
Revenue Analysis of Intercropping Farming Between Corn and Sweet Potato (Case Study in Kediren Village, Kalitengah Dstrict, Lamongan Regency)

Emmy Hamidah^{*1}, Idum Satia Santi², Rizqi Putu Abdullah³

¹Agrotechnology Study Program, Faculty of Agriculture, Darul Ulum Islamic University Lamongan, Lamongan, Indonesia.

²Agrotechnology Study Program, Faculty of Agriculture, Institute Pertanian STIPER Yogyakarta, Yogyakarta, Indonesia.

³Kalitengah district Agricultural Extension Center, Food Security and Agriculture Service Lamongan Regency.

*Corresponding author: emmyhamidah@unisda.ac.id

Article History: Received: 30 Mei 2025, Final Revision: 02 Juny 2025, Accepted: 15 July 2025, Online Publication: 30 July 2025

ABSTRACT

The study of income analysis of intercropping between corn and Sweet potato in Kediren Village, Kalitengah District, Lamongan Regency aims to determine the income of sweet potato farming and sweet corn farming. This research was conducted from September to November 2024 The method used in this study was a survey. Data collection was carried out through interviews and observations. Sampling used a non-probability sampling technique. The population in this study amounted to 30 people so that all respondents were taken as samples. The location of the study in Kediren Village, Kalitengah District, Lamongan Regency was determined purposively because it met the criteria set by the researcher. Thus, it is expected to answer the existing problems. Based on the research results, it can be seen that the production costs of farmers who carry out corn and sweet potato intercropping in Kediren Village, Kediren District, Lamongan Regency, it can be seen that the total cost of corn and sweet potato intercropping is Rp. 32,337,400,--. Corn income is 18,618,400,-- and sweet potato is Rp. 13,719,000,--. The difference in income between corn and sweet potatoes is Rp 4,899,400,-. This study shows that the harvest that is only planted with corn, the income is Rp 32,000,000,- compared to intercropping between corn and sweet potatoes, the income is Rp 54,200,000,-

Keywords: farmer income, intercropping, sweet potato, sweetcorn

INTRODUCTION

Indonesia is one of the countries that has quite extensive and fertile natural resources. The climate, temperature, and humidity conditions are suitable for the needs of staple food crop growth, so that it can be cultivated as a relatively well-

growing agricultural business (Fauzan Maulana et al., n.d.). Development of the agricultural sector can be carried out on various types of plants, both horticultural plants, plantations and secondary crops. Secondary crops developed in Indonesia

include corn, cassava, sweet potatoes, green beans, peanuts, and soybeans (Sapakhova et al., 2023).

Secondary crops such as sweet potatoes and corn are superior products from each sub-district in Lamongan Regency. Sweet potatoes are an important food ingredient because they are one of the sources of carbohydrates after rice, corn, and cassava (Sulistiani et al., 2020). In addition, sweet potatoes are also widely used as raw materials for industry, both food and non-food industries (Hamidah et al., 2021). The demand for sweet potatoes continues to increase because of their wide use, both as raw materials and as raw materials for making sauces, animal feed and others as well as semi-finished products such as sweet potato flour (Gao et al., 2021). Lamongan Regency is one of the areas that has great potential in the agricultural sector, fertile and extensive land is one of the factors that can support agricultural progress in Lamongan Regency. Various types of food crops have been cultivated, both on dry land and rice fields. The production of food crops in Lamongan Regency, especially corn and sweet potatoes, is quite large (Rizzolo et al., 2021).

Corn and sweet potato plants are often planted by farmers both on dry land and rice fields (Ulfa et al., 2020). The planting systems used by farmers in farming on rice fields are very diverse, both intercropping and monoculture. In this case, farmers in Lamongan Regency use an intercropping system for sweet potato and sweet corn plants. The intercropping planting system is

often carried out by farmers to utilize planting distances and increase income (Nayan et al., 2020). The intercropping system of corn and sweet potato plants is chosen as one form of efficiency in land use. The intercropping system between corn and sweet potato can be carried out in one area because these two types of plants can grow together without disturbing each other (Rizzolo et al., 2021). In addition, the provision of fertilizers and agricultural medicines can be carried out simultaneously, so that it does not incur additional costs for farmers. Another advantage of the intercropping pattern is that in addition to receiving income from corn sales, farmers also receive additional income from sweet potato sales, so that if the corn harvest fails or there is a drastic price drop, farmers still have sweet potatoes that can cover losses from sweet potato cultivation (Abriani et al., 2023).

