International Journal of Economic Literature (INJOLE) e-ISSN: 3026-0221
Vol. 2 No. 10 July 2025, page., 1237-1259

ANALYSIS OF STAKEHOLDER ROLES IN THE SUSTAINABILITY OF RED RICE FARMING IN JATILUWIH VILLAGE

I Gusti Ayu Agung Bintang Setya Maharani, Ni Nyoman Reni Suasih
Faculty of Economics and Business; Udayana University
Corresponding Author agungbintang968@gmail.com

Abstract: This study aims to analyze the roles of stakeholders in supporting the sustainability of red rice farming in Jatiluwih Village, Tabanan Regency, Bali, which is recognized as a sustainable agricultural area through the Subak system acknowledged by UNESCO as a world cultural heritage. The research adopts a descriptive quantitative approach using a survey method involving six main actors: farmers, the Subak organization, the agricultural office, the private sector, the traditional village (desa adat), and the Subak cooperative. Analysis was conducted using the MACTOR method to identify the influence and relationships among stakeholders and their alignment with sustainability goals in farming practices. The results show that active stakeholder involvement plays a significant role in supporting the economic, social, and environmental dimensions of red rice farming systems. Collaboration among these actors contributes to increased farmers' income, environmental conservation, and the strengthening of local cultural values. Continuous synergy between the government, traditional communities, and the private sector is required to preserve the traditional agricultural system while improving the welfare of the local population.
Keywords: Agricultural Sustainability, Stakeholder Roles, Prospective Analysis – MACTOR

INTRODUCTION

Agricultural activity is a vital effort to meet human needs, particularly in fulfilling the continuously growing demand for food in line with population growth. The increasing demand for food has led to rapid development in the agro-industrial sector, and the concept of the Green Revolution has caused a decline in environmental awareness (Mamahit et al., 2021). The agricultural sector plays a crucial role, as Indonesia's GDP is predominantly supported by this sector, as presented in Table 1.

Table Error! No text of specified style in document.**. Distribution of Gross Domestic Product/Gross Regional Domestic Product at Current Prices by Industrial Sector in Indonesia, 2019-2023**

Business Field	Distribution of GDP Based on Current Prices (%) (Percent)				
	2019	2020	2021	2022	2023
A. Agriculture, Forestry and Fisheries	12.71	13.70	13.28	12.40	12.53
B. Mining and Excavation	7.26	6.43	8.97	12.22	10.52
C. Processing/Manufacturing Industry	19.70	19.87	19.24	18.34	18.67
D. Procurement of Electricity and Gas	1.17	1.16	1.12	1.04	1.04

E. Water Supply, Waste Management, Waste,	0.07	0.07	0.07	0.06	0.06
F. Construction	10.75	10.70	10.44	9.77	9.92
G. Wholesale and Retail Trade; Car and Motorcycle Repair	13.01	12.91	12.96	12.85	12.94
H. Transportation and Warehousing	5.57	4.47	4.24	5.02	5.89
I. Provision of Accommodation and Meals Drink	2.78	2.55	2.43	2.41	2.52
J. Information and Communication	3.96	4.51	4.41	4.15	4.23
K. Financial Services and Insurance	4.24	4.51	4.34	4.13	4.16
L. Real Estate	2.78	2.94	2.76	2.49	2.42
M. Corporate Services	1.92	1.91	1.77	1.74	1.83
N. Government Administration, Defense, and Compulsory Social Security	3.61	3.79	3.46	3.09	2.95
O. Educational Services	3.30	3.57	3.28	2.89	2.79
P. Health Services and Social Activities	1.10	1.30	1.34	1.21	1.21
Q. Other services	1.95	1.96	1.84	1.81	1.94
Gross domestic product	100.00	100.00	100.00	100.00	100.00

Source: BPS, 2024

Most of the population lives in rural areas and works as farmers (Junior and Wenagama, 2020). Agricultural activity is a vital effort to meet human needs, particularly in fulfilling the increasing demand for food, which grows in line with the rise in population. The growing demand for food has driven rapid developments in the agro-industrial sector, and the concept of the Green Revolution has contributed to a decline in environmental awareness (Mamahit et al., 2021).

Based on Table 1, agriculture remains one of the most important sectors in Indonesia's economy, contributing significantly to the national Gross Domestic Product (GDP). According to data from Statistics Indonesia (BPS), agriculture is the third-largest contributor to GDP after the manufacturing and wholesale and retail trade sectors, including the repair of motor vehicles and motorcycles. In 2023, the agricultural sector accounted for approximately 12.53 percent of Indonesia's GDP and has continued to show annual growth. These data confirm the sector's role as one of the main pillars supporting food security and livelihoods, particularly in rural areas. Although the sector's contribution has experienced fluctuations due to global and domestic challenges, agriculture remains a fundamental foundation for economic development, especially in regions highly dependent on farming for their livelihood (Badan Pusat Statistik, 2024).

Table 2 shows that the agricultural sector also plays a highly significant role in the province of Bali. A large portion of the community's income is derived from this sector, highlighting the importance of agriculture for local economic well-being. This is evident

from the distribution of Bali's Gross Regional Domestic Product (GRDP) at current prices, where the agricultural sector ranks just below the accommodation and food and beverage service sector. In other words, agriculture in Bali functions not only as a source of income but also as a major support for other sectors, particularly those related to tourism and services (Badan Pusat Statistik, 2024).

Table 2. Distribution of Gross Regional Domestic Product at Current Prices by Business Sector Category in Bali Province, 2019-2023

Business Field	Distribution of GRDP Based on Current Prices (%) (Percent)				
	2019	2020	2021	2022	2023
A. Agriculture, Forestry, and Fisheries	13.45	15.09	15.77	14.67	13.73
B. Mining and Excavation	0.87	0.95	0.97	0.94	0.89
C. Processing/Manufacturing Industry	6.04	6.44	6.68	6.58	6.24
D. Procurement of Electricity and Gas	0.23	0.22	0.21	0.23	0.23
E. Water Supply, Waste Management, Waste	0.17	0.19	0.19	0.17	0.16
F. Construction	9.53	10.52	10.97	10.65	9.77
G. Wholesale and Retail Trade; Car and Motorcycle Repair	8.57	9.04	9.22	9.19	8.97
H. Transportation and Warehousing	9.79	6.95	5.64	7.70	10.08
I. Provision of Accommodation and Food and Beverages	23.25	18.33	16.60	17.98	19.93
J. Information and Communication	5.31	6.36	6.73	6.13	5.66
K. Financial Services and Insurance	3.99	4.25	4.39	4.68	4.84
L. Real Estate	3.89	4.43	4.58	4.35	4.03
M. Corporate Services	1.04	1.15	1.15	1.17	1.15
N. Government Administration, Defense, and Compulsory Social Security	4.93	5.89	6.21	5.56	5.06
O. Educational Services	5.15	5.88	6.10	5.55	4.98
P. Health Services and Social Activities	2.18	2.58	2.83	2.64	2.48
Q. Other services	1.62	1.74	1.76	1.80	1.79
Gross domestic product	100.00	100.00	100.00	100.00	100.00

Source: BPS Bali Province, 2024

The development and enhancement of agricultural sector productivity in Bali are crucial to ensuring the economic sustainability of local communities. Moreover, efforts to improve both the quality and quantity of agricultural output will contribute significantly to food security and the overall well-being of the population. Therefore, the agricultural sector plays a role not only in the economic sphere but also in preserving local culture and traditions, which are deeply intertwined with agricultural practices in the region.

