



## SURAT TUGAS

Nomor : 26/061051.LPPM/LT/ VII/2023

Yang bertanda tangan dibawah ini :

Nama : Suwali, S.P., M.Si.

Jabatan : Ketua Lembaga Penelitian dan Pengabdian Kepada Masyarakat  
Universitas Perwira Purbalingga

Dengan ini memberikan tugas kepada:

No	Nama	NIDN	Prodi	Status
1	Ayu Sitanini, S.E., M.P.	0603018702	Agribisnis Universitas Perwira Purbalingga	Dosen Tetap
2	Victor Bintang Panunggul, S.P., M.P.	0621039202	Agribisnis Universitas Perwira Purbalingga	Dosen Tetap
3	Dwi Kurniawati	02003029	Agribisnis Universitas Perwira Purbalingga	Mahasiswa
4	Raflina Nurwanda Ningsih	02003036	Agribisnis Universitas Perwira Purbalingga	Mahasiswa

Untuk melaksanakan tugas Pengabdian Kepada Masyarakat dengan:

Judul : Efisiensi Penggunaan Faktor Produksi pada Usahatani Kentang yang Berwawasan Lingkungan di Kecamatan Karangreja, Kabupaten Purbalingga

Tempat Penelitian : Desa Serang Kecamatan Karangreja Kabupaten Purbalingga

Waktu : >1 Semester (Penelitian Lanjutan)

Demikian surat tugas ini diberikan untuk dilaksanakan dengan sebaik – baiknya.

Purbalingga, 6 Juli 2023  
Ketua LPPM  
Universitas Perwira Purbalingga

  
**Suwali, S.P., M.Si.**



[Home](#) [About](#) [Current](#) [Archives](#) [Announcements](#)

 Search

## About the Journal

**Hexagro (P-ISSN: 2549-2691, E-ISSN: 2686-3316)** is a scientific journal of Agribusiness that is published twice per year in February and August by LPPM University of Perjuangan Tasikmalaya. Hexagro obtained p-ISSN **2549-2691** in February 2017 furthermore, hexagro obtained e-ISSN series no **2686-3316** in 2019 and become an open access journal and indexed Sinta 5. thanks for hardworking and dedication to the journal team. The Hexagro Journal publishes in bilingual English and Bahasa Indonesia.

The focus of this journal is on Agriculture in all aspects in 2017 and 2018. Since 2019 Hexagro has accommodated the original scientific articles with a focus on agribusiness and agricultural socioeconomic. The scopes included agricultural development, extension, policy, supply-value chain, financial, trading-marketing, entrepreneurship, urban farming, climate change, and environmental issues.

Hexagro is essentially a sharing platform for authors, where junior writers with brilliant ideas, concepts, and research results could gain experience from senior writers and benefit from those experienced writers as mentors to guide and motivate, so they could write better. Hexagro is expected to become a place for the dissemination of ideas, and



E-ISSN



P-ISSN

> [Focus and Scope](#)

> [Publication Ethics](#)

> [Author Guidelines](#)

> [Author Declaration](#)

> [Author Fees](#)

> [Editorial Team](#)

permanent scientific records and to build a reputation for these writers before stepping into a more competent to be reputable international journal. Hexagro is open to collaborating with journals and relevant institutions.

Hexagro Journal has been indexed by Sinta 5, Google Scholar, Dimension, Scilit, Garuda, Neliti, Base, Onesearch, and Crossref since 2019, and all article has DOI number with the prefix 10.36423/hexagro. Hexagro has made a partnership with PERHEPI. Reviewers will review all articles submitted to this journal with a double-blind review system.

To improve the quality of manuscripts and to reach broader international audiences Hexagro starts publishing bilingual articles in English and Bahasa Indonesia in February 2021, and will be full in English, starting from Vol. 7 No. 2 2023 edition. The review process will still be done in Bahasa Indonesia and quality articles will be subsequently translated into English by Hexagro translators. Hexagro only accepts manuscripts that have never been published and are not in the process of publication elsewhere. The writing procedure follows the requirements in accordance with those described in the **author's guidelines**. The writing has to follow the **article template of Hexagro (download)** The reference and citation strongly suggest using the Mendeley application (mendeley.com).

