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Urban Organic Farming: Farming Business Analysis of Vigur O Women's Farmer Group, Malang City

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ABSTRACT

In general, urban land is not intended for agriculture, but some people live in suburban settlements, taking the initiative to become farmers due to the community's need for healthy food from organic farming, such as vegetables. The problem of organic vegetables is not available in Traditional Markets but Modern Markets with quite expensive prices. Therefore, it is possible to become an organic vegetable farmer in urban areas, assuming transport cost efficiency, because it is close to the market. Therefore, the Vigur O Women Farmers Group (KWT) is a community that participates in the 2010 Go Organic government program and has received a certificate (SNI) Organic from LeSOS, so this study has a purpose, to analyze organic vegetable farming with the object of research is KWT Vigur O in Malang - Indonesia. The vegetables grown are Watercress, mustard greens and Pak Choy. Based on the results of the analysis of farming, the highest profit in one harvest for 100m^2 of land is Watercress. The majority of farming is a side business that is useful to increase family income. However, there are marketing constraints for KWT Vigur O, so creating a web and building an online network is advisable.

Keywords: Urban, Vigur O Women Farmer Group, Organic Vegetables, Farming Business.

INTRODUCTION

There has been widely discussed in various media about the influence of food on health. A healthy environment, economy and social environment are necessary to produce healthy foods. A healthy environment here implies safety following four (4) principles of organic farming, including health, ecology, justice, and protection (IFOAM, 2005 in Padel et al., 2009 and Saragih, 2010). Many organic community associations show the benefits of organic for the environment and the community's economy. The rapid expansion of organic farming can significantly reduce poverty (Sarker and Itohara, 2008). In addition, farming with entrepreneurial content is to organize the factors of production: nature, labour, capital and skills for production purposes (Alma, 2009). However, realizing organic farming in urban areas is difficult, given the narrow land area. However, because it is close to the market, this business provides profit opportunities, so it can reduce transportation costs. Thus, the stimulus to do the farming, namely through counselling. This is based on the results of Prayoga's research (2010), that the intensity of attending counseling has a significant effect on increasing the level of application of organic farming. Currently, there are already several organic restaurants in big cities, but there is no need to question whether the restaurant is based on profit or principle (Poulston and Kwong Yiu, 2011). Basically, big cities are promising markets for organic agricultural products. In general, organic vegetables are much more expensive, but educated people with high incomes show greater interest in buying than those with low education (Junaedi, 2006).

According to the research results by David & Ardiansyah (2017) that 69% of young consumers buy organic products at supermarkets. Then, most (23%) buy vegetables compared to other organic products. The reason consumers (78.8%) buy organic vegetables is because they are free of pesticides. Although consumers are unfamiliar with Indonesian organic labels, 52% are willing to buy organic food soon. This finding can benefit organic sellers and retailers because they can help develop further marketing strategies to get potential consumers. This means that growing organic vegetables is an opportunity for organic vegetable farmers. In addition, to reconsider the Organic Agriculture Policy that applies in Indonesia after and during the implementation of the "Go Organic 2010" and "Thousand Village Organic Agriculture" programs based on the Decree of the Minister of Agriculture no. 58 of 2015, to form the Working Group for the Development of a Thousand Organic Agriculture Villages (Gutomo el al.2019). Therefore, it is important to support the decision of the Minister of Agriculture, so this study aims to analyze the organic vegetable farming business carried out by the Vigur O Women Farmers Group (KWT) in Malang City - Indonesia.

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LITERATURE REVIEW

Agricultural land is generally located in rural areas, but KWT Vigur O is located in the Vila Gunung Buring Housing Estate, Cemorokandang, Malang City. The description of the organic vegetable garden model in the housing is shown in Figure 1 as follows.

Figure 1. Vigur O Organic Vegetable Garden

Based on location theory in urban economics, the closer the distance to the market, the more efficient the transport costs. An illustration is made of the relationship between the distance between the location of the vegetable garden and the shipping costs shown in Figure 2.

