

Reviewer A

Review Details: The impact of Covid-19 pandemic on Aglaonema farming income: a comparison between the height and the post trend

Once this review has been read, press "Confirm" to indicate that the review process may proceed. If the reviewer has submitted their review elsewhere, you may upload the file below and then press "Confirm" to proceed.

Completed: 2023-01-12 03:31 PM

Recommendation: Revisions Required

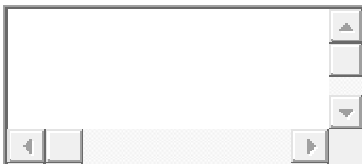
Manuscript ID (number):*

2575

1. Is the English language of sufficient quality?*

- Yes
- No

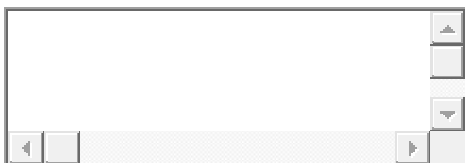
Suggestion:



2. Do you have any knowledge of this publication or part of it being published/considered in another journal? *

- Yes
- No

Comments:



3. Is the title adequate? Does it reflect the content clearly?*

- Yes
- No


Suggestion:



4. Is the introduction well structured? *

- Yes
- No


Comments:



5. Are the methods sufficiently detailed and described? *

- Yes
- No

Comments:



6. Are the results well discussed (and not just presented)? *

- Yes
- No

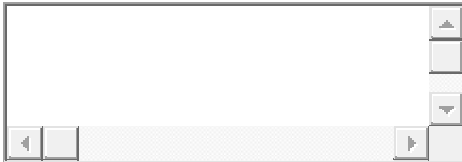
Comments: The material and methods is very shallow. You must discuss deeply, in detail, the selection process of literature, interviewed and primary and secondary source of data. The reader needs to have information to replicate your research.



7. Is the quantity and quality of the figures and tables satisfactory?*

- Yes
- No

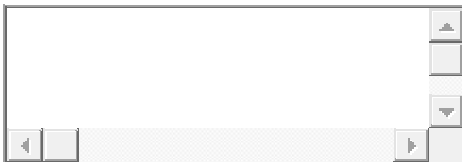
Comments:



8. Are the references relevant, adequate and with recent publications in the majority (at least 60% according to the journal's guidelines)?*

- Yes
- No

Comments and or suggestion of alternative literature:



9. Please provide scores to the following criteria (1 is weak and 5 is excellent)

- Novelty

*

- 1
- 2
- 3
- 4
- 5

○ Scientific rigor

*

- 1
- 2
- 3
- 4
- 5

○ Relevance to the area

*

- 1
- 2
- 3
- 4
- 5

○ Text/grammar appropriateness

*

- 1
- 2
- 3
- 4
- 5

- Overall quality

*

- 1
- 2
- 3
- 4
- 5

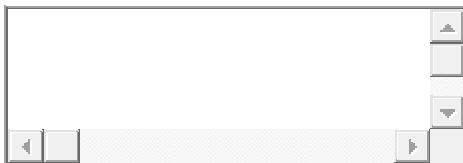
10. Based on your comments, assign your recommendation: *

- Accept
- Minor review
- Major review
- Reject

11. Please provide a detailed review report to the editor and author. (Add as many comments as you judge necessary)

- **Confidential Comments to the Editor**

*



- **Comments to the Author** (Please comment the positive and the negative aspects of the article. Make your comments according the above questionnaire)
- This article deserves publication, however, it is necessary to make some adjustments. Some recommendations are available in the body of manuscript. Concerns material and material and method, this topic is unclear and shallow.



Reviewer Files

- [Search](#)

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Name

Date

[Settings](#) [2575-Texto do Artigo-18377-16303-2-20221210 RV-RP.docx](#) January 12, 2023

Recommendation Set or adjust the reviewer recommendation.

▼

Reviewer D

Review Details: The impact of Covid-19 pandemic on Aglaonema farming income: a comparison between the height and the post trend

Once this review has been read, press "Confirm" to indicate that the review process may proceed. If the reviewer has submitted their review elsewhere, you may upload the file below and then press "Confirm" to proceed.

Completed: 2023-02-17 12:14 PM

Recommendation: Revisions Required

Manuscript ID (number):*

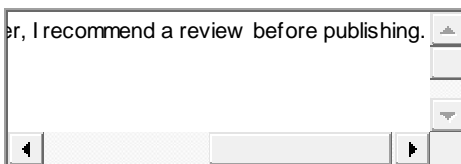
2575

1. Is the English language of sufficient quality?*

- Yes
- No

Suggestion:

er, I recommend a review before publishing.

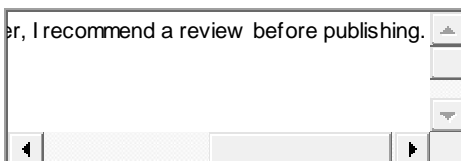


2. Do you have any knowledge of this publication or part of it being published/considered in another journal? *

- Yes
- No

Comments:

er, I recommend a review before publishing.

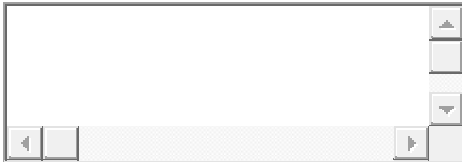


3. Is the title adequate? Does it reflect the content clearly?*

- Yes

- No

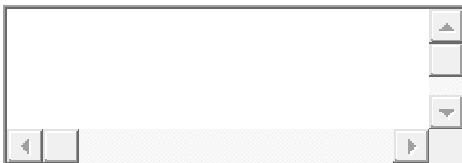
Suggestion:



4. Is the introduction well structured? *

- Yes
- No

Comments:

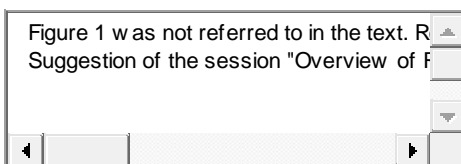


5. Are the methods sufficiently detailed and described? *

- Yes
- No

Comments: Figure 1 was not referred to in the text. Recommendation to insert the call in the paragraph immediately preceding its insertion.

Suggestion of the session "Overview of Research Locations and Objects" to be inserted in the material and methods, because it is a presentation of the place of study.



6. Are the results well discussed (and not just presented)? *

- Yes
- No

Comments: Figure 1 was not referred to in the text. Recommendation to insert the call in the paragraph immediately preceding its insertion.

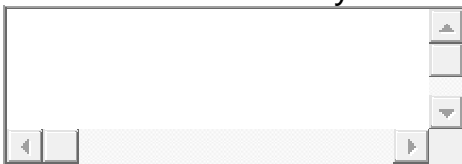
Suggestion of the session "Overview of Research Locations and Objects" to be inserted in the material and methods, because it is a presentation of the place of study.



7. Is the quantity and quality of the figures and tables satisfactory?*

- Yes
- No


Comments: Necessary to check the values in table 1 and 4



8. Are the references relevant, adequate and with recent publications in the majority (at least 60% according to the journal's guidelines)?*

- Yes
- No

Comments and or suggestion of alternative literature:



9. Please provide scores to the following criteria (1 is weak and 5 is excellent)

- Novelty

*

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- 2
- 3
- 4
- 5

○ Scientific rigor

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- Overall quality

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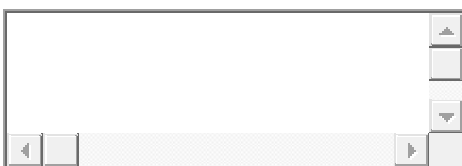
10. Based on your comments, assign your recommendation: *

- Accept
- Minor review
- Major review
- Reject

11. Please provide a detailed review report to the editor and author. (Add as many comments as you judge necessary)

- **Confidential Comments to the Editor**

*

A rectangular text input field with a light gray border. On the right side, there are two vertical scroll arrows (up and down). At the bottom, there are two horizontal scroll arrows (left and right). The field is currently empty.

- **Comments to the Author** (Please comment the positive and the negative aspects of the article. Make your comments according the above questionnaire)
- The article presents an important discussion related to the rural economy of Aglaonema farmers during the pandemic period and after the pandemic. This fact confers originality and relevance to the area of economics. However, it lacks an english revision.
- In addition, it is necessary to review the data presented in tables 1 and 4, considering that the sum differs from the presented values.
- I also recommend further discussion of the data presented, especially regarding the characterization of the respondents.
- Comments have been inserted into the file.



Reviewer Files

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Name

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Date

February
17, 2023

Recommendation Set or adjust the reviewer recommendation.

Revisions Required

Technical Article

The Impact of Covid-19 Pandemic on *Aglaonema* Farming Income: A Comparison Between The Height and The Post Trend

Abstract

The expansion of the COVID-19 pandemic from 2019 to 2021 has weakened the performance of critical industries in Indonesia. *Aglaonema* as one of the ornamental plants had a surge in demand as part of the farming industry until they height in 2020. Currently, the response to the demand for ornamental plants has declined considerably. This study discussed (1) the revenue and income of *aglaonema* farming during two periods, at height and the post of the COVID-19 pandemic, and (2) analyzed the distribution of inputs data as information related to the allocation of production. The respondents comprised 32 active farmers from the *aglaonema* community (ASA) in Depok City, who produced 10 varieties of premium *aglaonema*, namely Super Pink, Suksom Jaipong, Khanza, Lotus Delight, Audrey, Tiara, Widuri, Adelia, Bidadari, and Pride of Sumatra. The data was collected from June to November 2022 using the recall method to tabulate data in 2020 (the year of the height of COVID-19 pandemic) and 2022 (the year of the post COVID-19 pandemic). The R/C ratio was used as a profits indicator by considering the implicit and explicit costs. The findings revealed that *aglaonema* farming in Depok City was highly profitable at the height of the COVID-19 pandemic, evidenced by an R/C ratio of 7,50. The R/C ratio has changed in value to 1,79, indicating a decline in farming profitability. Suppose the farmers pay the implicit costs in the current situation, the farming becomes less profitable as shown by the return value which is just slightly above the break-even point.