If any troubles in Open Journal System (OJS), Hexagro still accepts manuscripts via email (hexagro@unper.ac.id) in order for the process to go well.

## Current Issue

📅 Vol. 8 No. 1 (2024): Jurnal Hexagro

📅 **Published:** 2024-02-10



## Articles

### CORRELATION ANALYSIS OF HOUSEHOLD DEMAND FACTORS WITH THE DEMAND FOR CHICKEN MEAT IN THE RAWA INDAH MARKET, BONTANG MUNICIPALITY

 Anisa Ambarwati, Edy Prasetyo, Wahyu Dyah Prastiwi

 1-14

 PDF


### STRATEGY DIGITAL MARKETING AND SUCCESS IN FARMING PLANT CACTUS AND PEPEROMIA AT PT. GRAHA MITRATAMA INNOVASI

 Tirta Yoga, Eri Yusnita Arvianti, Dyanasari Dyanasari

 15-24

 PDF 15-24

### EFFICIENCY OF PRODUCTION FACTORS USAGE IN ENVIRONMENTALLY CONSCIOUS POTATO FARMING IN KARANGREJA DISTRICT, PURBALINGGA REGENCY

 Ayu Sitanini, Victor Bintang Panunggul, Dwi Kurniawati, Raflina Nurwanda Ningsih

 25-36

 PDF 25-36



Indexed by



### COCOA MARKETING ANALYSIS (*Theobroma cacao* L.) IN KALIGARANG, KELING DISTRICT, JEPARA REGENCY

👤 Rossi Prabowo, Dewi Hastuti, Siti Umi Nur Magfiroh

📄 37-49

📄 PDF 37-49

### KNOWLEDGE LEVEL OF NU MA'RUF KUDUS HIGH SCHOOL STUDENTS REGARDING COMPOST FERTILIZER TO SUPPORT SUSTAINABLE AGRICULTURAL EFFORTS

👤 M. Aris Pujiyanto, Dwi Putriana Nuramanah Kinding, Muhamad Solekan, Sarno Sarno

📄 50-65

📄 PDF 50-65

### LEADING COMMODITIES AND COMPETITIVENESS AGRICULTURAL SECTOR OF WEST PASAMAN DISTRICT

👤 Syahrial, Angelia Leovita, Haslinda Simangunsong

📄 66-79

📄 PDF 66-79

### RESPIRATION PATHWAYS AND ECONOMIC ASPECT OF BARLEY (*Hordeum vulgare*). A REVIEW

👤 Farhan Ahmad

📄 80-93

📄 PDF 80-93



Journal Tools



[View All Issues >](#)



Language

Bahasa Indonesia

English

### About Us

View My Stat

21780



### Quick Links

[About the journal](#)

[Submissions](#)

[Editorial Team](#)

[Privacy Statement](#)

### Contact Us

📍 Jalan PETA No. 177 Kota Tasikmalaya, Kode Pos 46115

🗨 Principal :  
Reny Hidayati(+62 823 1012 3102)

🗨 Support :  
Ristina Siti Sundari(+62 823 2168 8908)



This work is licensed under a Creative Commons Attribution 4.0 International License.

---

## EFFICIENCY OF PRODUCTION FACTORS USAGE IN ENVIRONMENTALLY CONSCIOUS POTATO FARMING IN KARANGREJA DISTRICT, PURBALINGGA REGENCY

Ayu Sitanini<sup>1\*</sup>, Victor Bintang Panunggul<sup>1</sup>, Dwi Kurniawati<sup>1</sup>, Raflina Nurwanda Ningsih<sup>1</sup>

<sup>1</sup>Department Agribusiness, Faculty of Science and Engineering, Perwira Purbalingga University

Corresponding author : [ayusitanini@gmail.com](mailto:ayusitanini@gmail.com)

Submitted: 14<sup>th</sup> June 2023; Revised: 20<sup>th</sup> August 2023; Published: 8<sup>th</sup> February 2024

