



---

**COMPARATIVE ANALYSIS OF CORN FARMING INCOME BETWEEN  
GOOD AGRICULTURAL PRACTICE AND CONVENTIONAL SYSTEMS IN  
TILONGKABILA DISTRICT, BONE BOLANGO REGENCY**

**Ramlan Mustafa<sup>1</sup>**

**Universitas Negeri Gorontalo, Gorontalo, Indonesia**

[ramlan@ung.ac.id](mailto:ramlan@ung.ac.id)

**Adeliyan A. Husain<sup>2</sup>**

**Universitas Negeri Gorontalo, Gorontalo, Indonesia**

[adeliahusain125@gmail.com](mailto:adeliahusain125@gmail.com)

**Zulham Sirajuddin<sup>3</sup>**

**Universitas Negeri Gorontalo, Gorontalo, Indonesia**

[zulham@ung.ac.id](mailto:zulham@ung.ac.id)

---

**Abstract**

This study aims to: increase corn farming income using the Good Agricultural Practices system with conventional in Tilongkabila District, Bone Bolango Regency, and analyze the income comparison between the Good Agricultural Practices system and conventional in corn farming in Tilongkabila District, Bone Bolango Regency. This research was conducted in October-January 2025. The research method used a survey method, and the questionnaire, as a research tool, was an income analysis and a Mann-Whitney independent test analysis. The results of this study indicate that the total income of corn farmers using the Good Agricultural Practices system is Rp. 168,615,622 with an average income cost of Rp. 6,245,023/farmer or Rp. 4,783,422/Ha, and the total income for corn farmers using the conventional system is Rp. 82,676,066 with an average income cost of Rp. 3,592,612/farmer or Rp. 2,850,899/Ha; and the results of the Mann-Whitney Independent Sample Test analysis, there is a significant difference between the income of farmers who use the Good Agricultural Practices system and the conventional system in Tilongkabila District, Bone Bolango Regency.

**Keywords:** Farming Income, Good Agricultural Practice, Conventional



## INTRODUCTION

In Indonesia, the majority of state revenue comes from the agricultural sector. A potential market for domestic commodities, including consumer and manufactured goods, particularly those produced by the food crop subsector, is agriculture. Among the most widely cultivated agribusiness crops in Indonesia and globally is corn. Specifically, corn is a food crop that is highly beneficial for human and animal health (Salelua & Maryam, 2018:48) . Furthermore, corn can increase farmer income, increase the availability of production inputs, and enhance farmers' knowledge and skills in farming (Boekoesoe & Mustafa, 2023:49).

One of the factors taken into account in determining how much effort farmers put into corn cultivation is planting activities. The level of application of corn farming cultivation is based on the application of seed planting, plant spacing and many more (Rahmadanti, et al ., 2022:98) . There are two applications carried out on corn plants with the same goal of increasing the quality and quantity of crop production, namely: The application of the conventional system is a system that farmers commonly use, but conventional processing has a negative impact on the agricultural environment if carried out in the long term (Rahmadanti, et al ., 2022:94) . In contrast to the conventional system, the application of the GAP ( Good Agricultural Practice) system aims to increase the superiority and productivity of corn plants because the process of seed selection, cultivation, harvesting and post-harvesting are all taken into account in their order ( Fernandez, et al ., 2024:2996) .

Gorontalo Province is renowned for its exceptional corn production. Although Gorontalo is one of Indonesia's leading corn-producing regions, its yield remains relatively low. According to data from the Gorontalo Province Statistics Agency (BPS), corn production increased in 2021 and 2022, but decreased in 2023, reaching 531,780.13 tons.

Considering the vast amount of land and the large number of farmers in Gorontalo Province, corn farming is one of the promising farming businesses to increase household income and reduce poverty and is the farming business that is mostly carried out by farmers in Gorontalo Province (Murtisari, *et al .*, 2024:96) . Bone Bolango Regency is a regency that has a very large area and has several sub-districts, including Tilongkabila District. The economy in Tilongkabila District is supported by the agricultural sector. Agriculture is the backbone of the community's economy, with the production of various types of food crops, including rice and corn.



