Agribusiness Journal
https://usnsj.id/index.php/AJ
journalagribusiness@gmail.com
e-ISSN : 2548-2211, p-ISSN: 2548-379X

DOI : https://doi.org/10.31327/aj.v7i2.2323

Comparative Analysis of Rice Planting Systems Against Climate Change

Nina Maksimiliana Ginting, David O Simatupang , Silas Tanggu Redu, Abdul Rizal
Department of Agribusiness, Faculty of Agriculture, Musamus University, Indonesia
*Correspondence email: ginting_agribisnis@unmus.ac.id

Abstract

This research aims to look at the comparison of rice planting systems and the comparative efficiency of rice planting systems in the Tanah Miring District against climate change. The research was conducted in Yabamaru Village, Isanombias Village Sumber Harapan Village, Tanah Miring District, Merauke Regency. This location was chosen purposively with the consideration that these three villages are the villages with the largest harvest area and number of rice farmers in the Tanah Miring District. The total population is 1814 farmers and the sample is 181 farmers. Data analysis method with the concept of comparative testing. Analysis of different tests on the revenue and income of the Tapin and Tabela rice planting systems with revenue sig 0.004 and revenue sig 0.038. These results show differences in revenue and income between the two planting systems with Tapin revenue being IDR 21,801,758.24 and Tabela revenue being IDR 20,003,133.33. Tapin's income is IDR 20,003,133.33 and Tabela's income is IDR 9,444,116.67 per planting season. Climate change also greatly influences the planting of Tapin and Tabela, where factors influencing climate change include farmers' lack of knowledge of climate change, changes in planting periods, and extreme weather and pest attacks.

Keywords: Comparison, paddy, tapin, tabela

A. Introduction

Climate change can affect economic growth, especially in the agricultural sector. Climate change causes conditions where there is a shift in the seasons so that it is difficult for farmers to determine the planting season, and harvest period and high fluctuations in temperature and humidity which results in the growth and development of crop pest organisms (OPT) increasing. (Sun et al., 2023). The influence of climate in agriculture is multidimensional ranging from resources, agricultural infrastructure, and agricultural production systems, to aspects of food security and independence, as well as the welfare of farmers and the community in general (IAARD, 2011). Climate causes vulnerability to farmer households, and damage to agricultural land resulting in crop failure and decreased production. Crop failure affects the economy of farmer households that only rely on agricultural products for their livelihood (Titis Pury Purboningtyas et al., 2019).

In Indonesia, the agricultural sector contributed 13.02% to the national GDP during the period 2019-2022. Where the number of farmer households is 27,368,975 households and the majority are engaged in the food crop subsector as many as 15,550,786 households. (BPS,

2023). Farmers hold an important role in climate change so that they can adapt to conditions so that farmer households can maintain their livelihoods (Titis Pury Purboningtyas et al., 2019).

Merauke Regency is a regency in South Papua Province which is located at the eastern tip of Indonesia and borders the State of Papua New Guinea and the largest producer of rice crops in Papua Province. In 2023, the rice harvest area will be 49,573.50 (ha), and rice production will be 236,500.33 (tons) with rice productivity of 4.77 tons/ha, so the government is promoting the "National Rice Barn" program in Merauke Regency (BPS Merauke, 2023). Based on the records of the Indonesian Meteorology, Climatology, and Geophysics Agency (BMKG) in 2023, Merauke Regency has ideal air temperature, humidity, wind speed, air pressure and rainfall for agriculture, so that some land in Merauke is very productive to be used as agricultural land. Based on its geographical location, Merauke Regency is located at the eastern tip of the southern part of Indonesia, directly bordering the countries of Papua New Guinea and Australia.