The amount of costs incurred by farmers in cultivating sweet potatoes and the diversity of farming efforts carried out will affect farmers' income (Fauzi Rio et al., 2024). Therefore, a farming business analysis is needed to see the influence of total income and total costs incurred on the income of corn and sweet potato farming businesses with an intercropping system (Mokalu et al., 2022). This is what underlies the researcher to conduct a study on the Analysis of Income from Intercropping Corn and Sweet Potato Farming in Kediren Village, Kediren District, Lamongan Regency.

MATERIALS AND METHODS

This study analyzes the feasibility of corn farming with intercropping patterns with sweet potatoes. Based on the research objectives, the research method uses a descriptive method. Descriptive research is a study conducted to determine the value of independent variables, either one or more variables (independent) without making comparisons or connecting with other variables (Anggraeni et al., 2021). Population is a generalization area consisting of objects or subjects that have certain qualities and

characteristics determined by the researcher to be studied and then conclusions drawn (Listyora et al., 2023).

Respondents were selected based on information obtained from Field Extension Officers in Kediren Village. The number of respondents used as samples in this study was 30 farmers who were still active in sweet potato farming activities with an intercropping pattern corn with sweet potato in Kediren Village. This research was conducted from September to November 2024. The variables

in this study include: total farming costs, farming revenues and farming income (Fauzan Maulana et al., 2022). The total costs in the study are fixed costs and variable costs. Fixed costs include depreciation costs for agricultural equipment. While variable costs include the cost of seeds, fertilizers, pesticides and labor. Farming revenue referred to in this study is the amount of money obtained from the sale of a number of outputs (Anggraini et al., 2022). The total revenue can be obtained by multiplying the number of units of goods sold by the price of the goods concerned.

RESULTS AND DISCUSSION

Agriculture is a science that studies how a person manages production factors in the form of land and the surrounding environment as capital so as to provide the best possible benefits. Agriculture is an applied science that discusses or studies how to use resources efficiently in an agricultural, livestock, or fishery business. Agriculture is a collection of natural resources found in that place that are needed for agricultural production such as plants, soil, and water, improvements to the land, sunlight, and buildings built on the land and so on (Donkor et al., 2020).

Farm Income Analysis is divided into two definitions, namely: gross income, which is all income obtained by farmers in farming for one year which can be calculated from the results of sales or exchange of production results which are valued in rupiah based on the price per unit weight at the time of harvesting the results. Net income, which is all income obtained by farmers in one year minus production costs during the production process. Production costs include real labor costs and real costs of production facilities. In farm income there are two elements used, namely the elements of income and expenditure from the farm (Rahmawati et al., 2020).

Intercropping

Intercropping is one of the farming methods that mixes the planting process (polyculture), in the

Farming income is the income obtained by farmers after deducting production costs (El Yasin & Pudjiastutik, 2019)

The characteristics of respondents in this study are divided into several aspects, namely the age of respondents, the number of family members who are dependents, education level, farming experience, the area of land owned and the costs used in farming. Knowledge of respondent characteristics can influence respondents' decisions in managing the farming they run (Al-Hafidz, 2021).

same land and at the same time. This is done to achieve high production because with intercropping the main plants can grow properly and are not disturbed by the intercropping plants (Sapakhova et al., 2023). Examples of intercropping plants include corn and soybeans, corn and sweet potatoes or corn and peanuts. In the intercropping planting system, there are several advantages, namely: the risk of loss will be reduced because in planting it will cover each other between expenses and income, it can maximize small land to be more potential and the nutrients planted will be much more useful because in one area it can be absorbed by plants well and not wasted. The intercropping system also has disadvantages, namely the possibility of fighting for nutrients in the soil which can result in the need for nutrients from nutrients increasing (Nayan et al., 2020).