Some of the problems faced by Gorontalo Province include its very high corn production, but its productivity is lower than the national average. Gorontalo's corn productivity is still below the national average and is therefore considered low. Currently, Gorontalo Province's corn production is only 46.82 tons (BPS Indonesia, 2023), compared to the national average of 58.14 tons (BPS Indonesia, 2023).

To assess this productivity, it is necessary to calculate the income of corn farming using the GAP and conventional systems in the sub-district. Farmers generally perform economic calculations, but not the various levels of income. Based on the above, There are two problem formulations found in the field, namely, first, what is the income between corn farming using the Good Agricultural Practice system and conventional farming in Tilongkabila District, Bone Bolango Regency and second, is there a difference in income between the Good Agricultural Practice system and conventional farming in corn farming in Tilongkabila District, Bone Bolango Regency.

## LITERATURE REVIEW

Good Agricultural Practice is also a set of guidelines for producing crops and livestock safely and sustainably. Its goal is to help farm owners optimize business operations and yields while reducing production costs and environmental impact. Following sustainable agricultural principles makes it easier for producers to provide products with the quality retailers need and consumer's desire. Good Agricultural Practice ( GAP) encompasses everything from planting to post-harvest processing to produce fresh fruit and vegetable products that are competitive, safe for consumption, high-quality, sustainable, and environmentally friendly (Fauziah, 2019:91) .

Conventional systems are the customary farming methods or practices practiced by farmers from ancient times to the present day, used in various places before the advent of modern technology. Communities have their own opinions on how to prepare land, equipment, animals, and so on. Groups that carry out agricultural tasks and farmers who raise and herd livestock will form as a result of this farming experience. ( Darwis 2017:11) .

Agricultural science is the study of how farmers plan to use elements that produce output to achieve specific goals so that their businesses can provide high profits that can be obtained by farmers. (Simatupang, et al, 2021:39) . Agriculture is a term used to describe the management of production facilities and technology in the agricultural industry. This can be interpreted broadly and specifically in



the agricultural context. Small-scale commercial agricultural activities, such as growing rice, planting corn, raising chickens, and so on, are generally referred to as agriculture. However, narrowly, it is a large company that manages extensive land and a large amount of capital, including plantations, livestock, and fisheries (Mantali, et al ., 2021:83).

## RESEARCH METHOD

This research was conducted in Tilongkabila District, Bone Bolango Regency and took place from October to January 2025. The location of this research was determined because in Tilongkabila District, there are already several farmers who have implemented the Good Agricultural Practice system and there has never been a similar study, especially regarding the comparison of corn farmers using the Good Agricultural Practice and conventional systems.

In this study, the author used a quantitative survey method. According to Maidiana (2021:29), survey research is a research method that collects information from a sample by asking questions through questionnaires or *interviews* to discover relative events, distributions, and relationships between variables and various aspects of the population, using questionnaires as a data collection tool.

The types of data sources used in this study are primary and secondary data. Primary data is data obtained from research results used directly by researchers in the field through direct observation and interviews with corn farmer respondents. These data sources include interviews, surveys, questionnaires, and direct observation. Secondary data is data obtained from other sources such as related agencies, for example, the Central Statistics Agency (BPS), libraries, relevant references, journals, theses, and so on.

The population used in this study was 50 corn farmers in Tilongkabila District, Bone Bolango Regency, including those using *Good Agricultural Practices* (GAP) and conventional methods. The sampling technique used was a *total sampling* or census method, where the sample was determined from the entire population.

The data collection techniques used in this study were interviews & questionnaires, observation, and documentation.

Data analysis used production costs, farm revenue, and farm income, and a comparison test . To compare corn crops using the *Good Agricultural Practices* (GAP) system and conventional corn crops, an *independent t-test* was used. The entire data analysis process was conducted using SPSS.