### ABSTRACT

The main problem in potato farming is the problem of efficient use of production factors. Efficient use of production factors will determine the size of profits. National-level potato productivity is decreasing from year to year. National-level potato productivity in 2023 will be 19.27 tons/ha. Potato productivity in Karangreja District is 14,715 tonnes/ha, below the national average. The research aimed to describe the environmental conditions in the area due to potato crops and analyze the influence of product factors on productivity and price/allocative efficiency in potato farming in Karangreja District, Purbalingga Regency. The research method used is a survey, which uses simple cluster sampling. The analysis method uses financial analysis methods, and multiple linear regression analysis (Cobb Douglas production function). Seeds, manure, organic fertilizers, pesticides, and the area of land used cannot be increased to increase product per unit area. Physically, the workforce used can still be increased to improve the product. At the price level of potato products of IDR 8,000 and labor wages of IDR 40,000, the use of labor in potato farming in Karangreja District already provides maximum profits

**Keywords:** Efficiency; Farming; Environmentally Minded

### ABSTRAK

*Permasalahan utama pada usahatani kentang adalah masalah efisiensi penggunaan faktor produksi. Penggunaan faktor produksi yang efisien akan menentukan besarnya keuntungan. Produktivitas kentang tingkat nasional dari tahun ketahun semakin menurun. Produktivitas kentang tingkat nasional tahun 2023 sebesar 19,27 ton/ha. Produktivitas kentang di Kecamatan Karangreja sebesar 14,715 ton/ha, di bawah rata-rata nasional. Tujuan penelitian adalah untuk menggambarkan kondisi lingkungan di daerah penelitian akibat tanaman kentang dan menganalisis pengaruh faktor produk terhadap produktivitas, dan efisiensi harga/alokatip pada usahatani kentang di Kecamatan Karangreja Kabupaten Purbalingga. Metode penelitian yang digunakan adalah metode survei, metode pengambilan sampel menggunakan simple cluster sampling. Metode analisis menggunakan metode analisis finansial, analisis regresi liner berganda (fungsi produksi Cobb Douglas). Benih, pupuk kandang, pupuk organik, pestisida dan luas lahan penggunaannya sudah tidak dapat ditingkatkan, untuk meningkatkan produk persatuan luas. Secara fisik tenaga kerja penggunaannya masih dapat ditingkatkan untuk meningkatkan produk. Pada tingkat harga produk kentang sebesar Rp8.000 dan upah tenaga kerja sebesar Rp40.000,- penggunaan tenaga pada usahatani kentang di Kecamatan Karangreja sudah memberikan keuntungan maksimum.*

**Kata kunci:** Efisiensi; Usahatani ; Berwawasan Lingkungan

## INTRODUCTION

One potato-producing area in Central Java is Karangreja District, located at the foot of Mount Slamet at 790 meters above sea level. Most farmers who have land at these heights are engaged in farming. The natural conditions are suitable for growing potato plants so that they can be a source of income for the community to meet their needs and maintain their survival.

The problems of farming annual crops on dry, sloping land are very diverse, so if they are managed well, they will maintain the balance of the environment. These disturbances include (a) soil and water erosion, (b) decreasing land fertility levels, (c) decrease in land productivity, (d) the occurrence of natural disasters such as floods and landslides, (e) shallowing of the river, which results in the useful life of the reservoir being reduced (Kusmanto, 2010).

One of the leading national vegetable commodities the government prioritizes for development is potatoes (*Solanum tuberosum* L). Potatoes are a popular commodity that is easy to develop into various preparations, including chips, potato *chips*, starch, flour, *French fries*, and other preparations that can increase farmers'

income. The growth in domestic consumption with a population of around 270 million has resulted in vast open market opportunities, meaning that the availability of potatoes must always be guaranteed, opening up opportunities for expanding potato production (Anggraeni, 2015).

The large Number of regions that are potato production centers makes it possible to develop highland potato cultivation and production in Indonesia (Desy *et al.*, 2021). According to the Central Statistics Agency (2020), 22.8% of national potato production comes from Central Java. In 2020, potato production was 293,936 tons and ranked second after East Java, contributing 23.77%. Previous research results have not discussed much about the impact of excessive use of pesticides. So, the contribution of the research results includes the impact of excessive use of pesticides, causing acute respiratory infections in farmers. The results of research by Rosmawati (2015) show that the decline in potato production in Bengkulu province esp, especially in the research area, is caused by several factors, namely farmers switching to planting other commodities, namely coffee, which is considered more profitable and planting potatoes

requires relatively high capital and the risk of failure is also high. Large enough, farmers are generally less interested in planting potatoes. Rahmah and Wulandari (2021) stated that the income from potato farming was IDR. 133,634,318 per hectare with a total cost of Rp. Ninety-eight million eighty-two thousand six hundred eighty-six per hectare, and the income received was IDR. 35,551,632 per hectare. The results of the farming feasibility analysis obtained an R/C value of 1.36, which shows that potato farming is worth running.