In 2023, the agricultural sector contributed approximately 13.73 percent to the economy. This marks a decline compared to previous years. During the COVID-19

pandemic (2020–2021), the sector experienced a temporary increase, reaching a peak of 15 percent. However, as the economy entered the recovery period in 2022, the contribution of this sector began to decrease, continuing into 2023. This decline was primarily driven by reduced production in food crops—especially rice—as well as in seasonal plantation crops, annual horticulture, and permanent plantations. The El Niño phenomenon, which led to lower rainfall and drier-than-usual conditions, was a major factor disrupting production activities in 2023. In addition, the decline can also be attributed to land-use change and a reduction in the number of farmers, both of which have had negative impacts on productivity and the sustainability of the agricultural sector. These conditions pose a significant threat to agricultural productivity and sustainability, particularly in Bali (Badan Pusat Statistik Provinsi Bali, 2024).

According to Pratiwi et al. (2023), agriculture remains a leading sector in Tabanan Regency, as shown in Table 3. The agricultural sector continues to make a significant contribution to the economy of Tabanan, a trend that has persisted over the past five years—even during the COVID-19 pandemic. One of the main factors influencing this contribution is rice production, which is a primary agricultural commodity in Bali. To advance the agricultural sector, farmers are expected to improve their productivity, as this is a crucial factor in the success of any enterprise, particularly in agriculture (Prapnuwanti & Sudiana, 2019).

Table 3. Rice Production in 2022 and 2023 by Regency/City in Bali Province (Tons)

No	Regency	Rice Production in 2022 and 2023 by Regency/City in Bali Province (Tons)	
		2022	2023
1	Jembrana	32,798.97	36,010.82
2	Tabanan	95,458.21	95,591.17
3	Badung	56,060.80	59,052.50
4	Gianyar	75,377.68	69,603.13
5	Klungkung	14,513.05	16,124.66
6	Bangli	12,198.81	11,604.08
7	Asem Coral	29,376.81	26,860.16
8	Buleleng	51,155.13	51,536.06
9	Denpasar City	16,889.70	13,480.93
Total		383,829.16	379,869.53

Source: Central Bureau of Statistics (2024)

In 2023, Tabanan Regency made a significant contribution to rice production in Bali, supplying as much as 95,591 tons. In addition to being known as a producer of high-quality white rice, Tabanan also has the unique distinction of producing red rice, particularly from Jatiluwih Village. This diversity in rice production not only fulfills local demand but also contributes to the overall rice supply across Bali. The cultivation of two types of rice allows farmers in Tabanan to increase their income, as product

diversification helps them avoid dependence on a single rice variety while tapping into the market potential for red rice. Tabanan Regency's substantial contribution to Bali's rice production plays a crucial role in achieving food self-sufficiency and reducing the island's dependence on rice imports from other regions.

In this context, Jatiluwih Village serves as a tangible example of the strength of Bali's agricultural sector. Situated in Tabanan Regency, which is widely regarded as the rice barn of Bali, the village is home to the Subak system—a traditional irrigation cooperative that was recognized by UNESCO (United Nations Educational, Scientific and Cultural Organization) as a World Cultural Heritage site in 2012 during its first session held in Saint Petersburg, Russia (Lestari et al., 2019). The Subak system in Jatiluwih, as part of the Cultural Landscape of Bali, is a vital symbol of the importance of preserving rice farming. Beyond the scenic beauty of the terraced rice fields, its deeper symbolic meaning lies in the concept of food security for the Balinese people through rice cultivation (Rachman et al., 2022). This further emphasizes the crucial role of agriculture in maintaining local tradition and supporting the local economy. With growing public attention on the expansive rice fields of Jatiluwih, it becomes clear that the agricultural sector contributes not only to income generation but also to cultural and environmental preservation in Bali.

Among the agricultural products in Jatiluwih, red rice holds particular distinction. Red rice is a whole grain that is richer in nutrients and fiber compared to white rice. It is a low-calorie carbohydrate source, high in fiber, gluten-free, and contains no trans fats. Historically, red rice is native to tropical Asia, naturally distributed across the Indonesian archipelago, India, and even Australia. It is often consumed by those on a diet due to its believed potential to aid in weight loss. Red rice, especially in its whole grain form, is fat-free and high in fiber (Yastini et al., 2023).

Harvesting rice with modern technology offers many advantages over traditional methods, including improved quality of yields, enhanced sterilization of agricultural products, faster harvesting processes for large land areas, and reduced physical burden for farmers during harvest (Lubis et al., 2021). However, some farmers in Jatiluwih may still rely on less efficient traditional farming methods.

The declining interest of younger generations in farming is not only occurring in the Subak system of Jatiluwih but also across Indonesia. Several factors contribute to this decline, including: (i) the perception that income from non-agricultural sectors is higher than from farming, (ii) negative perceptions of agriculture as dirty and labor-intensive work due to frequent contact with mud and manual labor such as plowing, (iii) the belief that agriculture does not require high education levels, whereas non-agricultural sectors often demand higher education and offer clearer career paths, and

(iv) the high risks involved in farming, such as crop failure due to natural disasters, price fluctuations, and other uncertainties (Rachmawati, 2021). On the other hand, since UNESCO designated Subak Jatiluwih as a World Cultural Heritage Site, the local community's work rhythm has shifted, especially due to the growth of the tourism sector. Many residents now prefer working in tourism, which offers more employment opportunities. Consequently, less labor is allocated to rice fields (Prasiasa et al., 2023).

The lack of public awareness about the dangers of chemical fertilizers and synthetic pesticides to human health and the environment—such as damage to local ecosystems, soil quality, and water sources—has led to a shift toward organic farming. Organic agriculture represents an agribusiness development effort that enhances land productivity by utilizing local potentials, including natural and human resources. It forms part of a broader initiative to promote socially and ecologically sustainable farming systems. Nevertheless, a failure to adopt organic practices can lead to a decline in agricultural product quality, ultimately affecting market competitiveness and consumer health (Parah & Nauly, 2022).

To address these challenges, one of the key strategies is to strengthen stakeholder collaboration. Cooperative efforts among relevant stakeholders can help villages overcome obstacles and accelerate the development of rural tourism areas, as each stakeholder contributes according to their respective roles and responsibilities (Paristha et al., 2022).

Furthermore, collaboration and partnerships between the government, farmers, researchers, and the private sector are essential in developing a sustainable agricultural system. Effective collaboration facilitates the exchange of knowledge, technology, and resources to achieve common goals. Attention must also be given to social, economic, and environmental aspects in the development of sustainable agriculture. Ensuring farmers' access to markets, improving working conditions, and empowering smallholder farmers are critical factors. Ultimately, the development of sustainable agriculture is a crucial step toward achieving food security. By adopting sustainable practices, we can protect the environment, enhance food resilience, and build a sustainable future.

