

The Future of the Conservation Province of West Papua in Supporting the Production of Basic Foodstuffs and Poverty Eradication

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Abstract: The West Papua Provincial Government in 2018 declared West Papua as a Province of Sustainable Development, which was reinforced by the enactment of Regional Regulation No. 10 of 2019. In its development, West Papua Province was then divided into two provinces, namely West Papua and West Papua South. With the enactment of the second revision of the Special Autonomy Law No. 2 of 2021, the threat of regional division has grown, including the shrinking of productive agricultural land in food-producing areas. The objectives of this study are to (1) examine the development of provincial conservation policies in West Papua; (2) explore the agenda for regional division accompanied by commitments to sustainable development in West Papua Province; and (3) analyze the production capacity of staple foods in West Papua Province. This research is a case study in which West Papua Province was deliberately selected. A descriptive method with a desk study approach was used as the data analysis method. The results of the study concluded that (1) the current West Papua Conservation Province policy is not running as it should; (2) the policy of forming new autonomous regions (DOB) has caused each cultural entity to focus on expanding itself and neglecting the sustainable development commitments initiated since 2015; and (3) the production of staple food commodities, particularly rice, in West Papua has experienced a drastic decline over the past five years, threatening local food security. West Papua is projected to face a rice deficit of 23.27 tons by 2025.

Keywords: Food production center; regional expansion; West Papua Conservation Province.

Introduction

West Papua Province was declared a Province of Sustainable Development, as reaffirmed by Regional Regulation No. 10 of 2019. West Papua Province was subsequently split into two provinces: West Papua and West Papua South. With the enactment of the second revision of the Special Autonomy Law No. 2 of 2021, the threat of regional division has grown, including the shrinking of productive agricultural land in food-producing regions.

Sustainable agricultural can be put in place using four different approaches, namely 1) organic farming system, 2) integrated farming system, 3) low external input farming system, and 4) integrated pest control system (Salikin, 2011; Mukhlis et al., 2023; Kaunang et al., 2024).

Integrated farming system (IFS) as a concept of farming system that combines two or more farms (Channabasavanna et al., 2009; Jayanthi et al., 2009; Ugwumba et al., 2010; Massinai, 2012; Walia & Kaur, 2013; Jaishankar et al., 2014) where there are input-output linkages between commodities and biological

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recycling processes (Prajitno, 2009; Changkid, 2013; Massinai, 2012; Thorat et al., 2015), which use low external inputs (Devendra, 2011; Nurcholis & Supangkat, 2011; Hilimire, 2011) and utilise resources efficiently (Bosede, 2010; Balemi, 2012 and Soputan, 2012), and apply various techniques so as to increase production, productivity and income of farmers and sustainably (Gupta et al., 2012; Manjunatha et al., 2014; Thorat et al., 2015; Mukhlis et al., 2024; Rasyid et al., 2024). The development of Integrated Farming Systems in Upland Areas is one of the efforts to improve the economic capacity of farmers.

In September 2000, the world entered a new era for a better life when 168 member countries of the United Nations agreed on the MDG program (*The Millennium Development Goals*). The global poverty rate has decreased by more than half since the MDG declaration. In September 2015, 193 UN member countries signed an agreement to continue the MDGs' achievements through a new approach called the SDGs (Sustainable Development Goals) for the transformation of the world towards sustainable development by 2030. Indonesia is one of the countries that signed the SDGs document entitled "Transforming Our World: The 2030 Agenda for Sustainable Development."

As a consequence, development agendas in the territory of the Republic of Indonesia, including West Papua, must align with the SDGs. The implementation of the SDGs in Indonesia is both a hope and a challenge.