Table 1. Planting Area, Harvest Area, Rice Production and Productivity in the Regency Merauke

No	District	Planting Area (Ha)	Harvest Area (Ha)	Production (Tons)	Productivity (Tons/ Ha)	Planting Area (Ha)	Harvest Area (Ha)	Production (Tons)	Productivity (Tons/Ha)
		2022				2023			
1	Kimam	160,00	160,00	560,00	3,50	64,75	64,75	234,40	3,62
2	Tabonji	77,25	77,25	239,48	3,10	39,50	36,50	152,08	3,85
3	Waan	89,00	89,00	226,95	3,55	19,75	19,75	82,16	4,16
4	Ilwayab	45,00	45,00	119,25	2,65	-	-	-	-
5	Okaba	11,00	11,00	350,30	3,10	124,50	124,50	404,63	3,25
6	Tubang	8,00	8,00	20,00	2,50	-	-	-	-
7	Nguti	-	-	-	-	-	-	-	-
8	Kaptel	1,00	1,00	2,50	2,50	1,50	1,50	-	-
9	Kurik	17.424	17.335,00	77.660,80	4,48	15.584,00	15.375,00	87.483,75	5,69
10	Animha	38,50	38,50	139,37	3,62	35,00	35,00	84,00	2,40
11	Malind	9.917,50	9.285,00	35.747,25	3,85	9.484,00	9.374,00	42.183,00	4,50
12	Merauke	1.180,75	1.170,75	4.870,32	4,16	746,00	731,00	3.618,45	4,95
13	Naukenjerai	490,00	490,00	1.666,00	3,40	185,00	185,00	416,25	2,25
14	Tanah Miring	8.847,00	8.711,00	28.310,75	3,25	8.652,00	8.182,00	34.650,77	4,24
15	**Tanah Miring**	**16.116,00**	**15.921,00**	**64.639,26**	**4,06**	**14.954,00**	**14.552,00**	**64.392,60**	**4,43**
16	Jagebob	752,75	752,75	3.048,64	4,05	764,50	764,50	2.369,95	3,10
17	Sota	1,00	1,00	3,10	4,10	2,00	2,00	2,30	1,15
18	Muting	57,00	57,00	190,95	3,35	30,00	30,00	100,50	3,35
19	Eligobel	134,00	134,00	469,00	3,50	56,50	56,50	197,75	3,50
20	Ulilin	223,00	223,00	780,50	3,50	36,50	36,50	127,75	3,50
	Total	**55.674,75**	**54.612,25**	**219.044,42**	**4,01**	**50.779,50**	**49.573,50**	**236.500,33**	**4,77**

Source: Central Statistics Agency 2023

Merauke Regency consists of 20 districts, namely Kimam, Tabonji, Waan, Iiwayab, Okaba, Tubang, Nguti, Kaptel, Kurik, Animha, Malind, Merauke, Naukenjerai, Tanah Miring, Tanah Miring, Jagebob, Sota, Muting, Eligobel, and Ulilin. Based on BPS data, rice production in Merauke Regency in 2022 and 2023 has increased, but the planting area and harvest area have decreased. This occurs due to climate change so there is a shift in planting time.

Table 2. Rice Planting Area in Tanah Tilting District in 2021-2022

No	Village	Planting Area/Ha 2021	Planting Area/2022
1	Yasa Mulya	725	725
2	Sumber Harapan	2.364	2.364
3	Waninggap Say	1.400	1.400
4	Waninggap Miraf	1.184	1.184
5	Inasom Mbias	2.650	2.650
6	Hidup Baru	770	770
7	Amunkay	1.843	1.843
8	Yaba Maru	2.700	2.700
9	Tambat	75	75

10	Sarmayam Indah	1.340	1.340
11	Ngutibob	1.800	1.800
12	Senayu	185	185
13	Bersehati	806	806
14	Sarsang	60	60
15	Kemangi	105	105

Source: BPP Tanah Miring District 2022

Tanah Miring District is one of the districts in Merauke Regency which is the second largest rice producer. Tanah Miring District consists of 15 villages, namely Yasa Mulya Village, Sumber Harapan, Waninggap Say, Waninggap Miraf, Inasom Mbias, Hidup Baru, Amunkay, Yaba Maru, Tambat, Sarmayam Indah, Ngutibob, Senayu, Bersehati, Sarsang and Kemangi. Increasing rice production and productivity can be done by improving cultivation technology through planting methods. The planting method is carried out to avoid climate change that occurs. The planting system arrangement is widely used by farmers, especially farmers in the Tanah Miring District. Farmers use the direct seed planting system (TABELA) and the transfer planting system (TAPIN). Direct seed planting system (TABELA) is a way of planting seeds by directly scattering seeds that have been prepared without sowing first and the transfer planting system (TAPIN) is farming by sowing first (Laguna, 2019).