1. Production costs are the total amount of costs incurred by farmers during the production process, which is the result of adding fixed costs and variable costs (Killay, *et al.*, 2023:26715) .

$$TF = TC + VC$$

Where:

TF = Total Cost

TFC = Total Fixed Cost

TVC = Total Variable Cost (total variable costs)

2. Farm Business Income is the result of multiplying the production obtained by the selling price received. Gross income or revenue can be defined as the total value of production within a certain period, whether marketed or not (Aruan, 2023:25) .

$$TR = PXQ$$

Where:

TR = Total Revenue (total income)

P = Total Price

Q = Production obtained in farming

3. Farm income is the difference between revenue and all farm expenses. The size of this income can be determined by the success of the farming activities undertaken, providing information on revenue and expenses that can be calculated over a specific period (Aruan, 2023:26).

$$I = TR - TC$$

Where:

I = Income

TR = Total Revenue (total income)

TC = Total Cost

4. The t-test used is the *Independent Samples (Mann Whitney) test*. *Independent Samples (Mann Whitney) Test* is a method used to compare two groups of means from two different samples (*independent*). This procedure is called the *Mann-Whitney test* as follows: Basic concept
  - a. The purpose of the *Mann Whitney Test* is to determine whether the means of two unpaired samples are equal.
  - b. *The Mann Whitney test* is a non-parametric statistical component, the number of samples used does not have to be the same.



- c. Homogeneous and normally distributed research data are not required for the *Mann Whitney test* .
- d. If the data is not normally distributed, the *Mann Whitney test* is used instead of the independent sample t-test.

*Mann Whitney’s* decision-making basis

- a. If the Asymp. Sig value < 0.10, then the hypothesis is accepted.
- b. If the Asymp.Sig value > 0.10, then the hypothesis is rejected.

## RESULTS AND DISCUSSION

### Fixed Cost

Fixed costs *are* costs whose size does not depend directly on the size of the production produced and are not used up in one production process in one planting season. Fixed costs consist of depreciation, taxes, and capital interest (Apriani, *et al.*, 2017:146) . The following table details the use of fixed costs in corn farming using *the Good Agricultural Practice* and conventional systems in Tilongkabila District, Bone Bolango Regency.

**Table 1.**

**Fixed Costs of Corn Farming Between Good Agricultural Practices and Conventional Systems in Tilongkabila District, Bone Bolango Regency, 2025**

No	Production cost	GAP System	Conventional System
		Value (Rp)	Value (Rp)
1.	Land Tax	1,410,000	1,160,000
2.	Equipment Depreciation	1,727,869	852,854
3.	Labor in the Family	13,622,857	4,640,000
	<b>Amount</b>	<b>16,750,727</b>	<b>6,652,854</b>
	<b>Average/Farmer</b>	<b>620,768</b>	<b>289,255</b>
	<b>Average/Ha</b>	<b>475,482</b>	<b>252,899</b>

Source: Processed Data, 2025

This shows that the total fixed costs of corn farming on land taxes, depreciation of equipment, and labor in the family on corn crops in Tilongkabila District, Bone Bolango Regency, which uses the Good Agricultural Practice system, is with a total value of Rp. 16,760,000 with an average cost of Rp. 620,768 per farmer and Rp. 475,482 per Ha. While farmers who use the conventional system are with a total value of Rp. 6,652,854 with an average cost of Rp. 289,255



per farmer and Rp. 252,899 per Ha. So it can be seen that there is a comparison of fixed costs between corn farmers who use the Good Agricultural Practice system and conventional.

**Variable Cost**

Variable costs are costs whose size is greatly influenced by the size of production and are only in one production process, which consists of the number of seeds, the amount of fertilizer, the amount of pesticide, and labor (Apriani, et al., 2017:147). The following table details the use of variable costs in corn farming using the Good Agricultural Practice and conventional systems in Tilongkabila District, Bone Bolango Regency.

**Table 2.**

**Variable Costs of Corn Farming Between Good Agricultural Practices and Conventional Systems in Tilongkabila District, Bone Bolango Regency, 2025**

No	Production cost	GAP System	Conventional System
		Value (Rp)	Value (Rp)
1.	Seed	40,600,000	19,500,000
2.	Fertilizer	35,190,000	22,855,000
3.	Pesticide	4,275,000	3,780,000
4.	Labor in the Family	94,564,000	36,643,250
5.	Piping Tool Rental	19,840,000	8,794,000
6.	Means of transportation	9,920,000	4,397,000
	<b>Amount</b>	<b>204,389,000</b>	<b>95,999,250</b>
	<b>Average/Farmer</b>	<b>7,569,963</b>	<b>4,173,880</b>
	<b>Average/Ha</b>	<b>5,798,270</b>	<b>3,310,319</b>