This research aims to describe the environmental conditions in the research area due to potato crops and analyze the influence of product factors on productivity and price efficiency/allocation in potato farming in Karangreja District, Purbalingga Regency. One potato-producing area in Central Java is Karangreja District, located at the foot of Mount Slamet at 790 meters above sea level. Most farmers who have land at these heights are engaged in farming. The natural conditions are suitable for growing potato plants so that they can be a source of income for the community to meet their needs and maintain their survival.

The problems of farming annual crops on dry, sloping land are very diverse, so if they are managed well, they will maintain the balance of the environment. These disturbances include (a) soil and water erosion, (b) decreasing land fertility levels, (c) decrease in land productivity, (d) the occurrence of natural disasters such as floods and landslides, (e) shallowing of the river, which results in the useful life of the reservoir being reduced (Kusmantoro, 2010).

One of the leading national vegetable commodities the government prioritizes for development is potatoes (*Solanum tuberosum* L). Potatoes are a popular commodity that is easy to develop into various preparations, including chips, potato *chips*, starch, flour, *French fries*, and other preparations that can increase farmers' income. The growth in domestic consumption with a population of around 270 million has resulted in vast open market opportunities, meaning that the availability of potatoes must always be guaranteed, opening up opportunities for expanding potato production (Anggraeni, 2015).

The large Number of regions that are potato production centers makes it possible to develop highland

potato cultivation and production in Indonesia (Desy *et al.*, 2021). According to the Central Statistics Agency (2020), 22.8% of national potato production comes from Central Java. In 2020, potato production was 293,936 tons and ranked second after East Java, contributing 23.77%. Previous research results have not discussed much about the impact of excessive use of pesticides. So, the contribution of the research results includes the impact of excessive use of pesticides, causing acute respiratory infections in farmers. The results of research by Rosmawati (2015) show that the decline in potato production in Bengkulu province esp, especially in the research area, is caused by several factors, namely farmers switching to planting other commodities, namely coffee, which is considered more profitable and planting potatoes requires relatively high capital and the risk of failure is also high. Large enough, farmers are generally less interested in planting potatoes. Rahmah and Wulandari (2021) stated that the income from potato farming was IDR. 133,634,318 per hectare with a total cost of Rp. Ninety-eight million eighty-two thousand six hundred eighty-six per hectare, and the income received was IDR. 35,551,632 per hectare. The results

of the farming feasibility analysis obtained an R/C value of 1.36, which shows that potato farming is worth running.

This research aims to describe the environmental conditions in the research area due to potato crops and analyze the influence of product factors on productivity and price efficiency/allocation in potato farming in Karangreja District, Purbalingga Regency.

## RESEARCH METHODS

The research was carried out on April 2023 in Karangreja, Purbalingga Regency, Central Java. Purposively due to considerable as center potatoes in the District Purbalingga.

The sampling method used a simple cluster sampling, which is a method where the population studied is divided into groups, and these groups become sample units (samples) studied. The Number of sample farmers is calculated based on the following formula:

$$n = \frac{N \sum N_h \cdot sh^2}{\frac{N^2 \cdot d^2}{z^2} + \sum N_h \cdot sh^2}$$

The Number of sample farmers in each stratum is calculated using the following formula

$$nh = \frac{Nh.n}{N}$$

$$sh^2 = \frac{\sum (Xi - \bar{X})^2}{n-1}$$

Notification:

- n = Number of sample farmers
- nh = Number of sample farmers in each stratum
- N = Number of Population
- Nh = Number of elementary units in each stratum
- sh = Standard deviation of the hth stratum
- z = normal variable (2)
- Xi = potato production per hectare

### Types and Techniques of Data Collection

Data collection techniques for research purposes were carried out in three ways, namely: interviews using a list of questions that had been prepared in advance, recording, namely recording secondary data sourced from Service Offices or Institutions related to this research and observation, namely directly observing potato farming activities at the location. Study.