Various problems have arisen in its implementation, including program synchronization and coordination between the central and regional governments, as well as stakeholder participation. The West Papua Provincial Government, for example, at the ICBE (International Conference on Biodiversity, Ecotourism, and Creative) in Manokwari in 2018, declared the concept of a Conservation Province as a new policy direction. Several reasons underpin this policy, including global climate change, biodiversity conservation, and the green economy as a new target. A study by 99 researchers from 19 countries confirmed the status of Papua Island as one of the mega biodiversity hotspots that need to be protected. Papua Island has 13,634 species of flora grouped into 1,742 genera and 264 families with an endemism rate of 68 percent. This study laid the foundation for the initiation of development ideas that prioritize a sustainable development approach in Papua. In the first point of the 2018 ICBE declaration in Manokwari, it was stated that the governments of Papua and West Papua provinces would allocate at least 70 percent of their land area as protected areas. This declaration marked the birth of a conservation commitment for West Papua Province.

Since 2021, starting with the enactment of Law No. 2 of 2021 amending Law No. 21 of 2001 on Special

Autonomy for the Province of Papua, regional division has posed a serious threat to the conservation goals declared four years prior. In 2022, West Papua was split into two provinces: West Papua and West Papua South. This division will be followed by the formation of several new autonomous regions (DOB) at the regency level, or in other words, the conversion or transfer of land use for the purpose of regional division is inevitable.

Regional division with the aim of shortening the span of government control has consequences in the form of population growth that threatens the availability of productive land as a factor in the production of staple foods for the population. The conversion of land for residential purposes, office areas, and other public services will reduce the ability to meet food needs independently. Signs of high-intensity land conversion are beginning to emerge in important food production centers in West Papua, particularly in Manokwari Regency. A study on land conversion in Udupi Hilir Village, which was designated as agricultural land through a transmigration program in 1982 with an initial area of 100 hectares, showed that only 44.5 hectares remained in 2021, with the possibility of further reduction.

During the COVID-19 pandemic in 2019, West Papua was among the provinces experiencing a food deficit, particularly in rice, corn, sugar, red onions, garlic, and chicken eggs. At that time, West Papua's rice production was 29,935 tons, while the demand reached 59,246.7 tons, resulting in a deficit of 29,311.19 tons (49.47%). This deficit was supplied from outside Papua Island, primarily from Java and South Sulawesi. The food security situation in West Papua Province during the COVID-19 pandemic reflected the fragility of food stocks in the region, especially since the Sorong Raya area had not yet been separated into a separate province at that time. This study aims to estimate the capacity of West Papua Province to prepare food security, particularly rice, following its division into two provinces, and the possibility of further division into several new autonomous regions (DOB).

Method

Research Location and Time

The research location was deliberately chosen by selecting West Papua Province as a case study. This research took place over a period of one month from June to July 2025. West Papua is one of six provinces located on the island of Papua, and is geographically located at 0° - 40° South Latitude and 124° - 132° East Longitude. The analysis unit is limited to West Papua Province, which includes seven districts: Manokwari,

Fakfak, Teluk Wondama, Teluk Bintuni, Kaimana, Pegunungan Arfak, and South Manokwari.