Villages in Tanah Miring District carry out their farming with the two planting systems which have their weaknesses and advantages. The planting method carried out will affect rice production, the use of production facilities, pest and disease attacks, climate change and the efficiency of the time carried out. So production and quality will affect the selling price. Thus it needs to be analyzed **Comparison of Rice Planting Systems in Tanah Tilt District Against Climate Change.** Thus, the results of better planting methods used by farmers against climate change that occur and that will have an impact on the welfare of farmers are obtained.

B. Method

The research was conducted in Tanah Miring District, Merauke Regency. This location was chosen deliberately *(purposive)* with the consideration that Tanah Miring District is one of the rice centres in Merauke Regency. This research was conducted in 2024. The data used in the study consisted of: (a) Primary data, namely data obtained from questionnaires and direct interviews with respondents, namely rice farmers, (b) Secondary data is data obtained from related agencies such as BPS Merauke, agricultural extension workers and the Agriculture Office.

The stages in the collection of data for this research are carried out by:

1. Observation. Observation was carried out by going to the field directly to see rice farming activities carried out by farmers. This activity aims to further support the proof of existing data in interview techniques and questionnaire filling.
2. Interview. Sugiyono 2012, wrote that the interview technique is used when the researcher conducts a preliminary study to find the problem that must be researched, and also if the researcher wants to know more in-depth things from the respondents and the number of respondents is small or small.
3. Questionnaire. Sugiyono, 2015 questionnaire is a data collection technique using a list of written questions intended to deepen research data and information.

Population is an area of generality consisting of: objects/subjects that have certain qualities and characteristics that are determined by the researcher to be studied and then concluded. Population is not just the number of subjects/objects studied but includes all the characteristics or traits that the subject or object has. (Sugiono 2015). The population in this study is all rice farmers in Yabamaru Village, Isanombias Village and Sumber Harapan Village, Tanah Miring District, Merauke Regency which are the 3 villages with the largest production. Total Population: 1,814 farmers.

The sample is part of the number and characteristics that the population has. The purpose of determining the sample is to obtain information about the object of research by observing only a part of the population, an editorial of the number of research objects. Another purpose of sampling is to pinpoint the general characteristics of the population and to draw generalizations from the results of the study. So what is meant by the sample is the representative who has been selected to represent the population. This sample is a reflection of the population whose traits will be measured and representative of the existing population. With this sample, the research process will be easier and simpler. According to Suharsimi Arikunto, if the subjects are less than 100, it is better to take all of them so that the research is a population study. But if the number is more than 100 or in large quantities then 10-20% can be taken. Considering that in this study the population is more than 100 rice farmers, the number of samples is set at 10%, which is 1814 x 10% = 181 people/rice farmer.

Comparative Analysis of Production and Farm Income. The comparison of rice planting patterns was analyzed by the Independent Sample 2 Test (Sugiono, 2015). The formulation is as follows:

$$z = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)_0}{\sqrt{\sigma_1^2 / n_1 + \sigma_2^2 / n_2}}$$

Where:

$\bar{x}_1$ = average sample kel. 1 n_1 = Number of samples Kel. 1

$\bar{x}_2$ = average sample kel. 2 n_2 = number of samples kel. 2

S1 = standard deviation of Kel. 1; sp = combined s_1 & S2

S2 = Standard deviation of the sample kel. 2

C. Results and Discussion

Characteristics of Respondents Based on Farmer's Age. Table 3 is data that illustrates the variation in the age or age of the respondents in this study.

Table 3. Characteristics of Respondents Based on Farmer's Age

No.	Characteristic	Direct Seed (Tabela)		Planting Moves (Tapin)	
	Age	Total	Percentage (%)	Total	Percentage (%)
1	20-30	45	50	44	48,35
2	31-40	30	33,33	31	34,07
3	41-50	11	12,22	12	13,18
4	≥50	4	4,44	4	4,40
Total		90	100,00	91	100,00