METHOD

This research employed a quantitative approach with a descriptive design aimed at systematically portraying the conditions and roles of stakeholders in the sustainability of red rice farming in Jatiluwih Village. The study relied on a survey method involving 30 respondents from relevant institutions, which subsequently served as the basis for focus group discussions (FGD) to gain deeper insights into the dynamics among stakeholders. Data analysis was conducted using the MACTOR software to measure direct and indirect

influences, as well as potential relationships among actors within the sustainability system (Wardono et al., 2019).

The research was conducted in Jatiluwih Village, Tabanan Regency, Bali, known as one of the centers of organic rice farming, particularly red rice. This area possesses ecological advantages, including a cool climate, fertile soil, and a traditional Subak irrigation system that supports sustainable agricultural practices. The location was selected based on data from the Central Bureau of Statistics, which highlights Jatiluwih's significant contribution to rice production in Bali and its recognition as a world cultural heritage site that exemplifies the harmony between humans and nature in agricultural management (Widyawati & Sukadana, 2021).

The research objects included key stakeholders such as farmers, Subak organizations, local government, private sector actors, cooperatives, and customary villages, all of whom play vital roles in ensuring agricultural sustainability. The sampling was conducted using purposive sampling techniques to ensure that the selected respondents genuinely represented the local conditions and interests. Data were collected through questionnaires and FGDs, then analyzed both quantitatively and qualitatively to produce a map of power relations, levels of support for objectives, and the convergence and divergence of attitudes among actors using the MACTOR method (Ariyani et al., 2020; Sugiyono, 2019).

RESULTS AND DISCUSSION

Overview of Research Location

Geographical Conditions

Jatiluwih Village has an area of around 300 hectares of rice fields, with most of its people working as farmers. The location of this village is at an altitude of around 700 meters above sea level, which provides a cool climate all year round. This area is dominated by rice fields, plantations, and forests. Administratively, Jatiluwih Village is included in the Penebel District, Tabanan Regency. This village borders:

1) North: Wongaya Gede Village
2) East: Babahan Village
3) South: Senganan Village
4) West: Gunung Salak Village

The geographical conditions and land use in this area are very supportive of the development of farming, especially for red rice. Fertile soil, a well-maintained Subak irrigation system, and a culture of mutual cooperation among the community are the main capital in supporting sustainable agriculture.

Demographic Conditions

Jatiluwih Village is a rural area located in Penebel District, Tabanan Regency, Bali Province. The name "Jatiluwih" comes from the word "Jati" which means original and "Luwih" which means beautiful or good. As the name suggests, Jatiluwih is known as a village that has original and sustainable natural beauty, with vast expanses of terraced rice fields and cool and clean air.

The village is also known as an agricultural area that still maintains the Subak system, a traditional Balinese irrigation system based on local wisdom and togetherness. In 2012, the Subak Jatiluwih rice field area was recognized as a World Cultural Heritage by UNESCO in the category of Cultural Landscape of Bali Province: the Subak System as a Manifestation of the Tri Hita Karana Philosophy. Since then, attention to environmental sustainability and sustainable agricultural practices has increased.

One of the leading commodities in this village is red rice, which has high economic value and is part of the local identity of the Jatiluwih community. Agricultural practices in this village, both traditional and those that are starting to move towards organic systems, help maintain the quality of rice and maintain a sustainable ecosystem.

Description of Data Related to Research Variables

Respondent Characteristics

1. Red Rice Farmers in Jatiluwih Village

Five respondents from the red rice farmer community, who have been involved in red rice farming for more than five years, play an important role in the sustainability of this red rice farming business. These farmers have received training from various parties on effective and sustainable red rice farming techniques, and have gained economic benefits through mutually beneficial partnerships.

2. Jatiluwih Subak

A total of five respondents who are active members of Subak Jatiluwih, with an age range of 38–66 years and educational backgrounds ranging from Elementary School to High School, have been directly involved in the preservation of the traditional subak farming system which has been recognized as a World Cultural Heritage by UNESCO since 2012. They play an important role in maintaining the sustainability of traditional irrigation sourced from the Mount Batukaru spring, as well as being active in religious ritual activities that are integrated with the farming system.

3. Department of Agriculture, Tabanan Regency

Five respondents from the Tabanan Regency Agriculture Service, aged between 32–55 years with a Bachelor's degree. They play a role in helping to provide counseling on farming methods. This service also helps in developing supporting tourism infrastructure in Jatiluiwih Village, such as improving road access and public facilities.

4. Jatiluiwih Traditional Village

A total of five respondents from Jatiluwih Traditional Village, with an age range of 26–59 years and educational backgrounds ranging from Elementary School to College, are traditional figures and village administrators who actively maintain the sustainability of local cultural values. These respondents have consistently contributed to the management of customary areas and the preservation of the subak system as an inseparable part of ancestral heritage. They play an important role in decision-making related to village spatial planning, the implementation of traditional ceremonies related to agriculture such as Ngusaba Nini, and supervision of tourism development to ensure that it remains in line with the principles of Tri Hita Karana.

5. Jatiluwih Subak Cooperative

A total of four respondents from the Jatiluwih Cooperative, with an age range of 22–69 years and educational backgrounds ranging from high school to Bachelor of Economics, have been actively involved in managing agricultural products and developing community-based economics in the Jatiluwih Subak area. They have experience in cooperative management, especially in efforts to improve farmer welfare through a joint marketing system and strengthening the local economy. The respondents play an important role in managing cooperative business units such as the sale of Jatiluwih organic rice and the processing of agricultural derivative products.

6. Private Parties

A total of five respondents from the Dharma Santika Regional Company, aged 22–32 years and with a Bachelor of Economics and Management degree, have actively partnered with Subak Jatiluwih farmers in supporting the distribution and marketing system of local agricultural products, especially red rice. Since the start of formal cooperation with cooperatives and traditional villages in 2015, the company has played a strategic role in expanding the market reach of Jatiluwih agricultural products to the retail and tourism sectors. The respondents were directly involved in the packaging, branding, and sales strategy development processes, including cooperation with ecotourism-based souvenir shops, restaurants, and hotels.

Description of Data Related to Sustainable Red Rice Farming in Jatiluwih

Sustainable agricultural development in Jatiluwih requires synergy from various parties. Identification of stakeholders who play a role in red rice farming shows that there are various actors who have interests and influence on the sustainability of this system.