Keywords: *Aglaonema*; COVID-19; Income; Comparison; Ornamental Plants.

Resumo

Introduction

The propagation of the COVID-19 virus has a global effect on communities, and it impacts not only health but also economic, social, environmental, and political aspects. Affected sectors include commerce, agriculture, fisheries, and other sectoral or non-sectoral investment sectors. Due to the COVID-19 pandemic, the industrial sector, which underpins the Indonesian economy, has also experienced instability, impacting agriculture, forestry, and fisheries to be the mainstay for other sectors. According to Central Statistics Agency (2020) statistics, agriculture, forestry, and fisheries were the third-largest contributors to the Gross Domestic Product (GDP) in 2019. Their combined contribution was 12,27%. Significantly, as

many as 34,5 million persons of productive age are employed in this area.

Ornamental plants are horticultural subsector plants whose crown shape, leaves, color, scent, and flowers have aesthetic value. An expanding production trend in ornamental plant cultivation characterizes the development of ornamental plant agribusiness (Bulgari et al., 2021). The global demand for ornamental plants tends to increase by 3,9% annually (Gabellini & Scaramuzzi, 2022). Principal consumers of ornamental plants include the United States and Europe, which import them on average from Southeast Asia. *Aglaonema* from Southeast Asia is favored due to its relatively lower price and greater species diversity, including the hybrids (Khofifah et al., 2022). Indonesia, whose 27.500 ornamental plant species represent 10% of the world's total ornamental plant variety, might capitalize on this opportunity as a country with a rich biodiversity. Along with the growth of technology and social media, ornamental plant production has become more lucrative. Decoration, landscaping, parties, and other ceremonial activities have utilized ornamental plants.

Aglaonema, an ornamental pot plant pioneer in Indonesia, has become an essential source of farmer revenue. The aesthetic desires that arose from hobbyists' to become a commercial enterprise. *Aglaonema* production has considerably grown and decreased (Khofifah et al., 2022). Short-term volatility occurred, followed by a fall in output in January and June and an increase in production in September and December. The Price of *aglaonema* tends to rise, particularly between 2015 and 2020. The phenomenon of the highest price of *aglaonema* occurred at the end of 2020, at the height of the COVID-19 pandemic.

[R1] Comentário: This information refers to which year?

Aglaonema production frequently falls short of market requirements. It is relatively difficult to estimate the demand trend for ornamental plants, particularly concerning the desire for hobbyists and decoration service providers (Khofifah et al., 2022). Farmers must also carefully and efficiently handle their products. The term 'efficient' denotes that the utilization of these resources must yield outputs with fewer inputs.

Utilizing production facilities efficiently is typically the primary issue challenge in the *aglaonema* business. A case study in ornamental farming demonstrated a failure that was caused by a limitation of land for cultivation, low labor productivity, high incidence of disease attacks, and an inability to utilize inputs efficiently (Tiasmalomo et al., 2021). Farmers with low management abilities typically send the offer to customer for varieties with excellent resistance, such as *red lipstick*, *donacarmen*, and *big roy*, but provide vary low prices. Farmers only handle high-end varieties (namely *aglaonema* collections) if they have better experience and understanding of nursing management. This type of farmers also benefited the high value of price during the rising of sales for those varieties.

This study examined a group of farmers who have capitalized on the dynamism of the *aglaonema* trend to obtain high profits. The analysis of *aglaonema* farming discussed (1) the source of income data to measure whether the farming operation is profitable or detrimental and (2) learning allocation data of manufacturing inputs in terms of quantity and expenditure. Analysis of *aglaonema* farming was developed by presenting calculations at a single occurrence point, namely the COVID-19 pandemic. The accounting outcomes for these two events were subsequently explicitly analyzed and interpreted. This discussion focused on the performance and dynamic changes in *aglaonema* farming in Depok City when the Covid-19 pandemic heightened in 2020 and diminished in 2022.

MATERIAL AND METHOD

The study was carried out in Depok city as one of the ornamental plants source in major cities in Indonesia. This study's population consists of farmers who are members of a community called *Aglaonema* Nusantara Association (ASA) Depok City, as much as 53 farmers. The research objects to 10 (ten) superior types of *aglaonema* that demonstrated a rising trend at the height of COVID-19 pandemic, including *Super Pink*, *Suksom Jaipong*, *Khanza*, *Lotus Delight*, *Audrey*, *Tiara*, *Widuri*, *Adelia*, *Bidadari*, and *Pride of Sumatra*.

[R2] Comentário: Figure 1 was not referred to in the text. Recommendation to insert the call in the paragraph immediately preceding its insertion.

Tabel 1. The Two Popular Types of Aglaonema; Suksom Jaipong and Lotus Delight

[R3] Comentário: Tabel or Figure 1?

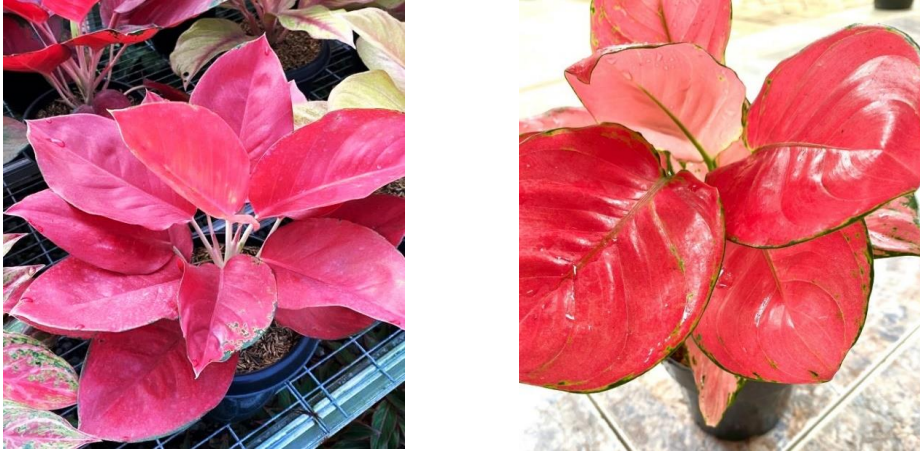


Figure 1. a) Suksom Jaipong, b) Super Pink

This paper examined primary and secondary sources of data. Primary data were processed systematically by gathering observations using the recall method and interviews with a list of questions (questionnaires). Secondary data was gathered from various literature from books, scientific works, research reports, and data from Central Statistics Agency (BPS), the Department of Food Crops, Horticulture and Plantation of Depok City, and else. This research utilized descriptive analysis and particularly analyzed the results of field observations, interviews, and secondary data searches.

Data Analysis

This study's data were descriptively and quantitatively analyzed. Age, background, farming experience, occupation, *et cetera.*, are discovered by descriptive analysis. The quantitative analysis of *aglaonema* farming included costs, revenues, and profits.

Revenue is calculated using the following formula:

$$TR = \sum_{i=1}^n Y \cdot Py$$

Where :

TR = Total Revenue (IDR)

Q = Quantity of sales (IDR)

P = Price per variety (IDR/pot)

Farming costs are calculated using the following formula:

$$TC = FC + VC$$

Where :

TC = Total Cost (IDR)

FC = Fixed Costs (including the amount of explicit and implicit fixed costs) (IDR)

VC = Variable costs (including the amount of explicit and implicit variable costs) (IDR)

The Total Cost (TC) is the amount of all production inputs costs, including fertilizers, insecticides, planting media, labor, depreciation, *et cetera*. The requirement is accomplished by multiplying the number of uses by its price, whereas the analysis focuses on certain variables. Certain variables, like labor and depreciations, were analyse first using a specific formula. The labor is measured in man-day units before being multiplied by the prevailing wages in the study area. The calculation of depreciation of equipment and buildings uses the straight-line depreciation model.

The total value of revenue will be divided by the total cost of farming to achieve the revenue-to-cost ratio, abbreviated as R/C. The R/C ratio is utilized as a benchmark for farming profits based on three criteria (Soekartawi, 2016). These three criteria serve as justifications for analysing study data.

- 1) R/C > 1 indicates that farming is profitable
- 2) R/C = 1 indicates the farm is at the break-even point
- 3) R/C < 1 indicates that farming is unprofitable

RESULTS AND DISCUSSION

Overview of Research Locations and Objects

[R4] Comentário: Results are well presented. However, there is a lack of discussion with other authors who research similar topics, mainly in the section "Characteristics of Respondents".

[R5] Comentário: Suggestion for this session to go to material and methods because it is a presentation of the place of study.

Depok City has a strategic location to cultivate *aglaonema* due to the adjacency to the market and consumers. Furthermore, this city provides suitable agronomic conditions for *aglaonema* by temperatures of 23 °C – 25 °C, humidity levels of 85% - 90%, wind speeds of 0-20 km per hour, and rainfall of 1.106 mm to 4.579 mm/year. It brings purposeful benefits that have a direct impact on plant growth.

The *Aglaonema* Nusantara Association (ASA) Depok is responsible for *aglaonema* farming in Depok City. ASA comprises *aglaonema* cultivators from numerous backgrounds, including farmers, employees, sellers, and community households. This organization is divided into three levels: Central, Provincial, and City. This organization is spread throughout major cities around Indonesia, including Depok, Jakarta, and Yogyakarta.

ASA was created in response to the changes in the value of *aglaonema* sales during the Covid-19 pandemic. Farmers required an organization as a place for exchanging ideas and affiliating with others due to the sharp rise in demand. Furthermore, this organization is anticipated to reduce fraud, theft, and counterfeiting of *aglaonema*. The ASA aims to develop, promote, and improve the regeneration of farmers. This organization comprises some departments such as marketing, research and development, law, and public relations.