Source: primary data processing results, 2024

Table 3 explains that the age of farmers is grouped into four different age categories, namely 20 to 30 years, 31 to 40 years, 41 to 50 years, and above 50 years. The results of the study showed that the age of farmers who used the Tabela system, namely 20-30 years a year, amounted to 45 respondents (50%), aged 31-40 years amounted to 30 respondents (33.33%), aged 41-50 years amounted to 11 respondents (12.22%), and aged >50 years amounted to 4 respondents (4.44%). As for farmers who use the Tapin system, there are 44 respondents (48.35%) aged 20-30, 34.07% (34.07%), 41-50 years old (12 respondents (13.18%), and >50 years old 4 respondents (4.40%). From the data presented, it can be seen that the majority of farmers in Tanah Miring District are in the age range of 20 to 30 years. The age of respondents has a significant impact on their physical capacity, mindset, and approach to managing agricultural businesses, especially when making important decisions. Younger farmers tend to have higher work productivity. In addition, they are generally more open and quick in absorbing and implementing technological innovations in their agricultural practices (Gunawan et al., 2022). This shows that rice farmers in the region, both those who apply the Tabela and Tapin methods, have a great opportunity to increase production and expand their agricultural businesses. Considering their age is still relatively young and productive, these farmers are expected to be able to optimize their potential in developing and advancing the agricultural sector in the area.

Table 4. Characteristics of Respondents Based on Education Level

No.	Characteristic	Direct Seed (Tabela)		Planting Moves (Tapin)	
	Education Level	Total	Percentage (%)	Total	Percentage (%)
1	SD	50	55,56	56	61,54
2	SMP	22	24,44	19	20,88
3	SMA	18	20	16	17,58
	Total	90	100,00	91	100,00

Source: primary data processing results, 2024

Table 4 explains that the education level of farmers is grouped into three different categories, namely elementary, junior high and high school. The results of the study showed that farmers who used the Tabela system with an elementary education background amounted to 50 respondents (55.56%), respondents with a junior high school background amounted to 22 respondents (24.44%) and respondents with a high school education background amounted to 18 respondents (20%). Meanwhile, farmers who use the Tapin system with an elementary education background amounted to 56 respondents (61.54%), respondents with a junior high school background amounted to 19 respondents (20.88%) and respondents with a high school background amounted to 16 respondents (17.58%). Based on the explanation above, it can be concluded that the majority of farmers in Tanah Miring District have an elementary education background. The level of education of farmers is an important aspect that affects their ability to absorb new information and adopt technological innovations, especially in the field of rice farming. Education in general shapes the way farmers think. Farmers with higher levels of education tend to be faster and easier in understanding and implementing new technologies (Asih & Sulaeman, 2021). This in turn can encourage the improvement and development of their agricultural businesses more effectively.

Table 5. Characteristics of Respondents Based on Farming Experience

No.	Characteristic	Direct Seed (Tabela)		Planting Moves (Tapin)	
	Farming Experience	Total	Percentage (%)	Total	Percentage (%)
1	5-15	62	68,89	68	74,72
2	16-30	27	30	22	24,17
3	>30	1	1,11	1	1,10
	Total	90	100,00	91	100,00

Source: primary data processing results, 2024

Table 5 explains that Farming Experiences are grouped into three different categories, namely farmers with 5-15 years of farming experience, 16-30 years and more than 30 years. The results showed that farmers who used the Tabela system with 5-15 years of farming experience amounted to 62 respondents (68.89%), 16-30 years of farming experience amounted to 27 years (27%), and respondents with more than 30 years of farming experience amounted to 1 respondent (1.11%). Meanwhile, farmers who use the Tapin system with 5-15 years of farming experience amounted to 68 respondents (74.72%), 22 respondents (24.17%) had 16-30 years of farming experience, and 1 respondent (1.10%) had more than 30 years of farming experience. Based on the explanation above, it can be concluded that the majority of farmers in Tanah Miring District have 5 to 15 years of farming experience. Experience in farming is a key factor that greatly affects the success of agricultural businesses. The majority of farmers who are respondents have been pursuing this profession for a long time. There is a close correlation between the length of farming experience and the age of the farmer. Generally, the older a farmer gets, the more experience they have gained in agriculture (Gunawan et al., 2022). In addition, there is a tendency that farmers who manage larger paddy fields to also have a higher level of experience in their farming efforts.