Source: Processed Data, 2025

This shows that the total variable costs of corn farming on seeds, fertilizers, pesticides, labor outside the family, rental of shellers, and transportation of corn crops in Tilongkabila District, Bone Bolango Regency, which uses the *Good Agricultural Practice system*, are Rp. 204,389,000. with an average cost of Rp. 7,569,963. per farmer and Rp. 5,798,270. per Ha. While those using the conventional system have a total value of Rp. 95,999,250 with an average cost of Rp. 4,173,880 per farmer and Rp. 3,310,319 per Ha. So it can be seen that there is a comparison of variable costs between corn farmers who use the *Good Agricultural Practice system* and conventional.



**Total Cost**

Total cost is the sum of all costs incurred in a single production process, including both variable and fixed costs. Total cost is also the result of adding fixed and variable costs (Suryani, et al ., 2021:296 ) . The following table details the use of total costs incurred in corn farming using the Good Agricultural Practice and conventional systems in Tilongkabila District, Bone Bolango Regency.

**Table 3.**

**Total Cost of Corn Farming Between Good Agricultural Practices and Conventional Systems in Tilongkabila District, Bone Bolango Regency, 2025**

No	Production cost	GAP System	Conventional System
		Value (Rp)	Value (Rp)
1.	Fixed Costs	16,760,727	6,652,854
2.	Variable Costs	204,389,000	95,999,250
	<b>Amount</b>	<b>221,149,727</b>	<b>102,652,104</b>
	<b>Average/Farmer</b>	<b>8,190,731</b>	<b>4,463,135</b>
	<b>Average/Ha</b>	<b>6,273,751</b>	<b>3,539,728</b>

Source: Processed Data, 2025

Table 3 above explains the comparison of farmer farming using the Good Agricultural Practice system and the conventional system in Tilongkabila District. It can be stated that the average total cost of corn farming using the Good Agricultural Practice system is Rp. 221,149,727. with an average value per farmer of Rp. 8,190,731 and an average per hectare of Rp. 6,273,751. Meanwhile, for conventional corn farmers with a total cost of Rp. 102,652,104 with an average value per farmer of Rp. 4,463,135 and an average per hectare of Rp. 3,539,728. It can be seen that the total costs incurred by farmers using the Good Agricultural Practice system are greater than the total costs incurred by farmers using the conventional system.

**Corn Farming Income and Revenue**

The income earned by farmers from growing corn is the income received by farmers minus production costs. Farming costs are expenses incurred in every process of corn cultivation, from land preparation to post-harvest, and revenue is the production yield multiplied by the price of corn (Tambio, et al., 2020:26) . The following table details the income and revenue from production and productivity in corn farming using the Good Agricultural Practice and conventional systems in Tilongkabila District, Bone Bolango Regency.



**Table 4.**  
**Income and Productivity of Corn Farming Between Good Agricultural Practices and Conventional Systems in Tilongkabila District, Bone Bolango Regency, 2025**

No	Production cost	GAP System	Conventional System
		Value (Rp)	Value (Rp)
1.	Reception	354,738,636	171,990,000
2.	Total Cost	186,123,014	89,313,934
<b>Total Revenue</b>		<b>168,615,622</b>	<b>82,676,066</b>
<b>Average/Farmer</b>		<b>6,245,023</b>	<b>3,594,612</b>
<b>Average/Ha</b>		<b>4,783,422</b>	<b>2,850,899</b>

Source: Processed Data, 2025

Table 4 shows the average total income of farmers who grow corn using the Good Agricultural Practice system and the conventional system in Tilongkabila District, Bone Bolango Regency, which is obtained from the difference between revenue minus total costs. The total value of the income of farmers who grow corn using the Good Agricultural Practice system is Rp. 168,615,622. with an average per farmer of Rp. 6,245,023. and an average per hectare of Rp. 4,783,422. Meanwhile, the total value of the total income of farmers who grow corn using the conventional system is Rp. 82,676,066 with an average per farmer of Rp. 3,592,612 and an average per hectare of Rp. 2,850,899.

**Comparison of Income in Two Different Groups**

The Independent Mann-Whitney statistical analysis tool to determine the comparison of costs, revenues, and incomes in two groups of corn farmers in Tilongkabila District, Bone Bolango Regency.