Characteristics of Respondents

The respondents of the study were classified based on age, education levels, farming experience, number of dependents, number of land, and status of land ownership. Following is an explanation of the characteristics of the respondents.

a. Farmer Age

The Central Statistics Agency determines the productive age of the labor, which ranges from 15 to 64 years. This period was crucial in agriculture since it affects physical strength at labor and cognitive abilities, particularly in adopting new technologies. The Minister for National Development Planning (2022) categorizes age into 7 groups that

called child, young, early working, the middle age, pre-retirement, retirement, and elderly – depending on their age. Farmers who grow *aglaonema* are classified in ‘young’ and ‘early working’ age. The labor in the ‘young’ group provides a technological acceptability edge, as seen by their expertise in promoting *Aglaonema* through social media. Younger laborers are not only more creative and innovative than their elder but also gain more power in any sales transactions.

[R6] Comentário: How old are the *aglaonema* farmers in the study? What is the age of farmers classified as "young" and "first years of work"? For the reader, it is important to present the numbers and age ranges for classification.

b. Education Level

Education level affects the mental state, attitude, and behavior of farmers. Cultivation knowledge is part of the natural sciences gained during schooling. The greater the level of education, the better their knowledge and critical thinking ability. According to the findings, no farmer had a low level of education. The percentage of farmers with a Senior High School diploma is 68,75%; while the remainder has a higher level of education. This distinguishes the character of farming in *aglaonema* field from other commodities, whose farmer typically come from a low education level.

c. Occupation

Farming is considered the be the main job if it can provide most of a farmer’s daily needs. *Aglaonema* cultivation can be relied upon as the main job for some farmers (60%). The other respondents privately view this farming only as a pastime and a side business. The average size of these farmers' plots of land was 188 m², yet their cultivation experience was relatively fair (an average of 6 years working on *Aglaonema*).

d. Farming Experience

Aglaonema is not the first commodity that farmers cultivate, indeed they have prior expertise in producing a wide range of ornamental plants. The experience in farming also affects the level of success in agriculture, as seen by its output results. Farmers that have long experience in growing *Aglaonema* typically possess a high level of knowledge,

experience, and skills for addressing any farming issues. Soeharjo and Patong (1999) stated that there are three categories of farming experience: less experienced, moderately experienced, and experienced. According to the data, most of farmers got experience, in average number of 9 years. Farmer's experience in growing *Aglaonema* is about 7 years.

e. Number of Dependent Family Members

The word 'dependent family' represents the large number of family members who still live in the same house with the patriarch. There are two categories of family based on their composition, i.e a big family and a small family. Regarding the cost structure of farming, numerous family members can be profitable because they can be employed as the unpaid labor called Family labor (TKDK).

According to data, *aglaonema* farmers in Depok City are classified as big family where most the households have 4 to 5 family members. The total number of dependents in the family, including parents and children, was determined. Typically, the family patriarch solicits assistance from family members to care for the existing *aglaonema* plants. In addition, family members were regarded to be better and more conscientious when it comes to obeying the instructions of the patriarch.

f. Land area

Land area is one of the essential aspects of growing *aglaonema*. The wider the managed land area, the greater the potential for producing results and the opportunity to create more significant revenue. *Aglaonema* was cultivated utilizing pots arranged in a greenhouse. The land area referred to in this study was the production house's size. The land area of *aglaonema* farmers was highly varied, ranging from 10 m² to 1,200 m², with an average of 197,53 m².

The land area category is divided into three groups: small farms (0 – 0,5 hectares), medium farms (0,5 – 2,0 hectares), and large farms (more than 2,0 hectares). Farmers

grow *aglaonema* in a small farming area, which is less than 0,5 hectares. However, growing *Aglaonema* does not require a large size of land like other commodities (such as crops and plantations). Because of its high adaptability in all regions, *Aglaonema* may suitable be a business product in urban areas since its consumers mostly come from middle-high income levels.

g. Land Ownership Status

There are two types of land ownership: private ownership and rental. Land ownership is tied to a farmer's income, affecting costs, revenues, and incomes. Farmers with land rental status have a lower income than farmers with owned status (Pasaribu & Istriningsih, 2020). The existence of payment obligations has increased farming expenses, hence decreasing the potential revenue. The land rental status is commonly given to large-scale commodity farming, like crops or plantations. *Aglaonema* cultivation in Depok City was performed by farmers who owned privately the land.

Cost Analysis

Expense analysis is performed on all components that reduce the value of farm income. Cost divided into the fixed cost and variable cost. The nominal value of fixed costs is the same for each production cycle and is unaffected by production volume, like depreciation and tax expenses. Variable costs are frequently referred to an expense that changes in proportion to how much a farming produces. Seeds, fertilizers, insecticides, and labor are examples of variable costs. The cost analysis of farming is presented in Table 1.

Tabel 1. Cost Structure in Growing *Aglaonema*

| Component | Post Pandemic (IDR) | The Height of Pandemic (IDR) | Percentage during Post Pandemic (%) | Percentage during Height of Pandemic (%) |
|-----------------------------|---------------------------|---------------------------------|--|---|
| Explicit Fixed Costs | | | | |
| Land tax | 52.458 | 52.458 | 0,20 | 0,15 |
| Seeds | 13.633.333 | 21.000.000 | 52,43 | 58,49 |
| Planting media | 1.028.281 | 1.992.000 | 3,95 | 5,55 |

[R7] Comentário: Need to check sums
[R8] Comentário: Need to check sums

| | | | | |
|---------------------------------------|---------------------------|---------------------------|--------|--------|
| External labor | 346.957 | 346.957 | 1,33 | 0,97 |
| Pots and ingredients | 244.152 | 1.309.015 | 0,94 | 3,65 |
| Fertilizer | 121.562 | 145.156 | 0,47 | 0,40 |
| Pesticide | 72.968 | 87.593 | 0,28 | 0,24 |
| Total Explicit Cost | 15.499.7 1143 | 24.933.1 7980 | 59,61 | 69,44 |
| Implicit Fixed Cost | | | | |
| Depreciation | 7.702.003 | 7.702.003 | 29,62 | 21,45 |
| Implicit Variable Costs | | | | |
| Seeds (vegetative propagation) | 1.616.666 | 2.083.333 | 6,22 | 5,80 |
| Family labor | 1.156.084 | 1.156.084 | 4,45% | 3,22% |
| Total Implicit Cost | 10.474.75 34 | 10.941.4 21420 | 40,33% | 30,50% |
| Total Explicit Cost and Implicit Cost | 25.974.4 68467 | 35.874.6 02601 | 100% | 100% |

Source: Primary Data (processed), 2022.

Variable cost forms based on production capacity, productivity, crop variety, and farmer technology. Both fixed cost and variable cost can be classified more as explicit and implicit costs. Explicit cost refers to the component which is purchased in cash; whereas, implicit cost is any cost that has already occurred without payment but is reported as a separate expense. The components of *aglaonema* farming on Table 1 are described as follows:

1. Land tax

The farmer is exempt from paying land taxes since he owns his land privately. The tax value is a kind of explicit cost and is computed under Tax Object Sales Value (NJOP). The NJOP is determined by comparing the costs of similar objects or new acquisition values. The value deemed by the state to be the property tax base (PBB). Farmers have to pay an annual land tax of 52.458 IDR every month.

2. Seeds

There are two strategies to receive seeds from *aglaonema* farmers in the city of Depok: by vegetative propagation or purchasing them. Seeds obtained through purchase are categorised as an explicit cost since farmers pay directly for them, while vegetative

propagation seeds are factored into the implicit cost. During the height of the pandemic, the total cost of seeds purchased was IDR 21 millions. The difference was quite significant between post pandemic and the height of pandemic, to wit IDR IDR 7 millions. At the height of the COVID-19 pandemic, there was a shortage of seeds due to high demand from new hobbyists, which drove up the cost of *aglaonema* seeds.

3. Planting Media

Aglaonema has a fair vitality, which refers to the capacity to live or grow in any media. The optimal growing media for *Aglaonema* are often formulated from a blend of such raw materials which contains high porosity. Farmers can purchase pre-mixed planting media or compose the ingredients by their own. Farmers in this study utilize a mixed planting material. The growing medium consists of toasted husks, cocopeat, and fern roots. The planting media is included in the explicit cost since farmers purchase all growing media components monthly. At the height of the epidemic, the total buy value was IDR 1,9 millions; however, after the pandemic, the purchase value of growth media declined since the purchase of seeds also decreased.

4. Labor

The labor employed in *aglaonema* farming consists of Family labor (TKDK) and External labor (TKLK). Family labor refers to the family members who help with any activities in farming but do not have significant wages. External labor is compensated based on the prevalent pay in the research region. Labor duties include preparing seeds, manufacturing planting media, planting or transplanting (repotting), applying fertilizers, vitamins, pesticides, maintaining the greenhouses, packing and delivering plants to customers. The cost of labor is gained by multiplying the absolute number of man-days with a certain amount of wages.

The labor structure for growing *Aglaonema* differs from the labor structure for other

horticultural products. The cost of external labor is generally more expensive than family labor for other farming types; however, the opposite happens for *aglaonema* farming. The characteristic of growing *aglaonema* is comparable to the types of growing flower plants, such as *chrysanthemum* farming (Selfiana, 2020) and other ornamental plants like Orchid Jasmin or Anthurium (Supiani & Sinaini, 2020). Family members are considered more tender in caring activities and flexible in working hours.

The unit of labor is measured by man-day (HOK). HOK is a unit used to calculate labor costs; its value for men is 1 and 0,8 for women. The labor is compensated on a daily and monthly basis. The wages paid to employees range between IDR 50.000 and IDR 150.000, depending on the nature of their employment. Tabel represents the labor utilization for *Aglaonema* cultivation in Depok City.