Table 6. Characteristics of Respondents Based on the Number of Dependents

No.	Characteristic	Direct Seed (Tabela)		Planting Moves (Tapin)	
	Number of Dependents	Total	Percentage (%)	Total	Percentage (%)
1	1-2	62	68,89	66	72,53
2	3-4	24	26,66	20	21,97
3	>4	4	4,44	5	5,49
	Total	90	100,00	91	100,00

Source: primary data processing results, 2024

Table 6 explains that Farming Experience is grouped into three different categories, namely farmers with several dependents of 1 to 2 dependents, 3 to 4 dependents and more than 4 dependents. The results of the study showed that farmers who used the Tabela system with the number of dependents 1-2 amounted to 62 respondents (68.89%), the number of dependents with the number of dependents 3-4 amounted to 24 respondents (26.67%), and farmers with the number of dependents for more than 4 years amounted to 4 respondents (4.44%). Meanwhile, farmers who use the Tapin system with several dependents 1 to 2 amounted to 66 respondents (72.53%), the number of dependents 3 to 4 amounted to 20 years (21.97%) and farmers with more than 4 dependents amounted to 4 respondents totalling 5 respondents (5.49%). The number of family dependents refers to the total number of family members who are under the responsibility of a Head of Family (KK). This group includes couples (wives), children, and other family members who live together and are part of the same household unit (Susanta et al., 2016). Based on the explanation above, it can be concluded

that the majority of farmers in Tanah Miring District have several dependents of 1 to 2 dependents. Family members who are dependents of farmers can be considered valuable labour resources in supporting farming activities. In the context of respondent farmers, the number of family dependents tends to be not too much. This condition has a double positive impact: on the one hand, the financial burden to meet the needs of families is relatively lighter, and on the other hand, existing resources can be allocated more effectively as capital to develop agricultural businesses (Ahmadia et al., 2022).

Table 7. Characteristics of Respondents Based on Land Area

No.	Characteristic	Direct Seed (Tabela)		Planting Moves (Tapin)	
	Land	Total	Percentage (%)	Total	Percentage (%)
1	1-1,5	61	67,78	66	72,53
2	2-2,5	21	23,33	14	15,38
3	3	6	6,67	9	9,89
4	4	2	2,22	2	2,19
Total		90	100,00	91	100,00

Source: primary data processing results, 2024

Table 7 explains that the land area of farmers is grouped into four different categories, namely farmers with land areas of 1 to 1.5, 2 to 2.5, 3 and 4. The results of the study showed that farmers who used the Tabela system with land area 1 to 1.5 amounted to 61 respondents (67.78%), with land areas 2 to 2.5 amounted to 21 respondents (23.33%), with land area 3 amounted to 6 respondents (6.67%), and respondents with land area 4 amounted to 2 respondents (2.22%). Meanwhile, farmers who use the Tapin system with land areas 1 to 1.5 amounted to 66 respondents (72.53%), with land areas 2 to 2.5 amounting to 14 respondents (15.38%), with land area 3 amounting to 9 respondents (9.89%), and farmers with land area 4 amounting to 2 respondents (2.19%). Based on the explanation above, it can be concluded that the majority of farmers in Tanah Miring District have a land area of 1 to 1.5. The size of the land managed by a farmer has a significant influence on agricultural production. There is a positive correlation between the area of agriculture and the level of productivity of farming businesses. When farmers have access to more land, the potential to increase crop yields becomes greater (Tiara et al., 2023).

Table 8. Statistical Results of Different Tests

Group Statistics					
	Sistem	N	Mean	Std. Deviation	Std. Error Mean
Acceptance	Tapin	91	21.801.758,24	5.065.177,707	530.974,899
	Table	90	20.003.133,33	3.018.398,505	318.167,139
Income	Tapin	91	10.653.443,13	4.571.203,683	479.192,351
	Table	90	9.444.116,67	3.055.907,023	322.120,884

Based on the data in the Group Statistics table above, it can be known the differences between the rice planting system and the Tapin (transplanting) and Tabela (stocking system) systems as follows:

1. System (Tapin and Tabela):
    a. The systems are the two groups that are compared in the analysis.
    b. Each system has data for two variables: Revenue and Revenue.
2. N (Sample Size):
    a. N indicates the number of observations or samples in each group.

b. For Tapin, N = 91, meaning there are 91 samples or observations.
c. For Tabela, N = 90, meaning that there are 90 samples or observations.