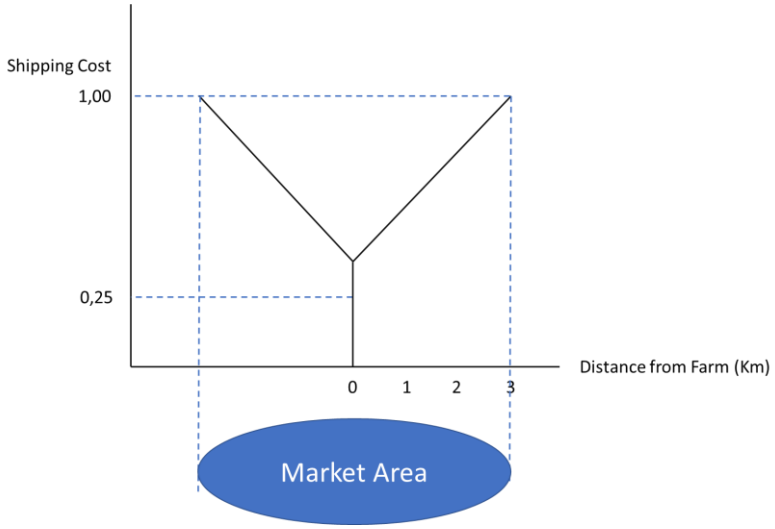

Figure 2. The Illustration of Distance and Cost (Adopted from O'Sullivan, 2012)

RESEARCH METHOD

Population and Sample.

This study's target population or subject is the "Vigur O" community in the Gunung Buring Villa Housing, Malang City. Then the sample is taken based on the census, namely the entire population with the "Vigur O" community category. The population in this study is the number of individuals in the "Vigur O" community residing in the Gunung Buring Villa Housing. According to research informants, the head of the "Vigur O" community, the number of family heads is 70 families, while the members of the "Vigur O" community are 18 people and one marketer.

Analysis Unit

The unit of analysis in research is a certain unit calculated as a research subject (Arikunto, 2002). In this study, we want to know whether vegetable farming can increase family income.

a. Research Instrument

A research instrument is a tool used in data collection. This study uses an open and structured interview method using a questionnaire as a quantitative method level on members of the "Vigur O" community. Then explore data that cannot be studied quantitatively, namely through in-depth interviews with competent informants to provide information.

b. Data and Information Collection

The collection of data and information in this study is about the steps taken in the survey technique used in data collection.

c. Data Analysis

The analytical method used in this study is shown in Table 1 below

Tabel 1. Data Analysis Method

Research Goals	Data	Source	Analytical Method
Calculating production costs, revenues, and profits on mustard, Watercress, and Pak Choy vegetable farming in KWT Vigur O	a. Variable costs (the price of seeds, labour wages, price of compost fertilizer, price of liquid fertilizer, transportation costs) b. Fixed costs (tax costs and equipment depreciation costs) c. Total production of mustard, Watercress, and Pak Choy in one growing season and the selling price of mustard, Watercress and Pak Choy.	Primary	Quantitative Analysis

Quantitative analysis is used for calculations in the form of numbers obtained from primary data, namely production costs and revenues. Production costs and revenues are then used to calculate the profit for organic vegetable commodities (mustard, Watercress and Pak Choy).

1. Production Cost

Total costs are costs incurred for farming mustard greens, Watercress and Pak Choy in one growing season, consisting of fixed and variable costs. The following describes fixed costs, variable costs, total costs, revenues and profits.

a. Fixed Cost

Fixed costs are costs that are not affected by production. The fixed costs of farming mustard greens, Watercress and Pak Choy are land tax and equipment depreciation costs. The cost of land tax used is the one-month cost because it adjusts to one season for planting mustard greens, Watercress and Pak Choy, while to calculate the depreciation cost of the equipment, data on the number of tools are needed, the purchase price of the equipment, the selling price of the equipment, and the economic life of the equipment.

b. Variable Cost

Variable costs are costing whose amount is influenced by the results of production. Variable costs for mustard, Watercress and Pak Choy farming consist of seed costs, labour costs, compost fertilizer costs, liquid fertilizer costs and transportation costs.

c. Total Cost

The total cost is obtained by adding up the variable and fixed costs. Total cost is used to calculate farm revenue.

2. Revenue

The revenue from mustard, Watercress and Pak Choy farming is obtained from the amount of production multiplied by the price of vegetables. The formula used to calculate revenue is as follows:

Calculating mustard green (s), Watercress (k), and Pak Choy (p).
TR_{sawi} = Ps,k,p X Q s,k,p
Ps,k,p_i = mustard green price (Rp)
Qs,k,p = production s,k,p (kg)

3. Profit

To get a profit in the Vigur O farmer group, it is calculated according to Soekartawi (1992) using this formula:
Π = TR – TC
=(P X Q) – (TFC + TVC)
Keterangan:
Π: Profit from the farming product (mustard, Watercress and Pak Choy) (Rp)
TR: Total revenue (Rp)
TC: total cost (Rp)
P : Price from farming products (Rp)
Q : Amount of farming products (kg)
TFC: Total Fixed Cost (Rp)
TVC: Total Variable Cost (Rp)