Table 4. List of Stakeholders Involved in the Sustainability of Red Rice Farming Business in Jatiluwih Village

No	*Stakeholder*	Main Role
1	**Brown Rice Farmer**	**Main actors in cultivation and production**

2	**Jatiluwih Subak**	**Irrigation system managers and social institutions**
3	**Department of Agriculture, Tabanan Regency**	**Policy assistance and technical assistance**
4	**Jatiluwih Traditional Village**	**Protector of local cultural and customary values**
5	**Subak Cooperative**	**Support in distribution, marketing and input**
6	**Private Sector**	**Product distribution and promotion partners**

The active involvement of the above stakeholders is an important factor in ensuring that the red rice farming business in Jatiluwih Village can be economically, socially, and ecologically sustainable. Cooperation between local and external actors is expected to strengthen the position of farmers and make Jatiluwih a model of sustainable agriculture based on local wisdom.

Results of Analysis of Research Data

Results of Direct Influence Matrix Analysis Between Actors

Based on the results of the analysis using the MACTOR method, the direct influence matrix between actors is related to the sustainability of farming businesses in Jatiluwih Village, as shown in Table 5 below.

Table 5. Direct and Indirect Influence Matrix (MDII)

MDII	**Farmer**	**Subak**	**Private Sector**	**Department of Agriculture, Tabanan Regency**	**Village Custom**	**Subak Cooperative**	***Level of Influence***
Farmer	**6**	**11**	**11**	**12**	**7**	**11**	**52**
Subak	**6**	**10**	**10**	**11**	**7**	**10**	**44**
Private sector	**6**	**8**	**8**	**8**	**6**	**8**	**36**
Tabana District Agriculture Service	**6**	**8**	**8**	**8**	**6**	**8**	**38**
Traditional Village	**6**	**7**	**7**	**7**	**6**	**7**	**34**
Subak Cooperative	**6**	**8**	**8**	**8**	**6**	**8**	**36**
Degree of Influence	**30**	**42**	**44**	**46**	**32**	**44**	**238**

Source: Primary Data Processed With Mactor, 2025

Based on Table 5 above, it shows that the Farmer actor has the highest level of influence on other actors with a total influence score of 52, and an influx (dependence) score of 44. This indicates that farmers are the most dominant actors in the system and have a strategic role in influencing dynamics and decision making, with a relatively lower level of dependency compared to the influence they exert.

Meanwhile, the Private Sector actor has an influence score on other actors of 36 and a dependency score of 36 as well. This indicates a relatively balanced position, where the private sector has the ability to influence the system but is also affected equally by the decisions of other actors. This means that this actor tends to be in the middle position, which can bridge various interests in the system. The Traditional Village actor recorded an influence score on other actors of 34, with a dependency score of 36. This position indicates that traditional villages tend to be more passive actors, who receive more influence than they give influence. With a small difference between outgoing and incoming influence, the position of traditional villages is classified as dependent but not too weak, and still has the opportunity to be actively involved if supported by more dominant actors.

Overall, farmer actors occupy the most strategic position in the system with high influence and lower dependency, making them key actors capable of directing policies and changes. On the other hand, traditional villages and the private sector are in a more balanced position or tend to be influenced, which requires greater synergy to be able to increase their role in the system.

Table 6. Value convergence matrix (2CAA)

2CAA	Farmer	Subak	Private Sector	Department of Agriculture, Tabanan Regency	Traditional Village	Subak Cooperative
Farmer	**0.0**	**26.0**	**23.5**	**26.0**	**25.0**	**20.5**
Subak	**26.0**	**0.0**	**24.5**	**27.0**	**26.0**	**21.5**
Private Sector	**23.5**	**24.5**	**0.0**	**26.5**	**23.5**	**21.0**
Department of Agriculture, Tabana Regency	**26.0**	**27.0**	**26.5**	**0.0**	**26.0**	**24.5**
Traditional Village	**25.0**	**26.0**	**23.5**	**26.0**	**0.0**	**20.5**
Subak Cooperative	**20.5**	**21.5**	**21.0**	**24.5**	**20.5**	**0.0**
Number Of	**121.0**	**125.0**	**119.0**	**130.0**	**121.0**	**108.0**

Convergences Degree Of Convergence (%)	**100.0**

Source: Primary Data Processed With Mactor, 2025

Table 6 shows the results of the analysis, the degree of convergence between farmer actors, the private sector, and traditional villages is classified as very high with a value reaching 100%. The three actors show a similarity of views on various strategic issues, with convergence scores between actors ranging from 20.5 to 26.0. This high level of alignment reflects the potential for strong cooperation and minimal conflict in joint decision-making.

Results of Actor Analysis Against Various Objectives

Table 7. Simple position matrix (1MAO)

1MAO	PP	PPK	MKP	MKPN	PK	MKPL	DB	MKL	MP	*Absolute Sum*
Farmer	1	1	1	1	0	1	1	1	1	8
Subak	1	1	1	1	0	1	1	1	1	8
Private Sector	1	1	1	1	1	1	1	1	1	9
Department of Agriculture, Tabana Regency	1	1	1	1	0	1	1	1	1	9
Traditional Village	1	1	1	1	1	1	1	1	1	8
Subak Cooperative	1	1	1	1	1	1	1	1	1	9
Number of agreements	6	6	6	6	3	6	6	6	6	
Number of disagreements	0	0	0	0	0	0	0	0	0	
Degree of mobilization	6	6	6	6	3	6	6	6	6	

Source: Primary Data Processed With Mactor, 2025

Description pp = Increased Income; PPK = Increased Productivity; MKP = Increased Community Welfare; Pk = Increased Loans/Credit; MPKL = Establishing Cooperation/Partnerships with Other Parties; DB = Can Interact, Learn, Communicate and Exchange Experiences; MKL = Support Environmental Sustainability; MP = Reduce the Impact of Environmental Pollution.

Based on Table 7, the results of the position convergence analysis, private sector actors show full alignment on all issues, while farmers and traditional villages have similar positions on 8 of the 9 issues. There is no disagreement between actors, indicating a very

high level of convergence or alignment. This reflects that the actors have relatively uniform views and support each other, thus potentially strengthening synergy in implementing joint policies or programs.

Table 8. Weighted position matrix (3MAO)

3MAO	PP	PPK	MKP	MKPN	PK	MKPL	DB	MKL	MP	*Mobilization*
Farmer	**7.1**	**7.1**	**7.1**	**7.1**	**0.0**	**3.6**	**5.3**	**3.6**	**3.6**	**44.4**
Subak	**3.2**	**2.1**	**4.2**	**4.2**	**0.0**	**2.1**	**4.2**	**4.2**	**4.2**	**28.6**
Private Sector	**3.1**	**3.1**	**1.5**	**2.3**	**0.8**	**3.1**	**2.3**	**0.8**	**0.8**	**17.7**
Department of Agriculture, Tabana Regency	**3.0**	**3.0**	**2.2**	**3.0**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**22.5**
Traditional Village	**2.6**	**1.8**	**2.6**	**2.6**	**0.0**	**2.6**	**2.6**	**3.5**	**3.5**	**22.0**
Subak Cooperative	**1.5**	**1.5**	**1.5**	**1.5**	**2.3**	**1.5**	**1.5**	**1.5**	**1.5**	**14.6**
Number of agreements	**20.5**	**18.6**	**19.3**	**20.8**	**5.3**	**15.2**	**18.3**	**15.9**	**15.9**	
Number of disagreements	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	
Degree of mobilization	**20.5**	**18.6**	**19.3**	**20.8**	**5.3**	**15.2**	**18.3**	**15.9**	**15.9**	

Source: Primary Data Processed With Mactor, 2025

Description pp = Increased Income; PPK = Increased Productivity; MKP = Increased Community Welfare; Pk = Increased Loans/Credit; MPKL = Establishing Cooperation/Partnerships with Other Parties; DB = Can Interact, Learn, Communicate and Exchange Experiences; MKL = Support Environmental Sustainability; MP = Reduce the Impact of Environmental Pollution.