Table 2. Labor Use Allocation

| Component | The height of COVID-19 Pandemic | | | | Post COVID-19 Pandemic | | | |
|-------------------------------|---------------------------------|----------------|--------------------|--------------------|------------------------|----------------|--------------------|----------------|
| | Man-day | | Wage Expense (IDR) | | Man-day | | Wage Expense (IDR) | |
| | External Workers | Family Workers | External Workers | Non-Family Workers | External Workers | Family Workers | External Workers | Family Workers |
| Preparing Seed | 1,5 | 0,7 | 184.180 | 85.938 | 1,4 | 0,6 | 165.039 | 75.684 |
| Composing planting Media | 1,3 | 0,3 | 183.398 | 47.461 | 1,2 | 0,3 | 166.992 | 42.188 |
| Planting | 1,6 | 0,6 | 189.648 | 71.289 | 1,4 | 0,5 | 166.992 | 59.570 |
| Fertilizing | 0,7 | 0,1 | 66.875 | 14.211 | 0,7 | 0,1 | 66.875 | 14.211 |
| Applying pesticides | 0,5 | 0,1 | 52.246 | 10.867 | 0,5 | 0,1 | 52.246 | 9.195 |
| Taking care of the greenhouse | 1,0 | 0,2 | 46.936 | 10.242 | 1,0 | 0,2 | 45.867 | 10.242 |
| Packaging | 2,9 | 0,8 | 333.496 | 102.051 | 2,4 | 0,7 | 99.305 | 82.520 |
| Delivery | 2,1 | 0,1 | 99.305 | 4.898 | 2,1 | 0,1 | 75.684 | 4.898 |
| Total | 11,7 | 2,9 | 1.156.084 | 346.957 | 10,6 | 2,5 | 839.000 | 298.508 |

Source: Primary Data, (processed) 2022.

Table 2 reveals that packaging activities are the most time-consuming. Farmers must ensure that their product is not harmed in the way to customers; thus, packaging activities are critical. Applying fertilizers or vitamins requires the least amount of time. This

demonstrates that this plant does not require much nutrition levels. Pesticides are only used for prevention since specific illnesses that target *Aglaonema* are challenging to treat and can only be avoided.

5. Fertiliser/vitamins

It is essential to ensure that plants obtain enough sufficient nutrition to grow optimally. *Dekastar* and *osmocot* are the brands of fertilizers used by farmers. Since both fertilizers are kind of slow-release types, nutrients are gradually delivered into the growth media. This fertiliser is applied once every six months. There is a slight price difference between purchasing fertilizers at the height of the COVID-19 pandemic and post COVID-19 pandemic. At the height of pandemic, the cost of fertiliser procurement is higher than post pandemics, deliberately IDR 145.156 and IDR 121.562. The slight difference between the two periods was caused by the relatively stable price and low intensity of fertiliser usage. Under the conditions of the COVID-19 pandemic, the acceleration of plant sales significantly reduces the expenses of this activity.

6. Pest and disease control

Control of plant disease organisms (OPT) in *Aglaonema* is also essential since the disturbance of organisms' affects the plant's growth. Disturbances that usually occur are not only diseases and pests attacks, but also physiological disorders. The spread of bacterial stem rot caused by the bacteria *Erwinia carotovora* was controlled by spraying a fungicide, called *antracol*. *Mealybugs* were eliminated using *curacron* at a dose of 0,7 ml per liter of water. The cost of disease control during peak season was still affordable, even more, the high turnover of product stock causes the cost of pesticides to be reduced. At the peak of the COVID-19 pandemic, the cost of applying pesticides was IDR 87.593, a bit higher than in the post-pandemic which was IDR 72.968.

7. Depreciation

Depreciation is the diminution in the utility or value of assets and is categorized as a non-cash expense. Depreciation is calculated for production facilities such as watering can, machines, greenhouses, and building; except land. Land investment has no depreciation since its value rises yearly (Pasaribu & Istriningsih, 2020). Depreciation is classified as a fixed cost with a value of IDR 7 millions for both time usage.

8. Pots and packing materials

Pot is a variable expense whose amount varies depending on the amount of output. Direct purchases by customers have caused the consumption of packaging materials to be minimized. Cardboard boxes were only arranged for indirect purchases. Long-distance delivery required additional protection to protect the leaves during shipping. At the height of the pandemic, the price of pots and packaging materials was higher than its need in post COVID-19 pandemic. Farmers spent IDR 1,3 millions. for materials at the height of the pandemic and IDR 244.152 during post pandemic period.

Revenue Analysis

Farming revenue is a total sale of the ten *aglaonema* varieties. The amount of sold quantity and prices varied at the period of height and post COVID-19 pandemic. The following table demonstrates the revenue for each variety. The farmers' revenue during the height of the COVID-19 pandemic was six times greater than those after the pandemic's, as illustrated in Figure 2. During the height of the pandemic, the farmers earned IDR 182 millions. It was much more than they have earned during post pandemic which only reached IDR 27 millions. This was followed by differences in sales volume and plant pricing. *Aglaonema* cultivation is so widespread during the pandemic, along with the growth of new hobbyists and time availability to caring the plants (Suwu, 2021). Because of the rose in price, hobbyists were encouraged to care for and sell these plants.

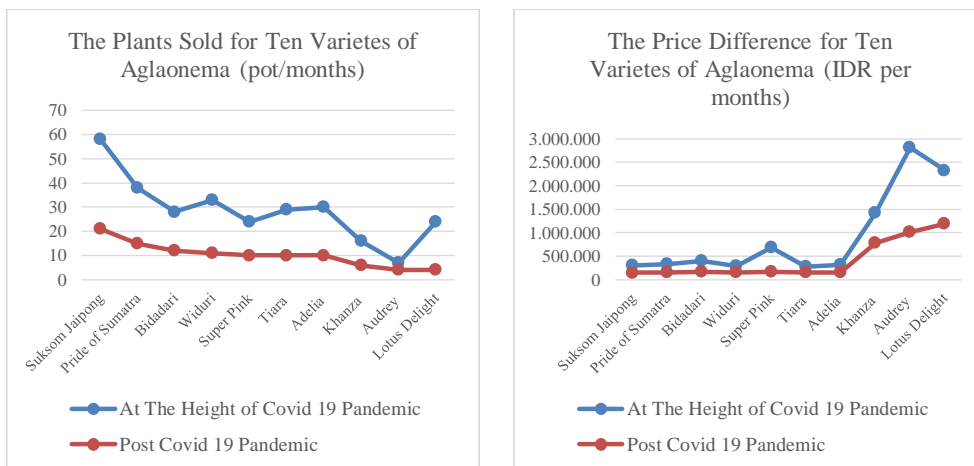


Figure 2. The Output Difference for Seiling during the Height of Covid 19 and Post Covid 19 Pandemic, a) sold product (pot) for each variety, b) price difference for each variety

Figure 2 also displays sales trends for each *aglaonema* variety. Suksom Jaipong was the most popular variety. It had affordable prices and vibrant hues. The sales were fairly constant throughout the year. Small quantities of specialty items such as *Khanza*, *Audrey*, and *Lotus Delight* were marketed. *Lotus Delight* was the most popular of the three sorts at the height of the COVID-19 pandemic. This variety sold 24 pots per month despite being sold at an exceptional price. Their behavior and preferences affect consumers' propensity to purchase. According to the findings of Olewnicki et al. (2019) customers with low incomes prefer to acquire ornamental plants variety at more affordable costs; on the other hand, consumers with high incomes prefer to purchase ornamental plants of the collection or specialty type, despite its fantastic price.

The Covid-19 pandemic has stimulated consumer interest in various ornamental plant varieties, which cause an increase in total sales volume. Gabellini & Scaramuzzi, (2022) explained that the influencing factors could be 1) consumers' willingness to buy luxury products, under the assurance of quality and scarcity values, 2) consumers' awareness of the socio-ecological benefits and emotional therapy of ornamental plants (Bulgari et al., 2021)3

consumers' optimistic assessment of the development of local ornamental plants, and 4) consumers' access to social media and online sales platforms have made it easier to purchase ornamental plants (Anacleto et al., 2021). Due to the lack of outdoor activities, the allocation of household expenditure during the pandemic Covid-19 tended to be low. Under these conditions, the saving of households became substantial. It is evident from Olewnicki et al., (2019) that when household expenditures increase, purchasers prefer to acquire less essential things, including ornamental plants.

Aglaonema has an elastic demand for consumer income, which indicates the quantity of plants demanded was directly proportional to the increase of customer's income (Olewnicki et al., 2019). At the beginning of 2022, outdoor activities, such as work and school resumed back to normal. The necessity for food, clothing, communication, and transportation has reduced household urges to buy other less necessary products, including ornamental plants. It noted that ornamental plants require cultivators' care and attention (Suwu, 2021). The lack of time allocated for caring plants has caused consumers to limit their purchases, either for personal collection or for resale use.

Income Analysis

Farm income is the amount earned from a farming business which shows the difference between revenue and cost. Income is divided into two categories explicit income and implicit income. Explicit incomes refer to income generated after actual payments, while implicit incomes are generated from both actual payments and non-cash expenses. The income for explicit cost was IDR 24 million at the height of the pandemic Covid-19, and IDR 15 million during post pandemic Covid-19, collected from a land area of 197 m². It linear with Suminah that the potential income of *Aglaonema* farming is enormous, ranging from IDR 2 million to IDR 50 million per month, depending on production capacity.

R/C Ratio

The R/C ratio formula is used to justify farm profits. The R/C ratio is the ratio between revenue and production costs. The R/C ratio is divided into two categories: the R/C ratio on explicit cost and the R/C ratio on the total cost. The R/C ratio on explicit costs attempts to identify the relationship between revenue and explicit costs. This one shows the real condition on how growing *aglaonema* in Depok city could generate profits. Because the implicit costs are disregarded from its ratio, the discounted cost is more significant than the R/C ratio of the total costs.