RESULTS & DISCUSSION

Organic Vegetable Farming Activity

Organic vegetable farming activities in the Vigur O Women Farmer Group start from cultivation, post-harvest and marketing activities. Cultivation activities are carried out by group members starting from the preparation of planting media, planting, and harvesting to post-harvest, but in the process of finishing the product ready to be marketed, it is carried out and supervised directly by the core management. According to the natural conditions of Cemorokandang, organic vegetable cultivation is located at an average altitude of 449 meters above sea level, an average daily temperature of 240C and an air humidity level of 7.2%. This follows the conditions for growing Watercress, mustard greens and Pak Choy, which grow well at an altitude of 100-500 meters above sea level. Organic vegetable cultivation activities in the Vigur O Women Farmers Group are divided into two parts: the types of vegetables that require seeding and the types of vegetables grown without sowing. Types of vegetables that require seeding include Watercress, spinach, scallions, dumplings, kailan, tomatoes, and many others. Organic vegetable cultivation is explained as follows: land preparation, planting, care, harvest and post-harvest.

a. Land Preparation

Organic vegetable cultivation activities can be carried out in the yard, moor, or rice fields. Likewise, in the Vigur O Women's Farmer Group, some take advantage of the empty yard next to the house, which is planned to be in the form of a bed so that it is cost-effective and saves space. If the land has been made beds, it is loosened by hoeing and given manure with a ratio of soil and manure of 1:1. Manure is given once before planting or as basic fertilizer because organic cultivation is carried out without using chemical fertilizers, pesticides, fungicides and herbicides. The next stage, specifically for types of plants that require seeding, is to prepare to plant holes to plant seeds that have been sown. The aim is to move vegetable seeds so that plant roots can grow straight, while plant types that are directly spread do not need to make planting holes. The nursery media is made in the form of beds, and the media for planting mustard and Pak Choy is different from Watercress. The planting media for mustard and Pak Choy are given planting holes with a distance of approximately 12 cm. The aim is to give the spacing so that the leaves that grow do not overlap and that the plants get enough sunlight.

b. Planting

Planting organic vegetables is divided into two: the need for sowing and the direct planting of seeds without sowing. This type of Watercress is planted by spreading the Watercress seeds on a bed and then covering it thinly with soil, in one bed it takes ± 10 grams of Watercress seeds. If Watercress is planted in polybags with a diameter of 20 cm, one seed is planted with a hole, while the number of holes is about 25 holes per polybag. Unlike the mustard and Pak Choy, which require a nursery before being transferred to the planting hole. Previously, mustard or Pak Choy seeds were spread like water spinach seeds. After more than a week of they were transferred to the planting hole. The last step of planting is watering carefully and not to damage the topsoil or planting hole.

c. Care

Organic vegetable care includes watering the plants every afternoon and not watering again if the plants have been exposed to rain. The water used for watering is added with liquid fertilizer. This is only done a few times when the plants feel less healthy and are attacked by pests and diseases. Other activities include pulling weeds and checking plants for pests and diseases carried out daily. If pests attack the plants, the action taken is to get rid of them, and the pests are killed by destroying them because the control does not use chemical pesticides. The care of mustard greens, Watercress and Pak Choy varies with commodity type. Water spinach plants are more susceptible to pests and diseases. Caterpillars, Grashopper, and Whips. It is not uncommon to find wilt disease so that the Watercress leaves dry up and rot over time. Mustard plants require almost the same care as Watercress. Pests often encountered in mustard plants are grasshoppers and caterpillars, causing the mustard leaves to become damaged. The damaged leaves cannot be sold to supermarkets or will be consumed by group members themselves. Treatment of Pak Choy plants is more manageable than mustard and Watercress plants because Pak Choy commodities are more resistant to pests and diseases. Pak Choy plants require more watering because the type of Pak Choy tree trunk has high water content. The three commodities of mustard greens, Watercress and Pak Choy experienced better growth in the greenhouse because they could suppress the emergence of pests and diseases with suitable temperature conditions.

d. Harvest and Post-Harvest

Harvesting is taking the results of cultivation that is carried out when the plant is old enough to be harvested and consumed. The age of ready-to-harvest vegetables varies depending on the type of commodity. The criteria for harvesting organic vegetables are based on physical characteristics such as plant height and plant crunch when cooked. Kangkung can be harvested after 18 DAP (days after planting), while mustard and Pak Choy can be harvested at 24 DAP. Plant growth depends on the weather and the place of planting. Generally, vegetables grown in the greenhouse have good growth. Post-harvest activities are cleaning vegetables from dirt in the form of soil, cleaning vegetables using running water and the water used is draw-well water or tap water which is free from chemical contamination. Furthermore, the vegetables are packed into plastic packaging branded by Vi-O brand.