### Analysis Method

Estimation of estimated parameters using the Cobb-Douglas production function:

$$\ln Y = \alpha_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6$$

Notification:

- Y = potato productivity (kg)
- X1 = seeds (kg)
- X2 = labor (HOK)
- X3 = manure (kg)
- X4 = inorganic fertilizer (kg)

- X5 = farmer education (years)
- X6 = farmer's age (years)
- X7 = farming experience (years)
- A = intercept
- $\beta_1, \beta_2, \dots, \dots$  = regression coefficient

The analysis model uses the coefficient of determination ( $R^2$ ), F test (*overall test*), and t-test (*individual test*), namely:

(b) The next test is to test whether the independent variables together affect the dependent variable using the F test, with the following hypothesis formulation:

$$H_0: \alpha_1, \dots, \alpha_8; \beta_1, \dots, \beta_3; d_1, \dots, d_i = 0$$

$$H_a: \text{at least one of } \alpha_i, \beta_i, \neq 0$$

$$F_{hitung} = \frac{R^2 / (k-1)}{(1-R^2) / (n-k)}$$

Notification:

- $R^2$  = coefficient of determination
- k = Number of independent variables
- n = Number of samples

The testing criteria are as follows:

"If the calculated F is greater than the F table ( $\alpha\%$ , nk-1), then the null hypothesis ( $H_0$ ) is rejected. This means that the independent variables together statistically significantly affect the dependent variable.

Meanwhile, to find out whether individual independent variables statistically have a natural effect on the dependent variable, a t-test is carried out with the following hypothesis formulation:

Ho:  $\alpha_i, \beta_i = 0$  and  $H_1: \alpha_i, \beta_i \neq 0$

Information:

$R^2$  = coefficient of determination

k = Number of independent variables

n = Number of samples

The testing criteria are as follows:

"If  $F_{count}$  is greater than  $F_{table}$  ( $\alpha\%$ ,  $n-k-1$ ), then the null hypothesis ( $H_0$ ) is rejected. This means that the independent variables statistically significantly affect the dependent variable together.

Meanwhile, to find out whether individual independent variables statistically have a natural effect on the dependent variable, a t-test is carried out with the following hypothesis formulation:

Ho:  $\alpha_i, \beta_i = 0$  and  $H_1: \alpha_i, \beta_i \neq 0$

$$t_{hitung} = \frac{\alpha_i; \beta_i}{S\alpha_i, Sb_i}$$

Information:

$\alpha_i, \beta_i$  = estimated regression coefficients

$S\alpha_i, Sb_i$  = standard error of the estimated regression coefficient

If the  $t_{critical}$  is higher than  $t_{table}$  ( $0,5\alpha\%, n-k$ ), then  $H_0$  is not accepted, meaning that the independent variable statistically has a significant effect on the dependent variable.

Then, test classical assumptions: normality test, multicollinearity test,

and heteroscedasticity test to see whether the confounding variables from all observations have the same/constant variance. The method used to detect heteroscedasticity is the White method.

Allocative efficiency (price) will be achieved if the marginal product value of a production factor (MPV<sub>xi</sub>) is equal to the Marginal Victim Cost (BKM<sub>xi</sub>), which is expressed in the formula:

### MPV<sub>xi</sub>

If  $MPV_{xi} < 1$ , then the use of production factors is inefficient

If  $MPV_{xi} = 1$ , then the use of production factors is efficient

If  $MPV_{xi} > 1$ , then the use of production factors is not efficient

## RESULT AND DISCUSSION

### Respondent Profile

The Number of respondents was 39 potato farmers. The average farmer's land ownership is 0.18 ha. Based on age data, most respondents are still of productive age (92%). The highest education level of respondents was elementary school at 66% and secondary school at 34%. The average Number of respondents' family members is three people, the highest is five people, the lowest is two people, and the average Number of respondents' family dependents is three.

In potato farming, farming costs incurred by farmers vary according to the area of potato cultivation land. Farming costs consist of fixed costs and variable costs. Fixed costs include land rental costs, hand sprayer rental, land

tax, and equipment depreciation. Variable costs include purchasing inputs such as seeds, inorganic fertilizers, pesticides, and labor. Details of costs and ncome can be seen in Table 1.