3. Mean (Rata-rata):
   a. The mean is the average value of all observations in each group.
   b. The Tapin system received a higher average revenue (21,801,758.24) compared to Tabela (20,003,133.33).
   c. The income of the Tapin system shows a higher average income of 10,653,443.13, while Tabela is 9,444,116.67.
4. Std. Deviation (Standard Deviation):
   a. Standard deviation measures the distribution or variability of data from the mean.
   b. Acceptance, the Tapin system has a larger standard deviation (5,065,177,707) than Tabela (3,018,398,505)
   c. Revenue, the Tapin system has a larger standard deviation (4,571,203,683) than Tabela (3,055,907,023).
5. Std. Error Mean (Standard Error of Mean):
   a. Standard Error is an estimate of the standard deviation of the sampling mean distribution.
   b. Acceptance, the Tapin system has a higher error mean standard (530,974,899) than Tabela (318,167,139).
   c. Revenue, Tapin has a higher standard error mean (479,192,351) than Tabela (322,120,884).

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Mr.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Acceptance	Equal variances assumed	47.963	.000	2.898	179	.004	1.798.624,908	620.641,716	573.909,238	3.023.340,579
	Equal variances are not assumed.			2.906	147.061	.004	1.798.624,908	619.002,965	575.334,825	3.021.914,992
Income	Equal variances assumed	25.230	.000	2.090	179	.038	1.209.326,462	578.624,410	67.523,769	2.351.129,155
	Equal variances are not assumed. d			2.094	157.246	.038	1.209.326,462	577.396,893	68.872,217	2.349.780,707

Based on the results of the "Independent Samples Test" test above, it can be known:

1. The analysis of the difference test on Acceptance between the Tapin and Tabela rice planting systems revealed significant differences based on the Output Independent Samples Test table. This finding is supported by a probability value (Sig-t) of 0.004, which is well below the established level of significance (α = 0.05). These results provide strong evidence that there is a real difference in Reception between the two systems. The Tapin

system showed superior performance with an average revenue of 21,801,758.24, while Tabela recorded an average of 20,003,133.33. The substantive average difference, which is 1,798,624,908, confirms the economic advantages of the Tapin system.

2. The analysis of the difference test on income between Tapin and Tabela rice planting systems also produced significant findings based on the Output Independent Samples Test table. The difference in Revenue between these two systems is shown to be statistically significant, with a probability value (Sig-t) of 0.038, which is below the set level of significance ($\alpha = 0.05$). These results show that there is a real difference in revenue between the Tapin and Tabela systems. The Tapin system again showed an advantage with an average income of 10,653,443.13, while Tabela recorded an average of 9,444,116.67. A substantial average difference, of 1,209,326,462, reinforces indications that the Tapin system is more financially profitable.

A comparative analysis of the income of rice farming in the Tapin and Tabela systems was carried out to see the comparison of income both real and statistical, terms of real comparative analysis of the income of rice farming in the Tapin and Tabela systems, there is a difference between the income of rice farming in Tapin and Tabela systems. These findings are in line with the findings of Ahmadia et al., (2022) who state that the income of rice farming in the Tapin system is significantly different from the Tabela system.

The difference in income and income of rice farmers in Tanah Miring District that occurred caused rice production to decrease, one of which was due to climate change. Factors that affect climate change include:

1. Farmers' Knowledge of Climate Change
   Of the 181 samples interviewed, most farmers do not know about climate change, farmers cannot explain in detail what is meant by climate change and usually farmers only consider climate change to be the pancaroba season.
2. Changes in the Planting Period
   Changes in the planting period were experienced by several farmers in 3 villages in Tanah Miring District. Where farmers' planting time has changed due to climate change. Some planted rice 2 weeks later than the previous planting estimate and some even passed a month of the planting period. Changes in the planting period also experience differences from the rice planting system, farmers who plant rice with the Tabela system, make changes to the planting period because they wait for the water not to be flooded, because if this is not the case, the seeds that are spread will rot due to waterlogging. Meanwhile, farmers who use planting with the Tapin system, some plant according to the planting time because it is hoped that the seeds used are strong enough for waterlogging.
3. Extreme weather and OPT attacks
   As a result of climate change, there are more and more attacks of plant pest organisms on rice in Merauke Regency. High rainfall results in high humidity so there are more pests on plants, so many farmers experience crop failure or puso.