Cost Analysis of Organic Vegetable Farming

Farming costs are all costs used for organic vegetable farming activities in KWT Vigur O. Farming activities require costs, including cultivation and marketing activities. Farming costs, generally called total costs, consist of fixed and variable costs. After the total cost is obtained, the revenues and profits of each commodity of mustard, Watercress and Pak Choy will also be calculated. Analysis of organic vegetable farming using a land area of 300 m2 consisting of mustard, Watercress and Pak Choy plants. The land area of 100 m2 per commodity shows production costs. The goal is to know the costs incurred every 100 m2 for each vegetable commodity. The components of the calculation of farming costs are explained coherently, starting from fixed costs, variable costs, and total costs, then proceed to calculate farm revenues and profits.

a. Total Fixed Cost

Fixed costs are costs incurred by KWT Vigur O to produce products in the form of mustard, Watercress and Pak Choy and are not affected by the production level. The fixed cost expenditure occurs gradually, and the amount is almost constant for each production time. Fixed costs are usually incurred at the beginning of cultivation, the production of which is large or small. Fixed costs will also not increase or decrease. In other words, the production size does not influence fixed costs. The farming listed is cash farming carried out on an area of 100 m2 with details of fixed costs consisting of depreciation and taxes. Depreciation cost per year is calculated utilizing the purchase price minus the current selling price divided by the economic life of the product multiplied by the number of goods. As for the annual depreciation cost divided by twelve, the result is the depreciation cost per production. Another fixed cost is taxed because the status of cultivated land is one's own. The average fixed costs of farming mustard, Watercress and Pak Choy commodities in one growing season are shown in Table 2.

Table 2. The Average Fixed Cost for Farming Product

No	Description	Amount (Rp)		
		Mustard	Watercress	Pak Choy
1	Tools Depreciation Cost	30.667	36.075	42.973
2	Tax	3.336	3.516	2.148
	Total Cost	34.003	39.591	45.121

Source: Primary Data, Processed

Based on Table 2. it is explained that the fixed costs incurred during one planting season for mustard commodities are Rp. 34,003.00, for Watercress Rp. 39,591.00, and Pak Choy Rp. 45,121.00. The highest fixed costs are spent on

Pak Choy cultivation because, in real conditions, Pak Choy cultivation is carried out in a greenhouse, so equipment depreciation costs are also high for a greenhouse.

b. Total Variable Cost

The costs incurred by farmer groups and the amount influenced by the production level of organic vegetables are called variable costs. Variable costs include seeds, compost, liquid fertilizer, labour and transportation costs. Mustard and Pak Choy seeds are purchased per 10 grams at Rp. 20,000.00, while farmers purchase each kilogram of Watercress at Rp. 37,000.00. Watercress incurs the highest cost of seeds because compared to mustard and Pak Choy, which have a light size and weight, they need more seeds to plant and Watercress growers who do not use spacing require many seeds. The three vegetables used the same compost fertilizer and were purchased from a group member at Rp.20,000.00/20 kg, while liquid fertilizer was used as an additional fertilizer which was used together with water.

Liquid fertilizer comes from the cow's rumen, so it is free from chemicals. Cultivation is carried out by labour in the family because the land is relatively narrow, and it is sufficient for the family to do it themselves. Although the workforce used is family labour, it is calculated as a variable cost with units of workdays, namely the outpouring of work used for vegetable cultivation; one day is five hours of working time starting at 07.00 – 11.00 WIB with a wage of Rp. 20,000.00 per day for women and men. The results of vegetable production are delivered to consumers using motorbikes because it is easier to bring vegetables from the secretariat building for packaging vegetables to be sold. This transportation cost is the same as the price of one litre of gasoline, which usually carries 20 kg of vegetables once. Transport costs are not too high, but still a variable cost. The average variable costs of farming the commodities of mustard, Watercress and Pak Choy in one growing season are shown in Table 3.