**Table 5.**  
**Results of Comparative Analysis of Income in Two Different Groups of Two-Sample Independent Test (Mann-Whitney Test)**

Component	n	$\alpha$	sig
Cost			
- GAP	27	31.00	0.00
- Conventional	23	19.04	
Reception			
- GAP	27	30.00	0.01



- Conventional	23	20.22	
Income			
- GAP	27	28.81	0.08
- Conventional	23	21.61	

Source: Processed SPSS Data, 2025

The results of statistical tests using the Mann-Whitney test showed that there were significant differences at the alpha level of 0.10, namely in production costs, revenues, and income in corn farming using the Good Agricultural Practice system and those using the conventional system. The average cost using the Good Agricultural Practice system was 31.00 while the average value using the conventional system was 19.04. The average revenue using the Good Agricultural Practice system was 30.00 while the average value using the conventional system was 20.22. And in corn farming income with an average value using the Good Agricultural Practice system was 28.81 while the average value using the conventional system was 21.61. So it can be said that the costs, revenues, and income using the Good Agricultural Practice system were statistically higher than those using the conventional system. The costs, revenues, and income had values at the alpha level of 0.10, which means there were differences between farmers who applied the Good Agricultural Practice system and farmers who used the conventional system and it can be interpreted that the two implementation systems produced different incomes.

This shows that there are differences influenced by the size of the production results from farming, where farming that uses the Good Agricultural Practice system has a slightly higher total production yield compared to farming that uses conventional, as well as the average total costs, revenues and income of farmers who apply the Good Agricultural Practice system are higher compared to farmers who do not apply the Good Agricultural Practice system . This shows that factors that support the success of a farming business, one of which is the cultivation process, the right cultivation techniques, starting from land clearing, planting, fertilizing, maintenance, harvesting and post-harvest handling (Lubis and Lontoh, 2016:145). This is supported by research by Nahraeni et al., ( 2020:51) which states that the application of Good Agricultural Practices (GAP) is a key strategy to increase agricultural production and productivity.



## CONCLUSION

Based on the calculation results for corn farmers who use the Good Agricultural Practice system with a total income of Rp. 168,615,622. with an average per farmer of Rp. 6,245,023. and an average per hectare of Rp. 4,783,422. While the conventional system the total income is Rp. 82,676,066 with an average per farmer of Rp. 3,592,612 and an average per hectare of Rp. 2,850,899. and analysis of the Independent sample Mann-Whitney test on income is 0.08 which means it is greater than the value of  $\alpha = 0.10$  ( $0.08 < 0.10$ ), then it can be concluded that the hypothesis is accepted which means there is a significant difference between the income of farmers who use the Good Agricultural Practice system compared to the income of farmers who use the conventional system.

## REFERENCES

- Apriani, AE, Soetoro, S., & Yusuf, MN (2017). Analysis of Corn Farming (*Zea Mays L*). *Agroinfo Galuh Student Scientific Journal* , 2 (3), 145. <https://doi.org/10.25157/jimag.v2i3.277>
- Aruan, SP (2023). *Analysis of Corn (Zea mays L) Farming Income in Dry Land in Tano Tinggir Village, Purba District, Simalungun Regency* (Doctoral dissertation, Medan Area University).
- Central Bureau of Statistics of Indonesia. (November 15, 2023). *Harvested Area, Production, and Productivity of Corn by Province* .
- Statistics Indonesia. (October 16, 2023). *Harvested Area and Corn Production in Indonesia 2023 (Preliminary Figures)* .
- Boekoesoe, Y., & Mustafa, R. (2023). Institutional Strengthening of Corn Farmer Groups Assisted by Read-SI. *Journal of Agricultural Technology Community Service* , 1 , 46-50.
- Darwis, K., (2017). *Agricultural Science: Theory and Application* (Vol. 1). Published by CV. Inti Mediatama.
- Fauziah. (2019). Analysis of the Application of Good Agricultural Practice (GAP) Principles for Sustainable Agriculture in Mustard Greens Farming in Landasan Ulin Utara Village, Liang Anggang District, Banjarbaru. *Agribisnis* , Vol 3 (3), 10.
- Fernandez, R., Wulandari, S., Hasri Windari, E., Coffee Science Study, P., Agriculture, F., Pat Petulai, U., ... Bengkulu, U. (2024). Level of Adoption of Good Agriculture Practices (Gap) of Coffee Plants by Tunas Jaya and Bima Saktal Farmer Groups in Iv Suku Menanti Village, Rejang Lebong Regency. *Community Development Journal* , 5 (2), 2995–3001.
- Isbahi, M. B., Zuana, M. M. M. , & Mariana, E. R. . (2022). The Technology