D. Conclusion

Analysis of different tests on the revenue and income of the Tapin and Tabela rice planting systems with revenue sig 0.004 and revenue sig 0.038. These results show differences in revenue and income between the two planting systems with Tapin revenue being IDR 21,801,758.24 and Tabela revenue being IDR 20,003,133.33. Tapin's income is IDR

20,003,133.33 and Tabela's income is IDR 9,444,116.67 per planting season. Climate change also greatly influences the planting of Tapin and Tabela, where factors influencing climate change include farmers' lack of knowledge of climate change, changes in planting periods, and extreme weather and pest attacks.

E. References

Ahmadia, A., Christoporus, C., (2022). Comparative Analysis of Rice Farming Income of Tabela and Tapin Systems in Siwalempu Village, Sojol District, *Agricultural Sciences (E* Http://Jurnal.Faperta.Untad.Ac.Id/Index.Php/Agrotekbis/Article/View/1415

Asih, D. N., & Sulaeman, S. (2021). Income Analysis of Rice Farming Rice Farming Moving Planting System in Bambaira Village, Bambaira District, North Mamuju Regency. *Agrotechbis: Journal of Science* ...http://jurnal.faperta.untad.ac.id/index.php/agrotekbis/article/view/778

BPS Merauke Regency. 2020. Merauke Regency in Numbers. Bps Merauke. Merauke Central Statistics Agency. (2023). Lopsided Land District in Numbers.

Gregorius Andana*, Maria M.D. Widiastuti, Untari. 2021. Analysis of the Feasibility of Farming Businesses of 3 Types of Rice. **Musamus Journal Of Agribusiness (Mujagri).** Vol .4 No. 01 of 2021

Gupito, Irham, & Waluyati. 2014. Analysis of Farming. Jakarta. University of Indonesia.Soekidjo Noto Atmojo. 2003. Health Research Methodology. Jakarta: Rineka Cipta.

Ginting, N. (2019). Analisis Pendapatan Usaha Jamur Tiram Crispy. *Musamus Journal of Agribusiness*, *Query date: 2022-09-09 02:30:26*. http://www.ejournal.unmus.ac.id/index.php/agri/article/view/2086

Gunawan, G., Tomy, J., & ... (2022). Comparative Analysis of Rice Farming Income of Tabela and Tapin Systems in Bangkir Village, South Dampal District, Toli-Toli Regency. ... *AGRICULTURAL SCIENCE (e* ...http://jurnal.faperta.untad.ac.id/index.php/agrotekbis/article/view/1400

Kilmanun, J. C. and Sugiarti, T. 2015. Prospects for the Development of Ubijalar Farming Business in West Kalimantan (Case Study: Rasau Jaya II Village, Rasau Jaya District, Kubu Raya Regency). Proceedings of the Seminar on the Results of Research on Various Crops of Beans and Tubers.

Lamia, K. A. 2013. Factors that affect the income level of fishermen in Tumpaan District, South Minahasa. Emba Journal, Vol.1 No.4.

Pakiding, Yanuarius, 2016, The Relationship of Asset Management in the Optimization of Fixed Assets (Land and Buildings) of Local Governments (Case Study in Bantul District), S2 Thesis of UGM Postgraduate Program, Yogyakarta (Unpublished).

Susanta, I. W. E., Antara, M., & ... (2016). Analysis of Rice Field Farming Income Direct Seed Planting Method in Astina Village, Torue District, Parigi Moutong Regency. ... *AGRICULTURAL SCIENCE (e* ...http://jurnal.faperta.untad.ac.id/index.php/agrotekbis/article/view/84

Syakir, M and E. Karmawati. 2013. Potential of Sago Plants (Metroxylon Spp) as a raw material for bioenergy. Perspective. Plantation Research and Development Center, 12 (2) 57-64

Sugiyono, 2015. Quantitative, qualitative, and R and D. alfabeta research methods.

Sugiyono. 2012. Administrative Research Methods Complemented by R and D Methods. Bandung: Alfabeta Publishers.

Soekartawi. 2014. Analysis of Farming. Jakarta. University of Indonesia.Soekidjo Noto Atmojo. 2003. Health Research Methodology. Jakarta: Rineka Cipta.

Tiara, T., Akrab, A., & Erny, E. (2023). Income Analysis of Paddy Rice Farming (Oryza Sativa L.) Direct Seed Planting System (Tabela) in Siboang Village, Sojol District. *Journal of Agribusiness Development.*http://Jurnal.Faperta.Untad.Ac.Id/Index.Php/Jpa/Article/View/1780