The R/C ratio for explicit cost was higher at the height of COVID-19 pandemic, compared to post COVID-19 pandemic's. This demonstrates that growing *aglaonema* during the height of the COVID-19 pandemic was significantly more profitable than the conditions afterward. Every rupiah of the explicit cost incurred for *aglaonema* cultivation yielded 7,50 rupiah in return. However, the return farmers gained nowadays was only 1,79 rupiah for every rupiah expensed. This number describes the real-time cost-receipt structure of *aglaonema* farmers in Depok City, given that the R/C ratio of explicit cost did not calculate the non-cash expenses. Table 4 demonstrates the income of *aglaonema* farming.

Table 4. *Aglaonema* Farming Income in Depok City

| Component | Height of the COVID-19 pandemic (IDR) | Post COVID-19 pandemic (IDR) |
|----------------------|---------------------------------------|------------------------------|
| Total Cost | 187.060.051 | 27.760.145 |
| Explicit Cost | 24.933.180 | 15.499.713 |
| Implicit Cost | 10.941.421 | 10.474.754 |
| Total cost | 35.874.602601 | 25.974.468467 |
| R/C on explicit cost | 7,50 | 1,79 |
| R/C on total cost | 5,21 | 1,07 |

[R9] Comentário: Value not mentioned in the text.

[R10] Comentário: Necessary to check the values according to table 1

Source: Primary Data, (processed) 2022.

At the height of COVID-19 pandemic, the R/C ratio for total costs was 5,21, and during the post pandemic period, it was 1,07. The R/C percentage in both periods was less than the R/C ratio for explicit cost. The R/C ratio of total costs has been adjusted to consider implicit cost, consequently increasing the cost of expenditures for production factors and decreasing

the ratio of revenues to expenses. This ratio analyzes is used to demonstrate the benefit of *Aglaonema* farming if the farmers or investors are willing to pay for all production factors.

Based on this analysis, it can be inferred that *aglaonema* farming in Depok City is profitable. Even though the profit value has decreased nowadays, farmers are advised waiting for the trends to leverage profits. *Aglaonema* farmers in Depok might increase their product range by expanding their sales through online outlets. Direct visits to flower shops still dominated ornamental plant sales; thus, online sales would be a viable marketing option (Bulgari, 2021; Paiva, 2020). The community of Depok *Aglaonema* Nusantara Association (ASA) is recommended to organize the use of this online technology. Farmers need to strengthen their links with other farmers, producers, and distributors to improve their innovative capabilities (Orozco et al., 2021), hence the community of ASA Depok will be very beneficial to help farmers. Furthermore, government support is also required to provide special business zones so the farming will be able to increase the opportunity to grow (Tiasmalomo et al., 2021).

This study also discovered that *Aglaonema* is ideal to cultivate in the urban area. *Aglaonema* has reasonable commercial worth as well as long-term ecological benefits. This industry attracts many middle- to upper-class customers, most of whom live in cities. Customers are willing to pay extra money since this beautiful plant is classified as a specialty good, which implies that the rarer the variety introduced, the more desired and the higher the selling price is (Gabellini & Scaramuzzi, 2022). Environmental sustainability is also significant because this plant affects physical and mental health benefits, particularly in urban regions plagued by numerous pollution disturbances (Olewnicki et al., 2019). Another advantage of *Aglaonema's* business is its relatively quick stock turnover, which is especially important in expanding stage. Khofifah et al., (2022) research, on the other hand, believes that the movement of changing prices of ornamental plants has a negligible effect on the producer

market, implying that these plants will be available throughout the year despite their variable output. This viewpoint is shared by Olewnicki et al., (2019) and Paiva et al., (2020) who believe that increased interest in ornamental plants will occur in spurts throughout the decline.

CONCLUSION

The fluctuating revenue of *aglaonema* farming is dictated by a trend that indicates an increase in production during the height of the COVID-19 pandemic in 2020; and vice versa at post Covid-19 since 2022. Although there were considerable disparities in both periods, *aglaonema* farming activities in Depok city were profitable. The R/C ratio analysis reveals that *Aglaonema* farming during the height of the COVID-19 pandemic produced significant profits, both in terms of explicit costs and total costs. At the height of the COVID-19 epidemic, the R/C ratio reached 7.50, suggesting that the revenue value was seven times greater than the break-even point. As the COVID-19 pandemic subsided, sales value declined, and farming became less profitable.

[R11] Comentário: Pandemic

The changes in revenue resulted from the increase in price and number of sales for the ten varieties studied. There were only slight changes in some production factors in both periods. The cost structure with the highest expense is the seed, which increases significantly following the trends. This study finds some distinction between the characteristics of *aglaonema* farming and other commodities. First, the characteristics of labor composition, where the employment of family labor was higher than those of external labor. Second, the attributes of using caring facilities, pesticides, and low fertilizers imply that this commodity had a relatively quick turnover, good adaptability, and durability, thereby supporting farmers in reducing costs. This study revealed that growing *Aglaonema* in urban area is worth to be developed, according to its high economic value, extensive stock turnover, and low land use.

Author Contribution

RT: conducting and evaluating the experiment and writing of the manuscript; DR, MM:

developing the idea and correcting the manuscript; RDA: conducting the experiment.

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Technical Article

The Impact of Covid-19 Pandemic on *Aglaonema* Farming Income: A Comparison Between The Height and The Post Trend

Abstract

The expansion of the COVID-19 pandemic from 2019 to 2021 has weakened the performance of critical industries in Indonesia. *Aglaonema* as one of the ornamental plants had a surge in demand as part of the farming industry until they height in 2020. Currently, the response to the demand for ornamental plants has declined considerably. This study discussed (1) the revenue and income of *aglaonema* farming during two periods, at height and the post of the COVID-19 pandemic, and (2) analyzed the distribution of inputs data as information related to the allocation of production. The respondents comprised 32 active farmers from the *aglaonema* community (ASA) in Depok City, who produced 10 varieties of premium *aglaonema*, namely Super Pink, Suksom Jaipong, Khanza, Lotus Delight, Audrey, Tiara, Widuri, Adelia, Bidadari, and Pride of Sumatra. The data was collected from June to November 2022 using the recall method to tabulate data in 2020 (the year of the height of COVID-19 pandemic) and 2022 (the year of the post COVID-19 pandemic). The R/C ratio was used as a profits indicator by considering the implicit and explicit costs. The findings revealed that *aglaonema* farming in Depok City was highly profitable at the height of the COVID-19 pandemic, evidenced by an R/C ratio of 7,50. The R/C ratio has changed in value to 1,79, indicating a decline in farming profitability. Suppose the farmers pay the implicit costs in the current situation, the farming becomes less profitable as shown by the return value which is just slightly above the break-even point.

Keywords: *Aglaonema*; COVID-19; Income; Comparison; Ornamental Plants.

Resumo

Introduction

The propagation of the COVID-19 virus has a global effect on communities, and it impacts not only health but also economic, social, environmental, and political aspects. Affected sectors include commerce, agriculture, fisheries, and other sectoral or non-sectoral investment sectors. Due to the COVID-19 pandemic, the industrial sector, which underpins the Indonesian economy, has also experienced instability, impacting agriculture, forestry, and fisheries to be the mainstay for other sectors. According to Central Statistics Agency (2020) statistics, agriculture, forestry, and fisheries were the third-largest contributors to the Gross Domestic Product (GDP) in 2019. Their combined contribution was 12,27%. Significantly, as

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many as 34,5 million persons of productive age are employed in this area.

Ornamental plants are horticultural subsector plants whose crown shape, leaves, color, scent, and flowers have aesthetic value. An expanding production trend in ornamental plant cultivation characterizes the development of ornamental plant agribusiness (Bulgari et al., 2021). The global demand for ornamental plants tends to increase by 3,9% annually (Gabellini & Scaramuzzi, 2022). Principal consumers of ornamental plants include the United States and Europe, which import them on average from Southeast Asia. *Aglaonema* from Southeast Asia is favored due to its relatively lower price and greater species diversity, including the hybrids (Khofifah et al., 2022). Indonesia, whose 27.500 ornamental plant species represent 10% of the world's total ornamental plant variety, might capitalize on this opportunity as a country with a rich biodiversity. Along with the growth of technology and social media, ornamental plant production has become more lucrative. Decoration, landscaping, parties, and other ceremonial activities have utilized ornamental plants.

Aglaonema, an ornamental pot plant pioneer in Indonesia, has become an essential source of farmer revenue. The aesthetic desires that arose from hobbyists' to become a commercial enterprise. *Aglaonema* production has considerably grown and decreased (Khofifah et al., 2022). Short-term volatility occurred, followed by a fall in output in January and June and an increase in production in September and December. The Price of *aglaonema* tends to rise, particularly between 2015 and 2020. The phenomenon of the highest price of *aglaonema* occurred at the end of 2020, at the height of the COVID-19 pandemic.

Aglaonema production frequently falls short of market requirements. It is relatively difficult to estimate the demand trend for ornamental plants, particularly concerning the desire for hobbyists and decoration service providers (Khofifah et al., 2022). Farmers must also carefully and efficiently handle their products. The term 'efficient' denotes that the utilization of these resources must yield outputs with fewer inputs.

Utilizing production facilities efficiently is typically the primary issue challenge in the *aglaonema* business. A case study in ornamental farming demonstrated a failure that was caused by a limitation of land for cultivation, low labor productivity, high incidence of disease attacks, and an inability to utilize inputs efficiently (Tiasmalomo et al., 2021). Farmers with low management abilities typically send the offer to customer for varieties with excellent resistance, such as *red lipstick*, *donacarmen*, and *big roy*, but provide vary low prices. Farmers only handle high-end varieties (namely *aglaonema* collections) if they have better experience and understanding of nursing management. This type of farmers also benefited the high value of price during the rising of sales for those varieties.