**Table 1.** The results of productivity calculations from potato farming in Karangreja

No	Variable	Highest	Lowest	Average
1	Seed ( kg)	2,500	769	1,458
2	Labor ( H OK)	480	401	473
3	Manure (kg)	50,000	5000	10,000
4	manure (kg)	7,692	260	2,459
5	Pesticide (Rp)	2,961,538	12,000	2,081,714
6	Productivity kg/ha	18,000	10,143	14,715

Source: Sitanini *et al.* (2023)

Potato farmers use only one variety of potato seeds: granola or vegetable potatoes. Most farmers use their own harvested potato seeds and their offspring because the price of seeds from breeders is high and limited. Several farmers buy G3 seeds from breeders and cultivate them up to G5. Potato seeds used by farmers are generally medium-sized seeds (S) containing approximately  $\pm 20$  knol/kg, which are called the DN class category. The average amount of potato seeds farmers use for potato farming is 1,458/ha.

Potato average product produced by potato farmers is 14,715 kg/ha. There are three types of sizes of potato products produced by farmers,

namely large potatoes called class AB (6-8 knol/kg), class N (16-20 knol/kg), and class Rindil (30-40 knol/kg). The price of potatoes depends on their size; class AB is the most expensive.

Most of the workers used for potato farming come from outside the family, and a small number come from farming families. The workforce consists of female and male workers. Women's labor is used for planting, repairing bunds, and repairing plastic mulch (for those who use mulch). The average Number of workers used by farmers is 401 MWD.

Farmers use various types of inorganic fertilizers, and their composition varies. There are five types of fertilizer used by farmers, namely

Urea, SP36, KCl, NPK, and Phonska. Some farmers use a mixture of Urea + KCl + Phonska. Some use Urea + Phonska or SP36 + Urea + Phoskha, and some only use Urea due to cost issues.

Potato farmers generally use organic fertilizer in the form of manure, namely chicken manure (chicken feces), which is ready to be used as fertilizer. These chicken droppings cause environmental impacts in the form of odors and flies. Manure in the form of manure, before use, is often placed on the side of the road, causing a powerful odor. Moreover, manure waste will be carried by water flowing in all directions during the rainy season. The environmental impact of manure causes crowds of flies, so houses around potato gardens have lots of flies. The average manure used for potato farming is 10,000 kg/ha.

Potato farming uses quite a lot of pesticides to maintain plant life. Potato plants originate from sub-tropical climates. Indonesia is a country in the tropical region, so the potato plant has many problems, starting from high rainfall and pest plant organisms. At the beginning of their growth, potato plants are very vulnerable to rainfall, so if it rains, farmers will spray the potato plants with pesticides. Kusmantoro *et*

*al.*(2009) show that the use of pesticides in potato farming does not consider the economic threshold value. The method they use is a scheduled spraying method. There are "blank 3" (meaning pesticide spraying is done every two days), "blank 4" (meaning pesticide spraying is done once every three days), and "blank 5" (meaning pesticide spraying is done once every four days). Many pesticide *brands are* used, namely 47 pesticide *brands* consisting of insecticides and fungicides. In general, spraying is done by mixing insecticide and fungicide, although often neither is needed.

Potato farming costs in Karangreja District include fixed costs and variable costs. Fixed costs in research include land rental costs and land taxes. Farmers pay an average of IDR 1,273,809 for renting land for potato farming. The average cost of using potato seeds per hectare is IDR 30,362,379, pesticides are IDR 2,081,714, organic fertilizers are IDR 8,660,872, inorganic fertilizers are IDR 2,081,214 and average labor costs are IDR 9,194,297. The total costs incurred by farmers for potato farming are IDR 53,156,844/ha, while the income obtained by farmers is an average of IDR 137907378.13. So, farmers' profit

from potato farming in Karangreja District is IDR 84,750,533.69.

**Production**

**Function Analysis**

The production function is a technical relationship between the independent and dependent

variables, drawn in the form  $Y = f(X)$ . Factors that influence potato production are seed, manure, organic fertilizer, pesticides, and labor. The production function used Cobb-Douglass Production Function, as seen in Table 2.