Corn Farming Activities with Sweet Potatoes

Intercropping of corn with sweet potatoes is a business that has long been carried out by the residents of Kediren Village, Kediren District, Lamongan Regency. This can be seen from the level of experience of farmers who have on average been working on intercropping of corn with sweet potatoes for more than 20 years. Farming activities are carried out by identifying planting patterns, use of production inputs, cultivation techniques, and

outputs produced from intercropping of corn with sweet potatoes. (A Efisiensi et al., 2023).

Costs, Revenue and Income of Corn and Sweet Potato Farming

The cost components of corn and sweet potato farming include fixed costs and variable costs. Revenue is the result of multiplying the amount of production by the price of the commodity, while income is revenue minus production costs. (Anggraini et al., 2022).

Cost of Intercropping Corn with Sweet Potatoes

The costs in this study include fixed costs and variable costs. Fixed costs are costs that are not used up in one production period. Fixed costs in this study are land rental costs and depreciation of agricultural equipment. Variable costs are Variable costs (fixed costs) are costs whose amount is influenced by the amount of production. Variable costs in this study are the cost of seeds, fertilizers, pesticides and labor (Kakabouki et al., 2020).

Table 1. Average Cost of Intercropping Corn and Sweet Potato Farming in Kediren Village, Kalitengah District, Lamongan Regency in 1 Planting Season

No	Description	Cost (Rp/Ha)	Cost (Rp/Ha)
		Corn	Sweet Potato
1.	Seed Variable Costs	3.000.000,-	1.000.000,-
	Fertilizer	2.600.000,-	1.700.000,-
	Pestisida	1.200.000,-	1.000.000,-
	Labor	5.800.000,-	4.000.000,-
2.	Fixed Cost		
	tool depreciation	781.600,-	781.600,-
	Total Cost	3.381.600,-	8.481.000.-

Source: Primary Data Analysis, 2024

The total cost of intercropping corn with sweet potatoes is the addition of fixed costs and variable costs incurred during the farming process, the calculated value is an average of Rp/Ha. Fixed costs include land rental and equipment

depreciation. The table above shows that the average fixed cost incurred is Rp. 781,600.-/Ha, while the average variable cost is Rp. 10,150,000,-/Ha. So the average total cost is Rp. 10,931,300.-.

Table 2 Average Revenue of Corn Intercropping with Sweet Potatoes in Kediren Village, Kalitengah District, Lamongan Regency in 1 Planting Season

No	Description	Production (kg)	Price	Average Acceptance (Rp/Ha)
1	Sweet Corn (Rp/kg)	8000	4.000	32.000.000
2	Sweet potato (Rp/Kg)	7.400	3.000.	22.200.000
Penerimaan				54.200.000

Source: Primary Data Analysis, 2024.

The farm income analyzed is cash income from the multiplication of the total production of corn intercropping with sweet potatoes in the form of selling prices received by farmers. Shows that the

average total cash income of corn intercropping with sweet potatoes in Kediren Village is Rp.54,200,000.-/Ha.

Table 3. Average Total Income of Sweet Corn and Sweet Potato Intercropping Farming Business in Rasau Jaya Village 1 in 1 Planting Season

No	Uraian :	Jumlah (Rp/ Ha)
1	Corn Acceptance (Rp/Ha)	32.000.000,-
2	Sweet Potato Acceptance (Rp/Ha)	22.200.000,-
3	Total Receipts (Rp/Ha)	54.200.000,-
4	Total Cost of Corn (Rp/ Ha)	13.381.600,-
5	Total Cost of Sweet Potato (Rp/Ha)	8.481,000,-
6	Corn Income (Rp/Ha)	18.618.400,-
7	Sweet Potato Income (Rp/Ha)	3.719.000,-
8	Total Income of Sweet Potato with Corn (Rp/Ha)	32.337.400,-

Source: Primary Data Analysis, 2024.

This study is the income of corn and sweet potato intercropping farmers in one planting season. Based on the table above, it shows that the total income from corn and sweet potato intercropping is IDR 54,200,000. Corn income is IDR 18,618,400 and sweet potato income is IDR

13,719,000. So, the total income from corn and sweet potato is IDR 32,337,400. The difference in income between corn and sweet potato is IDR 4,899,400. This study shows that the yield from corn is greater than the yield from sweet potato.