This study examined a group of farmers who have capitalized on the dynamism of the *aglaonema* trend to obtain high profits. The analysis of *aglaonema* farming discussed (1) the source of income data to measure whether the farming operation is profitable or detrimental and (2) learning allocation data of manufacturing inputs in terms of quantity and expenditure. Analysis of *aglaonema* farming was developed by presenting calculations at a single occurrence point, namely the COVID-19 pandemic. The accounting outcomes for these two events were subsequently explicitly analyzed and interpreted. This discussion focused on the performance and dynamic changes in *aglaonema* farming in Depok City when the Covid-19 pandemic heightened in 2020 and diminished in 2022.

MATERIAL AND METHOD

The study was carried out in Depok city as one of the ornamental plants source in major cities in Indonesia. This study's population consists of farmers who are members of a community called *Aglaonema* Nusantara Association (ASA) Depok City, as much as 53 farmers. The research objects to 10 (ten) superior types of *aglaonema* that demonstrated a rising trend at the height of COVID-19 pandemic, including *Super Pink*, *Suksom Jaipong*, *Khanza*, *Lotus Delight*, *Audrey*, *Tiara*, *Widuri*, *Adelia*, *Bidadari*, and *Pride of Sumatra*.

Tabel 1. The Two Popular Types of Aglaonema; Suksom Jaipong and Lotus Delight



Figure 1. a) Suksom Jaipong, b) Super Pink

This paper examined primary and secondary sources of data. Primary data were processed systematically by gathering observations using the recall method and interviews with a list of questions (questionnaires). Secondary data was gathered from various literature from books, scientific works, research reports, and data from Central Statistics Agency (BPS), the Department of Food Crops, Horticulture and Plantation of Depok City, and else. This research utilized descriptive analysis and particularly analyzed the results of field observations, interviews, and secondary data searches.

Data Analysis

This study's data were descriptively and quantitatively analyzed. Age, background, farming experience, occupation, *et cetera.*, are discovered by descriptive analysis. The quantitative analysis of *aglaonema* farming included costs, revenues, and profits.

Revenue is calculated using the following formula:

$$TR = \sum_{i=1}^n Y \cdot Py$$

Where :

TR = Total Revenue (IDR)

Q = Quantity of sales (IDR)

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[PRRXP3] Comentário:

P = Price per variety (IDR/pot)

Farming costs are calculated using the following formula:

$$TC = FC + VC$$

Where :

TC = Total Cost (IDR)

FC = Fixed Costs (including the amount of explicit and implicit fixed costs) (IDR)

VC = Variable costs (including the amount of explicit and implicit variable costs) (IDR)

The Total Cost (TC) is the amount of all production inputs costs, including fertilizers, insecticides, planting media, labor, depreciation, *et cetera*. The requirement is accomplished by multiplying the number of uses by its price, whereas the analysis focuses on certain variables. Certain variables, like labor and depreciations, were analyse first using a specific formula. The labor is measured in man-day units before being multiplied by the prevailing wages in the study area. The calculation of depreciation of equipment and buildings uses the straight-line depreciation model.

[PRRXP4] Comentário: Which formula? Which reference?

The total value of revenue will be divided by the total cost of farming to achieve the revenue-to-cost ratio, abbreviated as R/C. The R/C ratio is utilized as a benchmark for farming profits based on three criteria (Soekartawi, 2016). These three criteria serve as justifications for analysing study data.

- 1) R/C > 1 indicates that farming is profitable
- 2) R/C = 1 indicates the farm is at the break-even point
- 3) R/C < 1 indicates that farming is unprofitable

RESULTS AND DISCUSSION

Overview of Research Locations and Objects

Depok City has a strategic location to cultivate *aglaonema* due to the adjacency to the

market and consumers. Furthermore, this city provides suitable agronomic conditions for *aglaonema* by temperatures of 23 °C – 25 °C, humidity levels of 85% - 90%, wind speeds of 0-20 km per hour, and rainfall of 1.106 mm to 4.579 mm/year. It brings purposeful benefits that have a direct impact on plant growth.

The *Aglaonema* Nusantara Association (ASA) Depok is responsible for *aglaonema* farming in Depok City. ASA comprises *aglaonema* cultivators from numerous backgrounds, including farmers, employees, sellers, and community households. This organization is divided into three levels: Central, Provincial, and City. This organization is spread throughout major cities around Indonesia, including Depok, Jakarta, and Yogyakarta.

ASA was created in response to the changes in the value of *aglaonema* sales during the Covid-19 pandemic. Farmers required an organization as a place for exchanging ideas and affiliating with others due to the sharp rise in demand. Furthermore, this organization is anticipated to reduce fraud, theft, and counterfeiting of *aglaonema*. The ASA aims to develop, promote, and improve the regeneration of farmers. This organization comprises some departments such as marketing, research and development, law, and public relations.

Characteristics of Respondents

The respondents of the study were classified based on age, education levels, farming experience, number of dependents, number of land, and status of land ownership. Following is an explanation of the characteristics of the respondents.

a. Farmer Age

The Central Statistics Agency determines the productive age of the labor, which ranges from 15 to 64 years. This period was crucial in agriculture since it affects physical strength at labor and cognitive abilities, particularly in adopting new technologies. The Minister for National Development Planning (2022) categorizes age into 7 groups that called child, young, early working, the middle age, pre-retirement, retirement, and

elderly – depending on their age. Farmers who grow *aglaonema* are classified in ‘young’ and ‘early working’ age. The labor in the ‘young’ group provides a technological acceptability edge, as seen by their expertise in promoting *Aglaonema* through social media. Younger laborers are not only more creative and innovative than their elder but also gain more power in any sales transactions.

b. Education Level

Education level affects the mental state, attitude, and behavior of farmers. Cultivation knowledge is part of the natural sciences gained during schooling. The greater the level of education, the better their knowledge and critical thinking ability. According to the findings, no farmer had a low level of education. The percentage of farmers with a Senior High School diploma is 68,75%; while the remainder has a higher level of education. This distinguishes the character of farming in *aglaonema* field from other commodities, whose farmer typically come from a low education level.

c. Occupation

Farming is considered to be the main job if it can provide most of a farmer’s daily needs. *Aglaonema* cultivation can be relied upon as the main job for some farmers (60%). The other respondents privately view this farming only as a pastime and a side business. The average size of these farmers' plots of land was 188 m², yet their cultivation experience was relatively fair (an average of 6 years working on *Aglaonema*).

d. Farming Experience

Aglaonema is not the first commodity that farmers cultivate, indeed they have prior expertise in producing a wide range of ornamental plants. The experience in farming also affects the level of success in agriculture, as seen by its output results. Farmers that have long experience in growing *Aglaonema* typically possess a high level of knowledge, experience, and skills for addressing any farming issues. Soeharjo and Patong (1999)

stated that there are three categories of farming experience: less experienced, moderately experienced, and experienced. According to the data, most of farmers got experience, in average number of 9 years. Farmer's experience in growing *Aglaonema* is about 7 years.

e. Number of Dependent Family Members

The word 'dependent family' represents the large number of family members who still live in the same house with the patriarch. There are two categories of family based on their composition, i.e a big family and a small family. Regarding the cost structure of farming, numerous family members can be profitable because they can be employed as the unpaid labor called Family labor (TKDK).

According to data, *aglaonema* farmers in Depok City are classified as big family where most the households have 4 to 5 family members. The total number of dependents in the family, including parents and children, was determined. Typically, the family patriarch solicits assistance from family members to care for the existing *aglaonema* plants. In addition, family members were regarded to be better and more conscientious when it comes to obeying the instructions of the patriarch.

f. Land area

Land area is one of the essential aspects of growing *aglaonema*. The wider the managed land area, the greater the potential for producing results and the opportunity to create more significant revenue. *Aglaonema* was cultivated utilizing pots arranged in a greenhouse. The land area referred to in this study was the production house's size. The land area of *aglaonema* farmers was highly varied, ranging from 10 m² to 1,200 m², with an average of 197,53 m².

The land area category is divided into three groups: small farms (0 – 0,5 hectares), medium farms (0,5 – 2,0 hectares), and large farms (more than 2,0 hectares). Farmers grow *aglaonema* in a small farming area, which is less than 0,5 hectares. However,

growing *Aglaonema* does not require a large size of land like other commodities (such as crops and plantations). Because of its high adaptability in all regions, *Aglaonema* may suitable be a business product in urban areas since its consumers mostly come from middle-high income levels.

g. Land Ownership Status

There are two types of land ownership: private ownership and rental. Land ownership is tied to a farmer's income, affecting costs, revenues, and incomes. Farmers with land rental status have a lower income than farmers with owned status (Pasaribu & Istriningsih, 2020). The existence of payment obligations has increased farming expenses, hence decreasing the potential revenue. The land rental status is commonly given to large-scale commodity farming, like crops or plantations. *Aglaonema* cultivation in Depok City was performed by farmers who owned privately the land.

Cost Analysis

Expense analysis is performed on all components that reduce the value of farm income. Cost divided into the fixed cost and variable cost. The nominal value of fixed costs is the same for each production cycle and is unaffected by production volume, like depreciation and tax expenses. Variable costs are frequently referred to an expense that changes in proportion to how much a farming produces. Seeds, fertilizers, insecticides, and labor are examples of variable costs. The cost analysis of farming is presented in Table 1.