Tabel 2. Analysis Multiple Linear Regression *Input* dan *Output* on Potato Crop Farming

Variable	Coefisien	Std. Error	t-Statistic	Probability
C	1,1195	3,3642	0,3327	0,3327
Seed	0,1100	0,1592	0,6911	0,4944
Land	-0,1121	0,4070	0,2754	0,7847
Pesticide	0,0065	0,1232	0,5398	0,5930
Anorganic Fertilizer	-0,0392	0,0814	0,4821	0,6330
Organic Fertilizer	0,1842	0,1427	0,2907	0,2060
Labor	0,8794	0,4092	2,1487	0,0393
R <sup>2</sup>	0,7465			
F-statistic	15,7060			0,0000

Resources: Primary data Analysis, 2023

There is only one variety of potato seed farmers use for organic rice farming in Karangreja District, Purbalingga Regency, namely the granola variety, and some still need to be certified. Adding or subtracting seeds does not increase or decrease the potato product. Potato seeds have no natural effect on potatoes because the seeds used by farmers come from G3, which has low productivity. This result was different from research by Edison et al. (2004), which states that seeds play a dominant role in increasing potato production.

The pesticide regression coefficient does not significantly affect

the product, meaning that additional use of pesticides in potato farming cannot increase or decrease potato production. Farmers who use pesticides no longer pay attention to the economic threshold value. The amount of costs incurred shows that the use of pesticides has exceeded the capacity needed to control organisms. Pesticide spraying is no longer based on attacks by pest organisms but is already scheduled at the start of cultivation. For example, farmers plan to spray once every five days, with the term empty five or empty 3 (every three days). This situation is supported by research by Gultom (2018), who found that various

pesticides have exceeded optimal levels because the  $MPV/P_x$  value is smaller than 1.

Using organic fertilizer does not affect increasing or decreasing potato production. The average amount of organic fertilizer farmers reached 10,000 kg/ha. Organic fertilizer can improve the physical, chemical, and biological soil by gradually releasing nutrients into the soil water solution to plant, maintain and help regulate temperature and humidity, increase the amount, and increase biological activity and stability of land capabilities (Sufianto, 2013). From this explanation, the use of organic fertilizer needs to be improved.

Inorganic fertilizers used by farmers in Karangreja include Urea, Phonska, KCl, and Sp36. Organic fertilizer did not affect the product, meaning each addition will not increase or decrease potato production. This

result differs from research by Agatha and Wulandari (2018), stating that the regression coefficient for chemical fertilizers is -0.323 and is significant. This value showed that % increase in chemical fertilizers by 1% will reduce production by 32.3%, which means that the more chemical fertilizers used, the more there is a tendency to reduce output.

**Efficiency of Production Factors Usage**

Efficiency of Production Factors Usage is often called price or allocative efficiency. Analysis of the efficient use of production factors is used to determine whether the use of production factors in a farming business is efficient or not/inefficient. Price efficiency analysis is only used for inputs that directly affect output. The results of the price efficiency analysis of input use in potato farming are presented in Table 3.

Tabel 3. Input Utility Efficiency on Potato Crops Farming

Variable	Input price	Marginal Product Value ( $MPV_{xi}$ )	$(MPV_{xi})/ P_x$
Labor	40.000	105.948.000	211.896

Resources: Primary data Analysis, 2023

The labor use efficiency analysis results 211,869 are greater than one and significant at the 95% confidence level. This condition shows that the use of labor is efficient. This value showed that

farmers can manage the use of labor according to their needs. Efficient use of labor means that the use of labor provides maximum profits for potato farming. In contrast, research by Deras

and Sinulingga (2021) shows that using labor could be more efficient. The use of labor in the research area differs from the recommended amount, namely 416.08 MWD/ha.

### CONCLUSION

Based on the results of the analysis and discussion, it can be concluded:

1. Seeds, manure, organic fertilizers, pesticides and the area of land used cannot be increased to increase product per unit area. Physically, the workforce can still be used to improve the product.
2. At the price level of potato products of Rp. 8,000 and labor wages of Rp. 40,000,- the use of labor in potato farming in Karangreja District is already profitable.