CONCLUSION

The application of palm co-products (empty bunches, mesocarp fibers, and suspended solids) as mulch and NPKMg fertilizers (15:15:6:4) at 12, 10, and 8 grams/biweekly/seed doses can improve 9-month-old palm oil seed growth in the MN. The best seed growth is produced by empty bunches at a dose of 8 grams/biweekly/seed.

Co-product types and NPKMg doses applied affect nutrient use efficiency (NUE) of palm oil seeds in the MN. NUE increases following the decreasing NPKMg applied doses (8 >10>12 grams/biweekly/seed).

ACKNOWLEDGEMENT

The results of the analysis of intercropping production between corn and sweet potatoes show that sweet potatoes as a second crop are 7,400 kg/ha, corn production as the main crop is 8000 kg/ha. The income from corn crops is Rp 18,618,400, - greater than that of sweet potatoes by Rp 13,719,000, - while the total

income from intercropping between corn and sweet potatoes is Rp 32,337,400, -. The total income from intercropping corn with sweet potatoes is Rp 54,200,000. For farmers, it is recommended that in order to increase income, it is necessary to expand land management for intercropping between corn and sweet potatoes

because the income obtained is greater than only cultivating corn farming.

REFERENCE

- Abriani, D. M., Lestari, D. A. H., & Haryono, D. (2023). The Effect of Government Policy and Market Failure on Divergence of Cassava Competitiveness in South Lampung. *Jurnal Manajemen Dan Agribisnis*. <https://doi.org/10.17358/jma.20.1.130>
- Al-Hafidz, Z. (2021). A value chain analysis of sweet potato commodity marketing. *Jurnal Ekonomi Dan Bisnis*, 24(1), 99–116.
- Anggraeni, R., Kadarso, Sumbodo, B. T., Munandar, W. A., & Ika, S. R. (2021). The Profitability of Sweet Potato Farming in Karanganyar Regency, Central Java. *IOP Conference Series: Earth and Environmental Science*, 662(1). <https://doi.org/10.1088/1755-1315/662/1/012007>
- Anggraini, R. S., Haryono, D., & Prasmatiwi, F. E. (2022). ANALISIS PRODUKSI DAN PENDAPATAN USAHATANI UBI KAYU DI KECAMATAN SEPUTIH BANYAK KABUPATEN LAMPUNG TENGAH. *Jurnal Ilmu-Ilmu Agribisnis*, 10(3), 341. <https://doi.org/10.23960/jiia.v10i3.6218>
- Donkor, E. A., Donkor, E., Owusu-Sekyere, E., & Owusu, V. (2020). The development and promotion of sweet potato yoghurt in ghana: Implications for sustainable production and consumption policies. *Sustainability (Switzerland)*, 12(8). <https://doi.org/10.3390/SU12083336>
- Efisiensi, A., Yang, F.-F., Usahatani, M., Jalar, U., Batatas, I., Kelompok, D., Tunas, T., Desa, R., Kecamatan, S., Kabupaten Majalengka, T., Widyastuti¹, K. A., & Umyati, S. (2023). Factors Affecting Sweet Potato (Ipomoea batatas L.) Farming In Sukaperna Village Talaga District Majalengka Regency. In *Journal Of Sustainable Agribusiness* (Vol. 02, Issue 01).
- El Yasin, M. S. W., & Pudjiastutik, E. W. (2019). ANALYSIS OF FARMING INCOME OF SWEET POTATO (Ipomea batatas L.) IN VILLAGE OF PANTI, SUB-DISTRICT PANTI, DISTRICT OF JEMBER. *Jurnal Agribest*, 3(2), 101. <https://doi.org/10.32528/agribest.v3i2.2325>
- Fauzan Maulana, E., Afifah, L., Studi Agribisnis, P., Pertanian Universitas Singaperbangsa Karawang Jl Ronggowaluyo, F. H., Timur, T., & Karawang, K. (n.d.). Analisis Ekonomi Usahatani Jagung (Zea Mays L.) (Studi Kasus: Desa Tamansari, Kecamatan Pangkalan, Kabupaten Karawang). *Jurnal Ilmiah Wahana Pendidikan*, 2022(12), 80–89. <https://doi.org/10.5281/zenodo.6943490>
- Fauzi Rio, Milllah, S., Rochdiani, D., & Qianti, S. R. (2024). Mimbar Agribisnis: Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisnis Analysis of Production Risk and Income of Sweet Potato Farming in Kuningan Regency. *Januari*, 11(1), 502–510.
- Gao, Y., Tang, Z., Xia, H., Sheng, M., Liu, M., Pan, S., Li, Z., & Liu, J. (2021). Potassium fertilization stimulates sucrose-to-starch conversion and root formation in sweet potato (Ipomoea batatas (L.) lam.). *International Journal of Molecular Sciences*, 22(9). <https://doi.org/10.3390/ijms22094826>
- Hamidah, E., Rahayu, E. S., Sutrisno, J., & Marwanti, S. (2021). Economic analysis of sweet potato (Ipomoea batata L.) farming in Lamongan regency. *IOP Conference Series: Earth and Environmental Science*, 637(1). <https://doi.org/10.1088/1755-1315/637/1/012016>
- Kakabouki, I., Togias, T., Folina, A. E., Karydogianni, S., Zisi, C., & Bilalis, D. (2020). Evaluation of yield and nitrogen utilisation with urease and nitrification inhibitors in sweet potato crop (Ipomoea batatas L.). *Folia Horticulturae*, 32(2), 147–157. <https://doi.org/10.2478/fhort-2020-0014>
- Listyora, F. N., Gunardi Judawinata, M., Rochdiani, D., Karyani, T., & Padjadjaran, U. (2023). KERAGAAN USAHATANI UBI JALAR (Ipomoea Batatas L.) (STUDI KASUS KELOMPOK TANI HURIP, DESA CIKARAWANG, KECAMATAN