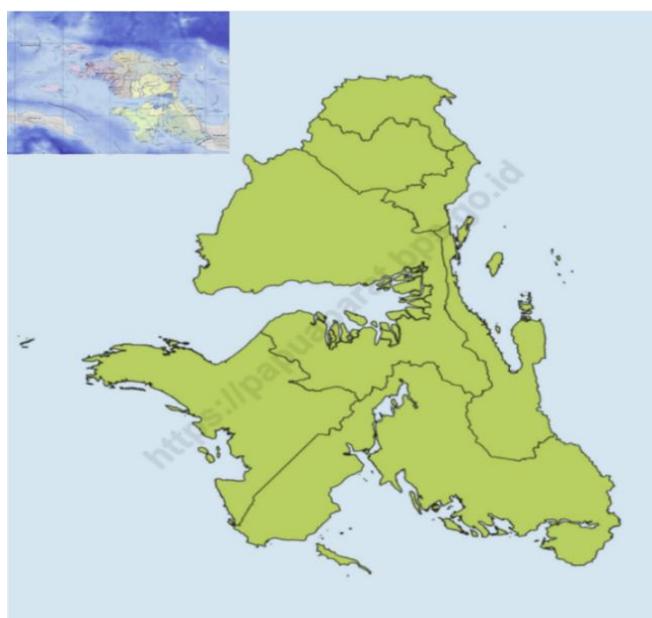


Figure 1. Map of West Papua Province, 2024

Data Analysis Methods

As a descriptive study, this research aims to describe and illustrate the reality of food security and threats to the environment in West Papua as it is. In collecting data, a desk study and library research approach was used because the data was collected from various online sources in the form of articles, documents, books, and official government publications. Official publication sources from government agencies primarily include the Central Statistics Agency (BPS), the Ministry of Agriculture (Deptan RI), and the Ministry of Forestry and Environmental Affairs (DKLH RI), as well as other official institutions. The data were then analyzed descriptively and presented in the form of frequency tables, graphs, and diagrams to facilitate readers' understanding of the observed cases. The stages of this research were adopted and modified from the model used by Durst & Edvardson, consisting of the following stages: (a) collecting online data (BPS, KLH, Kementan & the latest publications from 2015 to 2025 through Mendely Engine), (b) selecting data and articles relevant to the research topic, (c) processing and presenting data in descriptive form, and (d) analyzing and narrating trends and patterns in the data.

Result and Discussion

Development of West Papua Conservation Province Policy

The policy of West Papua as a conservation province has undergone a long journey, through

discussions and various approaches, involving many parties. Several institutions initiated the conservation province policy, both government and non-government, namely BAPEDALDA, West Papua Provincial DPRD, Unipa, WWF, CII, and TNC.

The initiation process began in 2009-2010 and was introduced in 2015. It was not until 2019 that West Papua was designated as a conservation/sustainable development province based on West Papua Provincial Regulation No. 10 of 2019 concerning Sustainable Development in West Papua Province. The development of provincial conservation policies, from the initial stage to the enactment of the Papua Provincial Regulation, is divided into three periods: Period I (2009–2015), known as the Initiation and Declaration Period; Period II (2016–2017), known as the Legalization and Dynamics Period; and Period III (2018–2020), known as the Consolidation and Regulation Enactment Period.

The significant efforts of the local government, all key stakeholders, and the people of West Papua to declare a provincial conservation policy in accordance with Regional Regulation No. 10 of 2019 are driven by the commitment to promote sustainable development as a development goal, ensure the survival of the indigenous people of Papua on their own land, improving the standard of living of the community through wise management of natural resources, and operationalizing Article 64(2) of Law No. 21 of 2001 as amended by Law No. 35 of 2008 on Special Autonomy for the Province of Papua. The objectives of sustainable development in West Papua Province are further elaborated in Article 4 of Regional Regulation No. 10 of 2019, which consists of nine objectives. Warami further explained that the designation of West Papua as a conservation province has 11 objectives, one of which is to ensure that development in West Papua is carried out in accordance with the carrying capacity and environmental capacity of the region.

Since its designation as a conservation province, the West Papua government has committed to allocating at least 70% of its land area as protected areas. In reality, in the establishment of the West Papua Provincial Spatial Plan (RTRWP) for the period 2013-2033, only 34% of the land area was allocated for protected areas, according to Ardiansyah et al. Syartinilia further used the ESA (Environmental Sensitive Area) model to propose the need to revise the spatial pattern of West Papua Province to maintain a minimum of 70% as protected areas, with 76.89% (7,608,648.11 ha) as protected areas and 23.11% (2,286,916.48 ha) as cultivation areas. This proposal has not yet been implemented in the form of a revision of the West Papua Regional Spatial Plan (RTRW) for the 2013-2033 period.