Table 3. Average Variable Cost for Farming Mustard, Watercress, and Pakhcoy

No	Description	Amount (Rp)		
		Mustard	**Watercress**	**Pak Choy**
1	Seedling	12.950	7.261	12.849
2	Compost Fertilizer	81.497	95.456	68.086
3	Liquid Fertilizer	32.338	29.915	32.645
4	Labour	1.043.165	938.566	1.256.983
5	Transportation Cost	6.900	6.900	6.900
	Total Variable Cost	1.176.850	1.078.098	1.377.463

Source: Primary Data, Processed

Based on Table 3. it is explained that the variable costs for one season of planting mustard greens are Rp. 1,176,850.0; kangkung commodities are Rp. 1,078,098.00 and Pak Choy commodities are Rp. 1,377,463.00. The highest variable costs are for cultivating Pak Choy because in real conditions, Pak Choy requires care such as seeding and transplanting seeds so that it requires more labor, while the lowest variable costs are Watercress because the cost of cheap Watercress seeds influences it, and Watercress care is not too complicated so that it saves labor cost that affects the wages of workers.

c. Total Cost

The total cost is the sum of all costs used in farming organic mustard greens, Watercress and Pak Choy, which consists of the total fixed costs and variable costs. The average total cost of farming the mustard, Watercress and Pak Choy commodities in one growing season is shown in Table 4.

Table 4. Total Cost for Farming Products

No	Description	Amount (Rp)		
		Mustard	Watercress	Pak Choy
1	Total Fixed Cost	34.003	39.591	45.121
2	Total Variable Cost	1.176.000	1.078.098	1.377.463
	Total Revenue (Rp)	1.210.833	1.117.689	1.422.584

Source: Primary Data, Processed

Based on Table 4. it is explained that the income from farming for one season of mustard planting is Rp. 1,210,853.00; Watercress Rp 1,117,689.00; and Pak Choy Rp 1,422,584.00. The highest revenue is Watercress with the total profit calculated for mustard, Watercress and Pak Choy commodities.

d. Revenue

Farming revenue is obtained from the amount of production multiplied by the selling price per kilogram of vegetables, which is Rp. 15,000.00. The amount of revenue is influenced by the production and selling price of organic vegetables, shown in Table 5.

Table 5. Average Revenue for Farming Products

No	Description	Amount (Rp)		
		Mustard	Watercress	Pak Choy
1	Production (kg)	118	117	103
2	Price per kg (Rp)	15.000	15.000	15.000
	Total Revenue (Rp)	1.770.000	1.755.000	1.545.000

Source: Primary Data, Processed

Based on table 5. it is explained that farm income for one season of mustard planting is Rp1,770,000.00; Watercress Rp1.755,000.00; and Pak Choy Rp. 1,545,000.00. The highest revenue is Watercress with the total profit calculated for mustard, Watercress and Pak Choy commodities.

e. Profit

Profits for one growing season are calculated from revenues minus total costs. The advantages of each farm will be explained in Table 6 below:

Table 6. Average Revenue for Farming Products

No	Description	Amount (Rp)		
		Mustard	Watercress	Pak Choy
1	Total Revenue (Rp)	1.770.000	1.755.000	1.545.000
2	Total Cost (Rp)	1.210.853	1.117.689	1.422.584
	Profits	599.147	673.311	122.416

Source: Primary Data, Processed

Based on Table 6. it is explained that the income from organic vegetable farming on an average area of 100 m2 for one growing season for each commodity produces a profit, namely the mustard commodity of Rp. 559,147.00; Watercress Rp 673,311.00; and Pak Choy Rp 122,416.00. Of the three commodities

cultivated by the Vigur Organic farmer group, the benefits of Watercress were Rp. 673,311.00 per planting season with the highest profit compared to mustard and Pak Choy.

2. **Organic Certification**
   Based on an interview with the Head of KWT Vigur O, vegetable cultivation has obtained organic certification by LeSOS and has applied for recertification because LeSos certification is valid for three years. The certification cost is jointly borne by KWT Vigur O members and can be paid in instalments every time they deposit the vegetable harvest. With this certification, the selling price increases. In addition, according to information from the respondents, the activity of growing vegetables around the residence is a side job that can increase family income.

CONCLUSION

KWT Vigur O organic vegetable farming activities start from cultivation, post-harvest and marketing activities. Each vegetable cultivated with the treatment has different land preparation, planting, care, and harvesting for each vegetable. The highest total income from farming is mustard greens, the second is Watercress and the third is Pak Choy. However, the highest total cost is mustard greens, second is Pak Choy and third is Watercress. It turns out that the highest profit is Watercress, the second and third are mustards and Pak Choy. Given that there are still marketing constraints, it is advisable to create a web and online marketing.

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DECLARATION OF CONFLICTING INTERESTS
All authors declare that they have no conflicts of interest.

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