Tabel 1. Cost Structure in Growing *Aglaonema*

| Component | Post Pandemic (IDR) | The Height of Pandemic (IDR) | Percentage during Post Pandemic (%) | Percentage during Height of Pandemic (%) |
|-----------------------------|---------------------|------------------------------|-------------------------------------|--|
| Explicit Fixed Costs | | | | |
| Land tax | 52.458 | 52.458 | 0,20 | 0,15 |
| Seeds | 13.633.333 | 21.000.000 | 52,43 | 58,49 |
| Planting media | 1.028.281 | 1.992.000 | 3,95 | 5,55 |
| External labor | 346.957 | 346.957 | 1,33 | 0,97 |

[PRRXP5] Comentário: All this values is concern acres or Farm?

| | | | | |
|---------------------------------------|------------|------------|--------|--------|
| Pots and ingredients | 244.152 | 1.309.015 | 0,94 | 3,65 |
| Fertilizer | 121.562 | 145.156 | 0,47 | 0,40 |
| Pesticide | 72.968 | 87.593 | 0,28 | 0,24 |
| Total Explicit Cost | 15.499.713 | 24.933.180 | 59,61 | 69,44 |
| Implicit Fixed Cost | | | | |
| Depreciation | 7.702.003 | 7.702.003 | 29,62 | 21,45 |
| Implicit Variable Costs | | | | |
| Seeds (vegetative propagation) | 1.616.666 | 2.083.333 | 6,22 | 5,80 |
| Family labor | 1.156.084 | 1.156.084 | 4,45% | 3,22% |
| Total Implicit Cost | 10.474.754 | 10.941.421 | 40,33% | 30,50% |
| Total Explicit Cost and Implicit Cost | 25.974.468 | 35.874.602 | 100% | 100% |

Source: Primary Data (processed), 2022.

[PRRXP6] Comentário: What means IDR? Most readers know nothing about inflation in Indonesia, for this reason, I suggest that you convert all IDR values to USD.

Variable cost forms based on production capacity, productivity, crop variety, and farmer technology. Both fixed cost and variable cost can be classified more as explicit and implicit costs. Explicit cost refers to the component which is purchased in cash; whereas, implicit cost is any cost that has already occurred without payment but is reported as a separate expense. The components of *aglaonema* farming on Table 1 are described as follows:

1. Land tax

The farmer is exempt from paying land taxes since he owns his land privately. The tax value is a kind of explicit cost and is computed under Tax Object Sales Value (NJOP). The NJOP is determined by comparing the costs of similar objects or new acquisition values. The value deemed by the state to be the property tax base (PBB). Farmers have to pay an annual land tax of 52.458 IDR every month.

[PRRXP7] Comentário: Every month or year. It's sound confused.

2. Seeds

There are two strategies to receive seeds from *aglaonema* farmers in the city of Depok: by vegetative propagation or purchasing them. Seeds obtained through purchase are categorised as an explicit cost since farmers pay directly for them, while vegetative

[PRRXP8] Comentário: categorized

propagation seeds are factored into the implicit cost. During the height of the pandemic, the total cost of seeds purchased was IDR 21 millions. The difference was quite significant between post pandemic and the height of pandemic, to wit IDR ~~IDR~~-7 millions. At the height of the COVID-19 pandemic, there was a shortage of seeds due to high demand from new hobbyists, which drove up the cost of *aglaonema* seeds.

3. Planting Media

Aglaonema has a fair vitality, which refers to the capacity to live or grow in any media. The optimal growing media for *Aglaonema* are often formulated from a blend of such raw materials which contains high porosity. Farmers can purchase pre-mixed planting media or compose the ingredients by their own. Farmers in this study utilize a mixed planting material. The growing medium consists of toasted husks, cocopeat, and fern roots. The planting media is included in the explicit cost since farmers purchase all growing media components monthly. At the height of the epidemic, the total buy value was IDR 1,9 millions; however, after the pandemic, the purchase value of growth media declined since the purchase of seeds also decreased.

4. Labor

The labor employed in *aglaonema* farming consists of Family labor (TKDK) and External labor (TKLK). Family labor refers to the family members who help with any activities in farming but do not have significant wages. External labor is compensated based on the prevalent pay in the research region. Labor duties include preparing seeds, manufacturing planting media, planting or transplanting (repotting), applying fertilizers, vitamins, pesticides, maintaining the greenhouses, packing and delivering plants to customers. The cost of labor is gained by multiplying the absolute number of man-days with a certain amount of wages.

The labor structure for growing *Aglaonema* differs from the labor structure for other

horticultural products. The cost of external labor is generally more expensive than family labor for other farming types; however, the opposite happens for *aglaonema* farming. The characteristic of growing *aglaonema* is comparable to the types of growing flower plants, such as *chrysanthemum* farming (Selfiana, 2020) and other ornamental plants like Orchid Jasmin or Anthurium (Supiani & Sinaini, 2020). Family members are considered more tender in caring activities and flexible in working hours.

The unit of labor is measured by man-day (HOK). HOK is a unit used to calculate labor costs; its value for men is 1 and 0,8 for women. The labor is compensated on a daily and monthly basis. The wages paid to employees range between IDR 50.000 and IDR 150.000, depending on the nature of their employment. Tabel represents the labor utilization for *Aglaonema* cultivation in Depok City.

Table 2. Labor Use Allocation

| Component | The height of COVID-19 Pandemic | | | | Post COVID-19 Pandemic | | | |
|-------------------------------|---------------------------------|----------------|--------------------|--------------------|------------------------|----------------|--------------------|----------------|
| | Man-day | | Wage Expense (IDR) | | Man-day | | Wage Expense (IDR) | |
| | External Workers | Family Workers | External Workers | Non-Family Workers | External Workers | Family Workers | External Workers | Family Workers |
| Preparing Seed | 1,5 | 0,7 | 184.180 | 85.938 | 1,4 | 0,6 | 165.039 | 75.684 |
| Composing planting Media | 1,3 | 0,3 | 183.398 | 47.461 | 1,2 | 0,3 | 166.992 | 42.188 |
| Planting | 1,6 | 0,6 | 189.648 | 71.289 | 1,4 | 0,5 | 166.992 | 59.570 |
| Fertilizing | 0,7 | 0,1 | 66.875 | 14.211 | 0,7 | 0,1 | 66.875 | 14.211 |
| Applying pesticides | 0,5 | 0,1 | 52.246 | 10.867 | 0,5 | 0,1 | 52.246 | 9.195 |
| Taking care of the greenhouse | 1,0 | 0,2 | 46.936 | 10.242 | 1,0 | 0,2 | 45.867 | 10.242 |
| Packaging | 2,9 | 0,8 | 333.496 | 102.051 | 2,4 | 0,7 | 99.305 | 82.520 |
| Delivery | 2,1 | 0,1 | 99.305 | 4.898 | 2,1 | 0,1 | 75.684 | 4.898 |
| Total | 11,7 | 2,9 | 1.156.084 | 346.957 | 10,6 | 2,5 | 839.000 | 298.508 |

Source: Primary Data, (processed) 2022.

Table 2 reveals that packaging activities are the most time-consuming. Farmers must ensure that their product is not harmed in the way to customers; thus, packaging activities are critical. Applying fertilizers or vitamins requires the least amount of time. This

[PRXP9] Comentário: Is not the same? Non-Family workers e external workers?

demonstrates that this plant does not require much nutrition levels. Pesticides are only used for prevention since specific illnesses that target *Aglaonema* are challenging to treat and can only be avoided.

5. Fertilizer/vitamins

It is essential to ensure that plants obtain enough sufficient nutrition to grow optimally. *Dekastar* and *osmocot* are the brands of fertilizers used by farmers. Since both fertilizers are kind of slow-release types, nutrients are gradually delivered into the growth media. This fertilizer is applied once every six months. There is a slight price difference between purchasing fertilizers at the height of the COVID-19 pandemic and post COVID-19 pandemic. At the height of pandemic, the cost of fertilizer procurement is higher than post pandemics, deliberately IDR 145.156 and IDR 121.562. The slight difference between the two periods was caused by the relatively stable price and low intensity of fertilizer usage. Under the conditions of the COVID-19 pandemic, the acceleration of plant sales significantly reduces the expenses of this activity.

6. Pest and disease control

Control of plant disease organisms (OPT) in *Aglaonema* is also essential since the disturbance of organisms' affects the plant's growth. Disturbances that usually occur are not only diseases and pests attacks, but also physiological disorders. The spread of bacterial stem rot caused by the bacteria *Erwinia carotovora* was controlled by spraying a fungicide, called *antracol*. Mealybugs were eliminated using *curacron* at a dose of 0,7 ml per liter of water. The cost of disease control during peak season was still affordable, even more, the high turnover of product stock causes the cost of pesticides to be reduced. At the peak of the COVID-19 pandemic, the cost of applying pesticides was IDR 87.593, a bit higher than in the post-pandemic which was IDR 72.968.

7. Depreciation

[PRRXP10] Comentário: Is this a trade name? You need to use active ingredient.

Depreciation is the diminution in the utility or value of assets and is categorized as a non-cash expense. Depreciation is calculated for production facilities such as watering can, machines, greenhouses, and building; except land. Land investment has no depreciation since its value rises yearly (Pasaribu & Istriningsih, 2020). Depreciation is classified as a fixed cost with a value of IDR 7 millions for both time usage.

8. Pots and packing materials

Pot is a variable expense whose amount varies depending on the amount of output. Direct purchases by customers have caused the consumption of packaging materials to be minimized. Cardboard boxes were only arranged for indirect purchases. Long-distance delivery required additional protection to protect the leaves during shipping. At the height of the pandemic, the price of pots and packaging materials was higher than its need in post COVID-19 pandemic. Farmers spent IDR 1,3 millions for materials at the height of the pandemic and IDR 244.152 during post pandemic period.

Revenue Analysis

Farming revenue is a total sale of the ten *aglaonema* varieties. The amount of sold quantity and prices varied at the period of height and post COVID-19 pandemic. The following table demonstrates the revenue for each variety. The farmers' revenue during the height of the COVID-19 pandemic was six times greater than those after the pandemic's, as illustrated in Figure 2. During the height of the pandemic, the farmers earned IDR 182 millions. It was much more than they have earned during post pandemic which only reached IDR 27 millions. This was followed by differences in sales volume and plant pricing. *Aglaonema* cultivation is so widespread during the pandemic, along with the growth of new hobbyists and time availability to caring the plants (Suwu, 2021). Because of the rose in price, hobbyists were encouraged to care for and sell these plants.