Table 8 shows the mobilization of actors towards various objectives, it can be seen that farmer actors have the highest level of mobilization with a total score of 44.4, indicating that farmers are the most active and committed actors in encouraging the achievement of the objectives that have been set. Followed by the private sector with a mobilization score of 22.5, and DA with 22.0. These values reflect the intensity of the efforts or involvement of each actor in promoting relevant agendas. In addition, the data shows no disagreement between actors, indicating that all actors have a tendency to agree on the direction of the objectives to be achieved. The overall degree of mobilization shows that certain objectives receive greater attention, such as the Objective of increasing productivity and the Objective of improving farmer welfare,

which have the highest mobilization values (20.5 and 18.6), indicating a strong consensus and high priority on these issues in collaboration between actors.

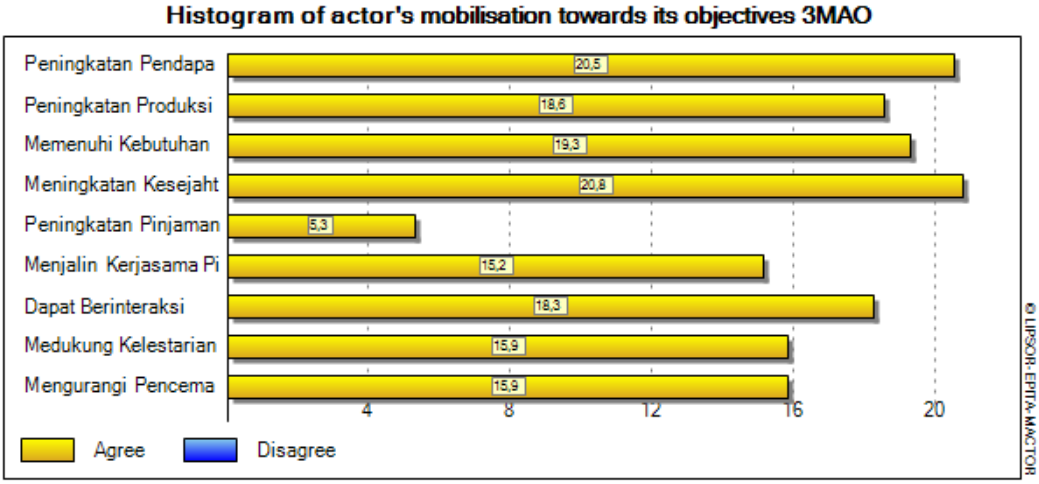

Figure 1. Histogram of actor mobilization towards its 3MAO goal

Source: Primary Data Processed With Mactor, 2025

Figure 1 histogram of actor mobilization towards objectives (3MAO), it can be seen that actors show a high level of mobilization towards several main objectives. The objective with the highest level of mobilization is Improving Welfare (20.8), followed by Increasing Income (20.5) and Meeting Needs (19.3), which reflects the priority of actors towards economic aspects and community welfare. In addition, the objective of Being Able to Interact and Establish Cooperation also obtained a high mobilization value (18.3 and 15.2), indicating the importance of communication and collaboration between actors. Meanwhile, Increasing Loans has the lowest level of mobilization (5.3), which indicates that the financing aspect has not been a main focus in the collective efforts of actors. Overall, this graph shows that actors are more focused on objectives that are directly related to improving the quality of life and synergy between stakeholders Bottom of Form

Discussion of Research Results

The Role of Stakeholders in Sustainable Farming Business

1. The Role of Farmers

Farmers are key actors and the main actors in the red rice farming system. They are directly involved in the entire production process, from land preparation, planting, maintenance, to harvesting. The results of the analysis show that farmers have the highest influence on other actors and low dependency. This makes farmers the dominant actors in the system, with a large capacity in determining the direction and dynamics of sustainability. Farmers also show a high level of convergence towards the objectives of

the system, reflecting the alignment of views in supporting sustainable agricultural practices.

This is in line with research which states thatSomkaun et al., (2021)Farmers are key actors in farming and the transformation into farmer entrepreneurs. Farmers are directly involved in the entire production and marketing process. Their success is supported by a social network involving families, community leaders, government, and the private sector.

2. The Role of Subak

Subak Jatiluwih has a strategic role as a manager of a traditional irrigation system and as a social institution that unites the farming community. Subak not only regulates water distribution, but also maintains cultural and spiritual values through the implementation of traditional rituals that are closely related to agriculture. In this system, Subak contributes to maintaining the balance between humans and nature, in accordance with the principles of Tri Hita Karana. The results of the analysis show that Subak has a moderate influence and a high level of harmony with other actors, indicating the importance of Subak's role in the social and ecological aspects of agriculture.

This is in line with research which states thatPuspitasari et al., (2024)Subak plays an important role in water management and cultural preservation. In addition to regulating the distribution of water fairly, Subak also carries out social and spiritual functions through traditional rituals and the principle of mutual cooperation. This system reflects harmony between humans, nature, and beliefs, and is recognized by UNESCO as a world cultural heritage.

3. Role of the Private Sector

The private sector, in this case represented by the Dharma Santika Regional Company, plays a role in supporting the marketing and distribution of red rice agricultural products. They are also involved in packaging, branding, and expanding market access to the tourism sector. With formal partnerships between the private sector, farmers, cooperatives, and traditional villages, the sustainability of farming businesses can be supported through a market-based economic approach. Although in a medium-influence position, the private sector strongly supports all system objectives with a fairly high mobilization value. This indicates that the contribution of the private sector is very important in creating added value and expanding product reach.

This is in line with research which states thatFerris et al., (2014)the private sector can engage in increasing levels of domestic and foreign direct investment to improve the local business environment and upgrade infrastructure, as well as to improve

communications and access to services, and strengthen demand through a more stable trade framework.

4. The Role of the Tabanan Regency Agriculture Service

As a representative of the local government, the Department of Agriculture has an important role in extension, farmer empowerment, and provision of infrastructure and supporting policies. This department is a bridge between central policies and implementation in the field, including in supporting organic farming practices and sustainable farming systems. In the results of the MACTOR analysis, the Department of Agriculture is in a moderate position of influence and shows full alignment with the objectives of the system. This shows that the role of government is very necessary to create a regulatory framework and technical support that is conducive to sustainable agriculture.

This is in line with research which states thatKamaraa et al., (2023)that Government institutions play a role in mobilizing farmers at the community level, providing training to farmer groups on the main techniques of the Rice Intensification System through various extension approaches, such as Farmer Field Schools and providing other inputs, such as rice seeds and equipment.