### REFERENCES

- Agatha M.K, Wulandari E. 2018. Analisis Faktor-faktor yang Mempengaruhi Produksi Kentang di Kelompok Tani Mitra Sawargi Desa Barusari Kecamatan Pasirwangi Kabupaten Garut. *Jurnal Ilmiah Mahasiswa Agroinfo Galuh*. Volume 4 No 3 Hal 772-778.
- Anggraini N. 2015. Efisiensi Pada Usahatani Ubikayu di Kabupaten Lampung Tengah Provinsi Lampung. *Tesis*. Institut Pertanian Bogor, Bogor
- Arifin. 2015. *Pengantar Ekonomi Pertanian*. Mujahid, Bandung.
- [BPS] Badan Pusat Statistik dan Direktorat Jenderal Hortikultura. 2020. *Luas Panen, Hasil Produksi dan Produktivitas Kentang di Jawa Tengah tahun 2015-2019*. BPS Provinsi Jawa Tengah. Jawa Tengah.
- Debertin, . D., L. 2012. *Agricultural Production Economics*. Second Edition. University of Kentucky
- Desy, C.U., & Wenny, M. 2021. Efisiensi teknis usahatani kentang pada luas lahan yang berbeda di kabupaten Pasuruan. *Jurnal Agromix*, 12(2), 33-42.  
<https://doi.org/10.35891/agx.v12i2.2577>
- Edison, S., & Rachmat H. 2004. Analisis Efisiensi Ekonomis Usahatani Kentang Di Kayu Aro Kabupaten Kerinci, Jambi. *Jurnal Pengkajian dan Pengembangan Teknologi Pertanian*. Universitas Jambi. *Jurnal Pengkajian dan Pengembangan Teknologi Pertanian* Vol. 7, No.1, Januari 2004 : 34-42
- Gultom, L. 2018, Analisis Tingkat Optimasi Faktor-Faktor Produksi Usaha tani Kentang (solanum tuberosum) (Studi Kasus: Desa Purbatua Baru, Kecamatan Silimakuta, Kabupaten Simalungun Propinsi Sumatera Utara), Universitas Medan Area. *Jurnal Agrica* Vol.11 No.1/AApril 2018
- Kusmantoro Edy S, 2010, Usaha Tani Kentang Dengan Teknik Konservasi Teras Bangku Di Dataran Tinggi Dieng Kabupaten Wonosobo Jawa Tengah, (*Potato Farming Using Bench Terrace Technique At Dieng Highland*)

Wonosobo Regency Central Java),  
Jurusan Sosial Ekonomi Fakultas  
Pertanian Universitas Jenderal  
Soedirman. Jurnal Pembangunan  
Pedesaan Vol. 10 Nomor 2,  
Desember 2010, (115-127).

Onifasia Adah, Agnes Quartina  
Pudjiastuti, & Ninin Khoirunnisa,  
2022, Faktor Penentu Produksi  
Kentang Granola Kembang Di  
Desa Sumber Brantas Kecamatan  
Bumiaji Kota Batu, Universitas  
Tribhuwana Tungga Dewi, Jurnal  
Agrica Vol.11 No.1/AApril 2018  
ISSN 1979-8164.

Rosmawati, Henny. 2015. Analisis  
Faktor-Faktor Produksi Pada  
Usaha Tani Kentang di Desa Ujan  
Mas, Kecamatan Dempo Utara,  
Kota. Pagar Alam. Universitas  
Baturaja. Jurnal SOCIETA IV - 1 :  
59 - 61, Juni 2015.

Sufianto, 2013, Kajian Aplikasi Pupuk  
Organik Pada Penanaman  
Kentang Dengan Ukuran Umbi  
Bibit Berbeda (Study of Organic  
Fertilizer Application on Potato  
Planting the Seed Tuber Size  
Different), Jurusan Agronomi,  
Fakultas Pertanian Peternakan,  
Universitas Muhammadiyah  
Malang. Jurnal GAMMA, I Maret  
2013: 98 - 107 Volume 8, Nomor 2,  
Maret 2013: 98 - 107

Stefanus Deras & Helviani Sinulingga,  
2021, Efisiensi Penggunaan  
Faktor-Faktor Produksi Pada  
Usahatani Kentang di Desa Kaban  
Kabupaten Karo, Fakultas  
Pertanian, Universitas Katolik  
Santo Thomas Medan.  
[https://doi.org/10.54367/agriust.v  
2i1.1790](https://doi.org/10.54367/agriust.v2i1.1790)