R-sq	0.9870	Random-effects	GLS regression
Wald chi2(7)	69799.97	Number of obs =	616
Prob > chi2	0.000	Number of groups =	308

Source: Author's calculations from survey data, 2024.

The model estimation results indicate that all variables in the research model are statistically significant at the 5% significance level. The coefficients in the model, when testing its suitability, are relatively good, with a coefficient R-sq of 0.9870 and a Prob > chi2 of 0.000. Furthermore, the findings demonstrate that COVID-19 has

had a negative impact on workers' income, with a standardized coefficient (Beta) of -2.974942. This adverse effect is attributed mainly to reduced working hours and rising unemployment rates among workers, which directly diminish their earnings. These results are consistent with prior studies, including those conducted

by Qian and Fan^[25] and Dao et al.^[26]. When COVID-19 broke out, agricultural production and consumption activities were suspended, similar to other industries. As a result, workers experienced a cash flow shortage, which negatively impacted their income. During a survey conducted in Bac Giang province, Vietnam, the research team observed that workers in this area faced challenging circumstances. Most of these workers relied heavily on income from seasonal fruit products, such as Luc Ngan lychee and Hong Giang orange. These special products are harvested only once a year during a very short period, typically lasting about 2 to 3 weeks, and are primarily purchased by Chinese traders or consumed directly locally. When the COVID-19 epidemic broke out, international trade faced significant challenges. Workers struggled to consume products, and cooperatives also found it difficult to sell their goods. In response, the government implemented measures to promote domestic consumption and organized logistical support to transport and supply products to local markets. However, the economic outcomes during this period were not as favorable as in pre-epidemic times. The research findings from the research group align well with both the current situation and the results of previous research conducted on this topic^[2,12].

Regarding the number of income-generating activities, this variable is found to have a positive relationship with workers' income. This finding aligns with the research conducted by Quyet Thang Dao, Thi Yen Le, and Van Hung Pham^[26]. The assumption is that as workers engage in more income-generating activities, their overall income will increase. The estimated coefficient of the Standardized Coefficients (Beta) model is 3.415349, indicating that workers in the agricultural sector are quite proactive in creating opportunities to enhance their earnings. This also contributes to the stability of their livelihoods. Furthermore, having a variety of income-generating activities helps minimize risks and challenges for workers, especially in the face of unexpected events. The COVID-19 pandemic serves as a prime example of the difficulties that workers may encounter. However, balancing additional jobs alongside their primary roles as agricultural workers is challenging due to the nature of their living conditions. How-

ever, for those employed in the agricultural service sector, who provide products and services or work for farming cooperatives, accessing scientific knowledge and technology, as well as supplementary job opportunities, tends to be easier; the opportunity to have more jobs created is also greater. Currently, approximately 50% of workers rely solely on a single source of income from agricultural work. These individuals typically live in rural areas, where it is challenging to find additional employment opportunities. This situation highlights the need for further examination and the development of solutions to diversify the livelihoods of workers in this group.

Similar to the number of income-generating activities, personal investment has a significant impact on income and serves as a key source of earnings for workers during periods of work interruption and reduced hours, particularly in the context of COVID-19. Workers frequently opt to invest in stocks, real estate, or online businesses through e-commerce platforms. These investment activities positively influence workers' income. Research findings indicate that the standardized coefficient (Beta) for the personal investment variable is 0.05822, which reflects the substantial value that private investment contributes to workers' income. The results of this study support the views expressed by Quyet Thang Dao, Thi Yen Le, and Van Hung Pham^[12].

The study also highlighted the impact of various factors, including personal spending, education level, gender, and work experience, on workers' income. However, the study did not conduct an in-depth analysis of the level of influence of these factors. Instead, it focused on examining the impact of factors that contributed to income differences among workers during the COVID-19 outbreak and in the post-COVID-19 period. The results indicate that the influence of various factors aligns with previous views. Specifically, in certain fields, such as agriculture, the level of labor does not appear to be the decisive factor in determining income. Instead, factors such as experience and other external elements have a greater impact on the income of agricultural workers. Conversely, in the agricultural sector, the level of labor positively affects workers' income. Additionally, there is a positive relationship between labor spend-

ing and labor income; when income is high, personal spending tends to increase, and vice versa. This correlation is especially evident during the COVID-19 outbreak when many workers faced income reductions. During this time, workers tended to minimize spending on non-essential items and focused only on purchasing essential goods. This behavior reflects how personal spending influences workers' income in the agricultural sector^[18,23,25,29].

5. Discussion

The study's finding highlight the negative effects of external factors, particularly disease outbreaks, on workers' income and employment. Based on these results, the study puts forward several recommendations aimed at providing workers with improved livelihood options and enhancing their ability to adapt to changing circumstances.

First, workers should diversify their income-generating activities. While their main sources of income are still the most important, workers need to develop new skills and strategies to create additional livelihoods for themselves and their families. By diversifying their income streams, workers can better withstand unfavorable situations, such as job interruptions caused by force majeure events like epidemics or natural disasters. This approach allows them to maintain stability in their lives.

Second, personal investments have demonstrated a modest but positive impact on income. Workers should consider enrolling in training courses to learn about small-scale personal investment programs that can create new cash flows. This approach also serves as a means to diversify workers' livelihood strategies.

Third, workers must enhance their knowledge and skills in research. As deep economic integration progresses, competition between domestic and international workers, particularly in the agricultural sector, is intensifying. If workers fail to meet job requirements, it may result in unemployment, which will negatively impact their income.

Fourth, the study recommends that state management agencies implement special support policies for

workers in the agricultural sector. This group is particularly vulnerable to negative changes, as illustrated by the outbreak of the COVID-19 pandemic, which had a significant impact on agricultural sector workers compared to others. To assist these workers, it is important to provide opportunities and support for training in relevant knowledge and skills. Additionally, offering partial financial support or incentives for personal investment can help workers diversify their livelihood strategies and sources of income.

Fifth, enterprises and employers should develop plans to ensure a minimum level of welfare for employees and support them in minimizing difficulties during unexpected fluctuations caused by external factors.

6. Conclusion

The study examined the differences in income and employment among workers during and after the COVID-19 outbreak, specifically focusing on those in the agricultural sector. It quantified the influence of various factors on workers' income and found that certain elements, such as the number of income-generating activities and personal investment, had a significant positive impact on their income. While the recovery of workers' income was evident, the study only analyzed the situation from the perspective of agricultural sector workers. It did not compare the adaptability and recovery of workers across different sectors, which is a limitation of the research. This presents an opportunity for future studies to explore the recovery across all sectors.

Author Contributions

Conceptualization, T.T.C.U. and M.T.P.; methodology, T.T.C.U.; software, T.T.C.U.; validation, T.T.C.U. and M.T.P.; formal analysis, T.T.C.U.; investigation, T.T.C.U.; resources, T.T.C.U.; data curation, T.T.C.U.; writing—original draft preparation, T.T.C.U.; writing—review and editing, M.T.P. and T.T.C.U.; visualization, M.T.P.; supervision, T.T.C.U.; project administration, M.T.P. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors have no competing interests to declare that are relevant to the content of this article.

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