5. The Role of Traditional Villages

Jatiluwih Traditional Village plays an important role in maintaining spatial planning, cultural values, and the implementation of religious rituals related to agriculture. They also play a role in maintaining harmony between tourism and agricultural development, so that both run in harmony and do not interfere with each other. Although the analysis shows that traditional villages have low influence and high dependence, culturally, their role is very vital. Preserving local culture and values is an important aspect of social and spiritual sustainability in the Jatiluwih agricultural system.

This is in line with research which states thatNewspaper (2025)Traditional figures are the main actors in transmitting this knowledge through cultural activities, informal education, and the involvement of the younger generation. With this role, the Traditional Village not only maintains ecological and spiritual balance, but also strengthens the communal identity of the Balinese agrarian society.

6. The Role of Subak Cooperatives

Subak Cooperatives act as economic institutions that manage agricultural products, provide production facilities, and strengthen distribution systems. They also support farmer welfare through joint sales management and training in environmentally friendly cultivation. In the MACTOR system, cooperatives are in a fairly important position in supporting the sustainability of the local economy. They are actors who

bridge production and markets and strengthen farmers' bargaining position in the value chain.

This is in line with research which states thatFitriyani, (2024)with the existence of cooperatives, farmers can work together to buy fertilizers, seeds, and agricultural equipment. In addition, it is also important to pay attention to the sustainability aspect in managing agricultural products.

The Role of Stakeholders in Various Objectives

1. Increased Income

Increasing income is the main objective of the economic aspect. Based on the results of the MACTOR analysis, all stakeholders showed full support for this objective. Farmers, cooperatives, and the private sector play a major role in realizing it through increasing the selling value of red rice, product diversification, and market expansion. With the support of promotion and branding from the private sector and collective sales managed by cooperatives, farmers' income has increased significantly.

This is in line with research which states thatChrismawati & Pramono, (2021)stakeholders can develop economic activities based on local potential that aim to increase community income while maintaining agricultural land with integrated management.

2. Increased Productivity

This goal is related to increasing crop yields without damaging the environment. Farmers, the Department of Agriculture, and Subak are very active in achieving this goal. Extension of organic farming technology, training in cultivation techniques, and efficient irrigation management by Subak play a major role in maintaining productivity. Data shows that sustainable farming practices, although not as fast as intensive methods, are able to increase yields in an environmentally friendly way.

This is in line with research which states thatHeryadi et al., (2022)Stakeholders play a role in supporting the success of organic rice farming development both in terms of production process, post-harvest to marketing. Future hopes with increasing the amount of organic rice production and productivity so that efforts to fulfill the availability of healthy food and preservation of environmental functions can be realized.

3. Meeting Farmers' Needs

This objective includes meeting the basic needs of farmers such as access to seeds, organic fertilizers, agricultural tools, and markets. The Subak Cooperative and the Department of Agriculture contribute directly by providing agricultural input assistance and training. The analysis results show that stakeholders provide important values to this

objective. Collaboration between parties makes farmers not only dependent on external parties, but able to organize needs locally.

This is in line with research which states thatParistha et al., (2022)stakeholders provide facilities for all the needs of tourist villages by providing infrastructure, both facilities and infrastructure, and expanding various forms of facilities.

4. Improving Farmer Welfare

Farmers' welfare is not only determined by income, but also includes health, education, and quality of life. Traditional Villages and Subak, through a community-based approach, maintain the values of togetherness and mutual cooperation that support social welfare. Meanwhile, the private sector and cooperatives help economically. All stakeholders show high support for this goal, which shows an understanding that sustainable agriculture is not only about production but also the lives of farmers.

This is in line with research which states thatBerliandaldo et al., (2021)with collaboration with actors, it can increase labor absorption and economic growth, thereby increasing the welfare of society in general.

5. Increase in Loans/Credit

Access to loans/credit is important to support farming capital. In this context, Subak cooperatives and the private sector have an important role. Farmers get access to financing for production needs, especially in purchasing fertilizers, harvesting tools, or diversifying farming businesses. The Department of Agriculture also encourages assistance and subsidy schemes. Stakeholders agree that increasing access to credit supports the sustainability of farming businesses in terms of financing.

This is in line with research which states thatTanjung et al., (2020)local government programs related to assistance in the form of seed and fertilizer stock through farmer groups in the research area and assisting in accessing credit because it is an opportunity for farmers to cover capital shortages. So that production input needs can be maximized which will have an impact on the success of increasing agricultural production.

6. establish cooperation/partnerships with other parties

This objective highlights the importance of partnerships between farmers, government, the private sector and other institutions. Analysis shows that the private sector and cooperatives are important actors in bridging collaboration. Collaboration with the tourism sector, marketing institutions and the government has increased the efficiency of distribution and promotion. Stakeholders show very high convergence

towards this objective, proving that cross-sector collaboration is key to the success of sustainable agriculture.

This is in line with research which states thatGayatri, (2023)that collaboration between stakeholders is an important key in developing tourism villages, supported by individual, organizational and policy values, as well as good communication and trust between parties.

7. Can interact, learn, communicate and share experiences between farmers

This objective is related to the social dimension of sustainability, namely capacity building through interaction. Farmers, through Subak and cooperatives, often participate in training, farmer group discussions, and exchange of experiences. The Department of Agriculture encourages this interaction through extension and farmer forums. All stakeholders support the creation of a shared learning space, which shows that sustainability is also built from local knowledge and sharing of experiences between farmers.

This is in line with research which states thatNikoyan et al., (2020)the role of stakeholders as a means of exchanging farming experiences Farmer communities that are accommodated in one forum tend to be open to interaction and communication in developing their farming experiences.

8. Supporting Environmental Sustainability

This goal is closely related to reducing the use of chemicals and protecting local ecosystems. Organic farming practices, natural irrigation management by Subak, and the prohibition of land conversion by the Traditional Village are concrete forms of support for environmental conservation. Stakeholders such as farmers, Subak, and the Department of Agriculture have shown strong support for this goal. This implementation makes the Jatiluwih agricultural system not only productive but also environmentally friendly.

This is in line with research which states thatFatin et al., (2024)Actors play a role in environmental sustainability by reducing the amount of waste in the community, creating a clean and healthy environment and fostering community awareness of the importance of protecting and respecting the environment.

9. Reducing Environmental Pollution in a Sustainable Manner

Pollution reduction is done by avoiding the use of chemical pesticides and synthetic fertilizers. Cooperatives and agricultural services encourage the use of environmentally friendly inputs and conduct socialization about the negative impacts of

pollution on land and water. Stakeholders show a high level of understanding of the importance of this goal, because ecological sustainability is very important for the future of agriculture in this cultural heritage area.

This is in line with research which states that Widowati, (2019)stakeholders play a role in efforts to reduce pollution, manage industrial emissions through pollution control technology, with these efforts using air quality data, conducting environmental campaigns, and encouraging the use of air monitoring.