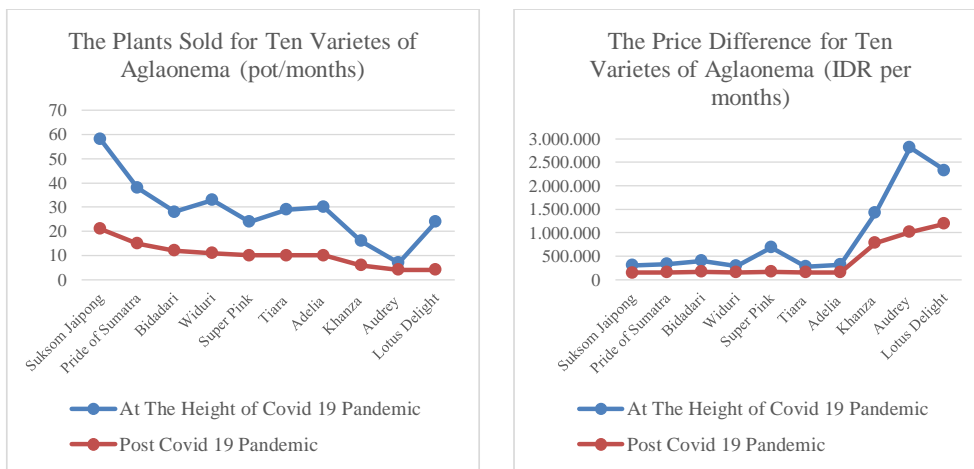


Figure 2. The Output Difference for Selling during the Height of Covid 19 and Post Covid 19 Pandemic, a) sold product (pot) for each variety, b) price difference for each variety

Figure 2 also displays sales trends for each *aglaonema* variety. Suksom Jaipong was the most popular variety. It had affordable prices and vibrant hues. The sales were fairly constant throughout the year. Small quantities of specialty items such as *Khanza*, *Audrey*, and *Lotus Delight* were marketed. *Lotus Delight* was the most popular of the three sorts at the height of the COVID-19 pandemic. This variety sold 24 pots per month despite being sold at an exceptional price. Their behavior and preferences affect consumers' propensity to purchase. According to the findings of Olewnicki et al. (2019) customers with low incomes prefer to acquire ornamental plants variety at more affordable costs; on the other hand, consumers with high incomes prefer to purchase ornamental plants of the collection or specialty type, despite its fantastic price.

The Covid-19 pandemic has stimulated consumer interest in various ornamental plant varieties, which cause an increase in total sales volume. Gabellini & Scaramuzzi, (2022) explained that the influencing factors could be 1) consumers' willingness to buy luxury products, under the assurance of quality and scarcity values, 2) consumers' awareness of the socio-ecological benefits and emotional therapy of ornamental plants (Bulgari et al., 2021).

3) consumers' optimistic assessment of the development of local ornamental plants, and 4) consumers' access to social media and online sales platforms have made it easier to purchase ornamental plants (Anacleto et al., 2021). Due to the lack of outdoor activities, the allocation of household expenditure during the pandemic Covid-19 tended to be low. Under these conditions, the saving of households became substantial. It is evident from Olewnicki et al., (2019) that when household expenditures increase, purchasers prefer to acquire less essential things, including ornamental plants.

Aglaonema has an elastic demand for consumer income, which indicates the quantity of plants demanded was directly proportional to the increase of customer's income (Olewnicki et al., 2019). At the beginning of 2022, outdoor activities, such as work and school resumed back to normal. The necessity for food, clothing, communication, and transportation has reduced household urges to buy other less necessary products, including ornamental plants. It noted that ornamental plants require cultivators' care and attention (Suwu, 2021). The lack of time allocated for caring plants has caused consumers to limit their purchases, either for personal collection or for resale use.

Income Analysis

Farm income is the amount earned from a farming business which shows the difference between revenue and cost. Income is divided into two categories explicit income and implicit income. Explicit incomes refer to income generated after actual payments, while implicit incomes are generated from both actual payments and non-cash expenses. The income for explicit cost was IDR 24 million at the height of the pandemic Covid-19, and IDR 15 million during post pandemic Covid-19, collected from a land area of 197 m². It linear with **Suminah** that the potential income of *Aglaonema* farming is enormous, ranging from IDR 2 million to IDR 50 million per month, depending on production capacity.

[PRRXP11] Comentário: What means Suminah?

R/C Ratio

The R/C ratio formula is used to justify farm profits. The R/C ratio is the ratio between revenue and production costs. The R/C ratio is divided into two categories: the R/C ratio on explicit cost and the R/C ratio on the total cost. The R/C ratio on explicit costs attempts to identify the relationship between revenue and explicit costs. This one shows the real condition on how growing *aglaonema* in Depok city could generate profits. Because the implicit costs are disregarded from its ratio, the discounted cost is more significant than the R/C ratio of the total costs.

The R/C ratio for explicit cost was higher at the height of COVID-19 pandemic, compared to post COVID-19 pandemic's. This demonstrates that growing *aglaonema* during the height of the COVID-19 pandemic was significantly more profitable than the conditions afterward. Every rupiah of the explicit cost incurred for *aglaonema* cultivation yielded -7,50 rupiah in return. However, the return farmers gained nowadays was only 1,79 rupiah for every rupiah expensed. This number describes the real-time cost-receipt structure of *aglaonema* farmers in Depok City, given that the R/C ratio of explicit cost did not calculate the non-cash expenses. Table 4 demonstrates the income of *aglaonema* farming.

Table 4. *Aglaonema* Farming Income in Depok City

| Component | Height of the COVID-19 pandemic (IDR) | Post COVID-19 pandemic (IDR) |
|----------------------|---------------------------------------|------------------------------|
| Total Cost | 187.060.051 | 27.760.145 |
| Explicit Cost | 24.933.180 | 15.499.713 |
| Implicit Cost | 10.941.421 | 10.474.754 |
| Total cost | 35.874.602 | 25.974.468 |
| R/C on explicit cost | 7,50 | 1,79 |
| R/C on total cost | 5,21 | 1,07 |

Source: Primary Data, (processed) 2022.

At the height of COVID-19 pandemic, the R/C ratio for total costs was 5,21, and during the post pandemic period, it was 1,07. The R/C percentage in both periods was less than the R/C ratio for explicit cost. The R/C ratio of total costs has been adjusted to consider implicit cost, consequently increasing the cost of expenditures for production factors and decreasing

the ratio of revenues to expenses. This ratio analyzes is used to demonstrate the benefit of *Aglaonema* farming if the farmers or investors are willing to pay for all production factors.

Based on this analysis, it can be inferred that *aglaonema* farming in Depok City is profitable. Even though the profit value has decreased nowadays, farmers are advised waiting for the trends to leverage profits. *Aglaonema* farmers in Depok might increase their product range by expanding their sales through online outlets. Direct visits to flower shops still dominated ornamental plant sales; thus, online sales would be a viable marketing option (Bulgari, 2021; Paiva, 2020). The community of Depok *Aglaonema* Nusantara Association (ASA) is recommended to organize the use of this online technology. Farmers need to strengthen their links with other farmers, producers, and distributors to improve their innovative capabilities (Orozco et al., 2021), hence the community of ASA Depok will be very beneficial to help farmers. Furthermore, government support is also required to provide special business zones so the farming will be able to increases the opportunity to grow (Tiasmalomo et al., 2021).

This study also discovered that *Aglaonema* is ideal to cultivate in the urban area. *Aglaonema* has reasonable commercial worth as well as long-term ecological benefits. This industry attracts many middle- to upper-class customers, most of whom live in cities. Customers are willing to pay extra money since this beautiful plant is classified as a specialty good, which implies that the rarer the variety introduced, the more desired and the higher the selling price is (Gabellini & Scaramuzzi, 2022). Environmental sustainability is also significant because this plant affects physical and mental health benefits, particularly in urban regions plagued by numerous pollution disturbances (Olewnicki et al., 2019). Another advantage of *Aglaonema's* business is its relatively quick stock turnover, which is especially important in expanding stage. Khofifah et al., (2022) research, on the other hand, believes that the [movement of](#) changing prices of ornamental plants has a negligible effect on the producer

market, implying that these plants will be available throughout the year despite their variable output. This viewpoint is shared by Olewnicki et al., (2019) and Paiva et al., (2020) who believe that increased interest in ornamental plants will occur in spurts throughout the decline.

CONCLUSION

The fluctuating revenue of *aglaonema* farming is dictated by a trend that indicates an increase in production during the height of the COVID-19 pandemic in 2020; and vice versa at post Covid-19 since 2022. Although there were considerable disparities in both periods, *aglaonema* farming activities in Depok city were profitable. The R/C ratio analysis reveals that *Aglaonema* farming during the height of the COVID-19 pandemic produced significant profits, both in terms of explicit costs and total costs. At the height of the COVID-19 epidemic, the R/C ratio reached 7.50, suggesting that the revenue value was seven times greater than the break-even point. As the COVID-19 pandemic subsided, sales value declined, and farming became less profitable.

The changes in revenue resulted from the increase in price and number of sales for the ten varieties studied. There were only slight changes in some production factors in both periods. The cost structure with the highest expense is the seed, which increases significantly following the trends. This study finds some distinction between the characteristics of *aglaonema* farming and other commodities. First, the characteristics of labor composition, where the employment of family labor was higher than those of external labor. Second, the attributes of using caring facilities, pesticides, and low fertilizers imply that this commodity had a relatively quick turnover, good adaptability, and durability, thereby supporting farmers in reducing costs. This study revealed that growing *Aglaonema* in urban area is worth to be developed, according to its high economic value, extensive stock turnover, and low land use.

Author Contribution

RT: conducting and evaluating the experiment and writing of the manuscript; DR, MM:

developing the idea and correcting the manuscript; RDA: conducting the experiment.

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