- DRAMAGA, KABUPATEN BOGOR) Performance of Sweet Potato (*Ipomoea batatas* L.) Farming Management (Case Study of Hurip Farming Group, Cikarawang Village, Dramaga District, Bogor District). *Jurnal Agrimanex*, 3(2).
- Mokalu, K., Sondakh, M. F. L., & Mandei, J. R. (2022). *ANALISIS BIAYA DAN PENDAPATAN USAHATANI KENTANG DESA SINISIR KECAMATAN MODOINDING Costs and Income Analysis of Potato Farming in Sinisir Village, Modinding District* (Vol. 4).
- Nayan, G. Z., Takim, F. O., Aremu, C. O., & Okunola, A. A. (2020). Effect of maize sweet potato intercrop over sole cropping system on weed infestation. *IOP Conference Series: Earth and Environmental Science*, 445(1), 0–10. <https://doi.org/10.1088/1755-1315/445/1/012007>
- Rahmawati, N., Lahay, R. R., Irmansyah, T., & Mawarni, L. (2020). Yield and tuber quality of orange-fleshed sweet potato cultivars under drought stress in greenhouse. *IOP Conference Series: Earth and Environmental Science*, 454(1). <https://doi.org/10.1088/1755-1315/454/1/012159>
- Rizzolo, J. A., Woiciechowski, A. L., Júnior, A. I. M., Torres, L. A. Z., & Soccol, C. R. (2021). The potential of sweet potato biorefinery and development of alternative uses. *SN Applied Sciences*, 3(3), 1–9. <https://doi.org/10.1007/s42452-021-04369-y>
- Sapakhova, Z., Raissova, N., Daurov, D., Zhapar, K., Daurova, A., Zhigailov, A., Zhambakin, K., & Shamekova, M. (2023). Sweet Potato as a Key Crop for Food Security under the Conditions of Global Climate Change: A Review. In *Plants* (Vol. 12, Issue 13). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/plants12132516>
- Sulistiani, R., Rosmayati, Siregar, L. A. M., & Harahap, F. (2020). The Effects of Temperature and Potassium Fertilizer on the Growth, Yield, and Biochemical Parameters of *Ipomoea batatas* var. Antin-1. *Acta Agrobotanica*, 73(3), 1–10. <https://doi.org/10.5586/aa.7337>
- Ulfa, G. M., Putri, W. D. R., Fibrianto, K., Prihatiningtyas, R., & Widjanarko, S. B. (2020). The influence of temperature in swelling power, solubility, and water binding capacity of pregelatinised sweet potato starch. *IOP Conference Series: Earth and Environmental Science*, 475(1). <https://doi.org/10.1088/1755-1315/475/1/012036>