CONCLUSION

Based on the analysis results of this study, the following conclusions can be drawn:

1. The analysis indicates that farmers are the most dominant actors, characterized by high influence and low dependency, making them key players in the sustainability of red rice farming in Jatiluwih Village. Farmers possess significant capacity to direct and mobilize strategic agricultural goals, thus they should be the primary focus in policy and development initiatives. Meanwhile, other actors such as the Department of Agriculture, the private sector, and customary village institutions also play roles, albeit with lower influence and higher dependency.
2. The analysis also reveals a high level of convergence among stakeholders, indicating the absence of significant conflict in their views on the direction of farming sustainability. Objectives such as improving farmer welfare, enhancing productivity, and meeting farmers' needs receive the strongest support, reflecting alignment and a collaborative spirit. Conversely, issues related to access to loans and financing receive less attention, suggesting the need for stronger support as part of a comprehensive sustainability effort.

REFERENCES

Abdurrozzaq Hasibuan, Suhela Putri Nasution, Fitri Amja Yani, Henni Adlini Hasibuan, & Nyak Firzah. (2022). Strategi Peningkatan Usaha Tani Padi Sawah Untuk Meningkatkan Perekonomian Masyarakat Desa. *Abdikan: Jurnal Pengabdian Masyarakat Bidang Sains Dan Teknologi*, *1*(4), 477–490.

Adnyana, I. M. D. M. (2021). Populasi Dan Sampel. *Metode Penelitian Pendekatan Kuantitatif*, *14*(1), 103–116.

Anglila Amaral, N. P., Kirana Pratiwi, L. P., & Ni Putu, S. (2023). Peranan Kelompok Tani Dalam Pengembangan Pertanian Berbasis Organik. *Media Agribisnis*, *7*(2), 49–58.

Ariyani, N., Fauzi, A., & Umar, F. (2020). Model Hubungan Aktor Pemangku Kepentingan Dalam Pengembangan Potensi Pariwisata Kedung Ombo. *Jurnal Ekonomi Dan Bisnis*, *23*(2), 357–378.

Badan Pusat Statistik. (2024). Pertumbuhan Ekonomi Indonesia Triwulan Iv-2019. *Www.Bps.Go.Id*, *17/02/Th. Xxiv*, 1–12.

Badan Pusat Statistik Provinsi Bali. (2024). Produk Domestik Regional Bruota Provinsi Bali. *Www.Bps.Go.Id*, *11*(1), 1–14.

Berliandaldo, M., Chodiq, A., & Fryantoni, D. (2021). Kolaborasi Dan Sinergitas Antar *Stakeholder* Dalam Pembangunan Berkelanjutan Sektor Pariwisata Di Kebun Raya Cibinong. *Inobis: Jurnal Inovasi Bisnis Dan Manajemen Indonesia*, *4*(2), 221–234.

Charles Christover Mamahit, Nordy L. F. Waney, Dan J. R. M. (2021). Pandangan Pemangku Kepentingan Terhadap Usahatani Berkelanju- Kabupaten Minahasa Selatan (The View Of *Stakeholder*s On Sustainable Highland Vegetable Agribusiness In Sinisir Village , Modoinding Sub District , South Minahasa Regency) Charles Christover M. *Agrirud*, *3*, 296-306 1).

Chrismawati, Y., & Pramono, R. W. D. (2021). Pemetaan *Stakeholder* Yang Berperan Dalam Pengembangan Agrowisata Minapadi Samberembe. *Jurnal Riset Pembangunan*, *4*(1), 26–46.

Dadi, D. (2021). Pembangunan Pertanian Dan Sistem Pertanian Organik. *Jurnal Education And Development*, *9*(3), 566–572.

Dolly, F. I., Purnaweni, H., Kismartini, K., & Susanti As, M. (2022). Peranan *Stakeholder*s Ii Kabupaten Bungo, Jambi Dalam Pencegahan Praktek Alih Fungsi Lahan Pertanian Ke Non-Pertanian: Tinjauan Dari Perspektif Governance. *Jurnal Ilmiah Tata Sejuta Stia Mataram*, *8*(1), 45–55.

Fatin, A. D., Devina, F., & Musleh, M. (2024). Kolaborasi *Stakeholder* Dalam Pengembangan Pariwisata Berkelanjutan Di Desa Wisata Pandean Kecamatan Dongko Kabupaten Trenggalek. *Jurnal Administrasi Publik*, *15*(1), 28–47.

Ferris, S., Robbins, P., Best, R., Seville, D., Buxton, A., Shriver, J., & Wei, E. (2014). Linking Smallholder Farmers To Markets And The Implications For Extension And Advisory Services - Meas Discussion Paper Series On Good Practices And Best Fit Approaches In Extension And Advisory Service Provision. *Meas Brief*, *4*(10), 1–46. Www.Meas-Extension.Org

Fitriyani, F. (2024). *Penguatan Pengelolaan Hasil Pertanian Melalui Koperasi Pada Kelompok Tani Tamiang Kecamatan Gunung Kaler Tangerang*. *8*(September), 2831–2839.

Gai, A. M., Witjaksono, A., & Maulida, R. R. (2020). *Perencanaan Dan Pengembangan Desa*.

Gayatri, N. A. P. (2023). Analisis Peran. *Journal Of Public Policy And Management Review*, *13*(1). File:///C:/Users/Lenovo/Downloads/Tesisjamalkarokaro.Pdf

Gita Srihidayati, & Suhaeni. (2022). Analisis Pengaruh Sektor Pertanian Terhadap Pertumbuhan Ekonomi. *Wanatani*, *2*(1), 21–26.

Heryadi, D. Y., Noor, T. I., Deliana, Y., & Hamdani, J. S. (2022). Model Implementatif Agribisnis Padi Organik Berkelanjutan Melalui Pendekatan Pentahelix. *Jurnal Agribest*, *6*(1), 1–10.

I Ketut Wartayasa. (2025). *Astrologi Hindu Dalam Dinamika Budaya Pertanian Subak : Studi Etnografi Di Kabupaten Tabanan*. *9*, 166–176.

Journal, C. D., Heriyanto, M., Ikhsan, M., Rifai, A., Fermi, M. I., Vani, R. V., & Pelalawan, K. (2024). *Eskalasi Agricultural Cooperatives : Pemberdayaan Usahatani Perkebunan Kelapa Sawit Bagi Petani*. *6*, 12237–12245.

Junior, M. P., & Wenagama, I. W. (2020). Analysis Of Factors Affecting Seaweed Farming Income Toyapakeh Village Nusa Penida Klungkung Regency. *E-Jurnal Ekonomi Pembangunan Universitas Udayana*, *10*(6), 2427–2454.

Kantohe, C., Sondakh, M. F. L., & Benu, N. M. (2023). *Analisis Faktor – Faktor Yang Mempengaruhi Keberlanjutan Usahatani Rumput Laut Di Desa Kaliuda Kabupaten Sumba Timur*. *11*(1), 330–335.