- Strategy in Website Communication Media in Improving Business Activities. *Majapahit Journal of Islamic Finance and Management*, 1(2), 126–138. <https://doi.org/10.31538/mjifm.v1i2.17>
- Isbahi, M. B., Zuana, M. M. M., & Toha, M. (2024). The Multi-Social Relation of the Cattle Industry in the Plaosan Subdistrict Animal Market of Magetan Regency. *Malacca: Journal of Management and Business Development*, 1(1), 31–46. <https://doi.org/10.69965/malacca.v1i1.51>
- Lubis, RE, & Lontoh, AP (2016). Management of oil palm (*Elaeis guineensis* Jacq.) harvest in Adolina Plantation, Serdang Bedagai, North Sumatra. *Agrohorti Bulletin*, 4 (2), 144-154.
- Maidiana, M. (2021). Survey research. *ALACRITY: Journal of Education*, 20-29.
- Mantali, MA, Rauf, A., & Saleh, Y. (2021). The Role of Farmer Groups in Increasing Paddy Farming Productivity (Case Study of Farmer Groups in Bongopini Village). *Agristan Journal*, 5 (2), 85.
- Murtisari, A., Fitri, IA, & Kurnia, TD (2024). The Diversity Livelihood Of Corn Farmer Households: Evidence From Transmigration Program Of Gorontalo Province, Indonesia. *Agric*, 36 (1), 95-112.
- Nahraeni, W., Masitoh, S., Rahayu, A., & Awaliah, L. (2020). Application of good agricultural practices (GAP) for pomelo (*Citrus maxima* (Burm.) Merr.). *Jurnal Agribisains*, 6 (1), 50-59.
- Killay, T., Litualy, JW, & Sitanala, TF (2023). Analysis of Production Costs in Corn Farming and Sustainability on Moa Island. *Tambusai Education Journal*, 7 (3), 26711-26718.
- Rahmadanti, R., Nurmayasari, I., & Ibnu, M. (2022). Implementation of Pre-Planting, Planting and Post-Planting Activities in Healthy Rice Farming Cultivation in Rejo Asri Village, Seputih Raman District.
- Salelua, SA, & Maryam, S. (2018). Potential and Prospect of Corn Production Development (*Zea Mays* L.) in Samarinda City. *Journal of Agribusiness and Agricultural Communication*, 1 (1), 47.
- Suryani, FD, Boedirochminarni, A., & Arifin, Z. (2021). Income Analysis of the Sticky Rice Peuyeum Home Industry in Tarikolot Village, Cibeureum District, Kuningan Regency, West Java Province. *JIE Journal of Economics*, 5 (2), 294-301.
- Tambio, F., Baruwadi, MH, & Halid, A. (2020). Analysis of Income of Corn Farmers in Potanga Village, Botumoito District, Boalemo Regency. *Agrinesia: Scientific Journal*, 5 (1), 1–7. Retrieved from <https://Ejurnal.Ung.Ac.Id/Index.Php/Agr/Article/View/11813>
- Toha, M., Zuana, M. M. M., & Isbahi, M. B. (2024). Acculturation of Mataraman



Local Wisdom with Islamic Values: Implications for Social and Economic Development. *Danadyaksa: Post Modern Economy Journal*, 2(1), 33–47. <https://doi.org/10.69965/danadyaksa.v2i1.143>

Zamroni, M. A., Toha, M., Zuana, M. M. M., & Baiqun Isbahi, M. (2023). Exploring Zakat Distribution Via Blockchain in Indonesia Perspective of Masalah Mursalah Wahbah Zuhaili. *Indonesian Interdisciplinary Journal of Sharia Economics (IJSE)*, 6(3), 3544-3555. <https://doi.org/10.31538/ijse.v7i3.5821>