Lamin Ibrahimkamaraa, Baqir Lalani, & Peter Dorward. (2023). Towards Agricultural Innovation Systems: Actors, Roles, Linkages And Constraints In The System Of Rice Intensification (Sri) In Sierra Leone. *Y Elsevier B.V. On Behalf Of African Institute Of Mathematical Sciences*.

Leni, N. E., Widianingsih, I., & Ismanto, S. U. (2021). Analisis *Stakeholder*s Dalam Tata Kelola Air Untuk Pertanian (Studi Pada Tata Kelola Air Untuk Pertanian Kewenangan Pusat Di Sumatera Barat). *Responsive*, *4*(3), 135.

Ni Kadek Widyawati, & Sukadana, I. W. (2021). *Pemanfaatan Dana Keuangan Subak Untuk Meningkatkan Produktivitas Pertanian Di Desa Lembean Bangli*. *7*, 196–202.

Nikoyan, A., Kasim, S., Uslinawaty, Z., & Yani, R. (2020). Peran Dan Manfaat Kelembagaan Kelompok Tani Pelestari Hutan Dalam Pengelolaan Taman Hutan Raya Nipa-Nipa. *Perennial*, *16*(1), 34–39.

Parah, G. C., & Nauly, D. (2022). *Analisis Pendapatan Usahatani Beras Merah Organik Studi Kasus Di Kelompok Tani Sarinah Bandung*. *6*, 1182–1191.

Paristha, N. P. T., Arida, I. N. S., & Bhaskara, G. I. (2022). Peran *Stakeholder* Dalam Pengembangan Desa Wisata Kerta Kecamatan Payangan Kabupaten Gianyar. *Jurnal Master Pariwisata (Jumpa)*, *8*, 625.

Prapnuwanti, N. P. I., & Sudiana, I. K. (2019). Pengaruh Modal, Tenaga Kerja, Luas Lahan Dan Teknologi Terhadap Produktivitas Dan Pendapatan Petani Beras Merah. *E-Jurnal Ekonomi Pembangunan Universitas Udayana*, *10*(5), 2040–2069.

Prasiasa, D. P. O., Widari, D. A. D. S., & Utama, I. G. B. R. (2023). World Cultural Heritage Designated Impacts In Jatiluwih Agritourism, Bali, Indonesia. *International Journal Of Professional Business Review*, *8*(6), E02196.

Pratiwi, I. A. M., Anandari, I. G. A. A. A., & Saskara, I. A. G. D. (2023). *Analisis Sektor Unggulan Dan Potensi Ekonomi Di Provinsi Bali Pasca Pandemi Covid-19*. *12*(05), 924–942.

Puspitasari, A., Rangga, M., Wicaksono, T. P., & Luerdi, L. (2024). Indonesia's Cultural Diplomacy In Introducing Subak And Spice Routes At World Water Forum 2024 (Diplomasi Budaya Indonesia Dalam Memperkenalkan Subak Dan Jalur Rempah Di Forum Air Dunia 2024). *Joels: Journal Of Election And Leadership*.

Putu Nina Eka Lestari, N., Kembar Sri Budhi, M., & Made Suidarma, I. (2019). The Role Of Subak As Culture Capital To Develop Community Based Tourism Village (Case Study In Pinge Village, Bali Province, Indonesia). *Scientific Papers Series Management, Economic Engineering In Agriculture And Rural Development*, *19*(3), 357–368.

Rachman, A. F., Prakoso, L. Y., Boediman, S., & Rianto. (2022). Invention Tradition On Subak Cultural Landscape World Heritage Site, Jatiluwih, Bali Island, Indonesia. *Cite:*

Baltic Journal Of Law & Politics, *15*(1), 1812–1828.

Rachmawati, R. R. (2021). Smart Farming 4.0 Untuk Mewujudkan Pertanian Indonesia Maju, Mandiri, Dan Modern. *Forum Penelitian Agro Ekonomi*, *38*(2), 137.

Salim Lubis, F., Rozen, N., & Efendi, S. (2021). Membangun Sinergi Antar Perguruan Tinggi Dan Industri Pertanian Dalam Rangka Implementasi Merdeka Belajar Kampus Merdeka. *Seminar Nasional Dalam Rangka Dies Natalis Ke-45 Uns Tahun 2021*, *5*(1), 245–252.

Siregar, F. Ahmad. (2023). Pengembangan Sistem Petanian Berkelanjutan Untuk Mencapai Keberlanjutan Pangan. *Jurnal Universitas Medan Area*, 1–11.

Somkaun, N., Chumnanmak, R., & Narongchai, W. (2021). The Roles Of *Stakeholder*s And Social Networks In Becoming Farmer-Entrepreneurs. *Journal Of Mekong Societies*, *17*(3), 121–147.

Suardike, P., & Prabawa, P. S. (2022). Kajian Pertanian Organik Dalam Upaya Menyusun Kebijakan Pembangunan Pertanian Yang Berkelanjutan Di Kabupaten Buleleng. *Jurnal Pertanian Agros*, *24*(3), 1156–1169.

Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif, Dan R&D. Alfabeta*.

Tanjung, A. F., Rini, I., & Lubis, S. N. (2020). Strategi Peningkatan Pendapatan Petani Padi Sawah Di Kabupaten Labuhan Batu. *Journal Of Agribusiness Sciences*, *3*(2), 59–63.

Tanjung, D., Selatan, T., Utara, S., Tanjung, D., Selatan, T., Utara, S., Siregar, A. Z., & Lubis, K. S. (2020). *Pemberdayaan Petani Dalam Meningkatkan Produktivitas Beras Merah Talenta Conference Series Pemberdayaan Petani Dalam Meningkatkan Produktivitas Beras Merah*. *3*(2).

Wardono, B., Muhartono, R., Hikmayani, Y., Apriliani, T., & Hikmah, H. (2019). Analisis Prospektif Peran Aktor Dalam Strategi Formulasi Pembangunan Perikanan Di Kabupaten Natuna. *Jurnal Sosial Ekonomi Kelautan Dan Perikanan*, *14*(2), 179.

Wendy Liana, S., M.Si, Kusumastuti, S. Y., Dr. Darwin Damanik, S. E., M.S.E, Dalizanolo Hulu, S.E., I., Crm., Crp, M.E., Dr. Ir. Apriyanto, S.E., S. P., M.M, Loso Judijanto, S.Si., M.M., I., M.Stat, Tono Wartono, S.E., M. ., Dr. Suharto, M. K., Dr. Ir. Fitriyana, S.Pi., M.Si., I., Dr. Hariyono, S.Pd., M. ., & Jana Milia, S.Ip., M. H. (2024). *Pertumbuhan Ekonomi* (Sepriano (Ed.)). Pt. Sonpedia Publishing Indonesia.

Widowati, N. G. M. N. (2019). Peran *Stakeholder* Dalam Penurunan Polusi Udara Di Tangerang Selatan. *Sustainability (Switzerland)*, *11*(1), 1–14.

Yastini, Nengah Evi, & Yulianti. (2023). *Analisis Usahatani Beras Merah Di Subak Srinadi Desa Senganan Kecamatan Penebel Kabupaten Tabanan*. *13*(2), 91–100.