Agenda for Regional Expansion and Commitment to Sustainable Development

The implementation of the sustainable development agenda in West Papua Province, which was promoted through the establishment of conservation provinces, has never been comprehensively evaluated in terms of the size of protected areas and other designations for their use. The sustainable development agenda, as a commitment prior to the division into West Papua Province and West Papua Province, covers an area of 102,946.25 km², comprising 13 regencies and 1 municipality. This study will provide an overview of the strength of the commitment to sustainable development that has been built through a long struggle.

The period after the division of the West Papua Province, consisting of Fakfak, Kaimana, Teluk Wondama, Teluk Bintuni, Manokwari, South Manokwari, and Pegunungan Arfak districts, was reduced to 64,125.66 km², or 37.71% of the original area. The regencies of Bintuni Bay, Kaimana, and Tambrauw previously contributed the largest protected area in West Papua, spanning over 1 million hectares of natural forest. Bintuni Bay, Kaimana, and Fakfak account for 80.16% of the current area outside the province of West Papua. The potential area of West Papua Province will significantly decrease if the proposal to establish the Central West Papua Province (DOB) includes the traditional territory of Bomberay, encompassing four regencies: Teluk Bintuni, Kaimana, Fakfak, and Wondama. This would reduce the area of West Papua Province by 86.32%. This proposal has been widely reported in various online media (Metaradar Indonesia, April 12, 2025).

The discourse on dividing the province into new autonomous regions (DOB) at the regency level gained significant momentum after the enactment of Law No. 2 of 2021 on the Second Amendment to Law No. 21 of 2001 on Special Autonomy for the Province of Papua. This policy violates the moratorium issued by the government itself. To date, the government has not established clear regulations governing the implementation of regional autonomy, including criteria for when a region is eligible for division, such as fiscal capacity, economic capacity, administrative readiness, and infrastructure, which are considered inadequate, leading to the region being reintegrated into its parent region. The moratorium, which was widely publicized, applies to other regions in Indonesia except Papua. This was stated by former President Ma'ruf Amin in the past and later criticized by many parties, including Yoel Luiz Mulait as Deputy Chairman of the MRP Papua (Kompas, March 22, 2022). The government has deliberately used top-down power to push for regional expansion across the entire island of Papua, including West Papua. This

policy poses a serious threat to the sustainable development agenda planned as a strategic development program in West Papua Province.

Sustainable development itself has become an important issue after being established by the United Nations as a global agenda since 2016 under the name *Sustainable Development Goals* (SDGs). The status of sustainable development in the 33 provinces of Indonesia varies, but they are categorized into six clusters based on their development characteristics. The provinces of Papua and West Papua fall into the cluster of provinces prioritizing social and economic development, and therefore should adopt the SDGs scenario as a solution. It is no secret that one of the SDGs goals still facing challenges in West Papua is poverty. As of 2022, poverty rates in the provinces of Papua and West Papua remain high compared to other regions in Indonesia (Setiawan & Zahra, 2023).

Sustainable development is measured through the achievement of 17 SDG indicators implemented across all regions of Indonesia. Table 1 shows PBS data from the National Socio-Economic Survey (Susenas) on consumption and expenditure over the past four years, illustrating the level of SDG achievement in West Papua Province and West Papua South Province. In 2023, the SDG indicator for the poor living below the national poverty line averaged 25.61% in West Papua Province, higher than the same figure in West Papua Province at 23.66%.

Table 1. SDG Indicator Performance, Percentage of Population Living Below the National Poverty Line in West Papua Province, 2025.

Region	SDG Indicator Achievements (%)			
	2019	2020	2021	2022
Fakfak	23.25	22.27	22.86	22.06
Kaimana	16.11	15.5	16.04	15.29
Wondama Bay	32.42	30.91	31.61	30.06
Bintuni Bay	30.57	29.39	29.79	29.73
Manokwari	21.06	20.14	20.56	19.9
South Manokwari	29.94	28.88	29.3	28.55
Arfak Mountains	34.83	33.81	34.7	33.71
National Lower Target	8.50	9.70	9.50	8.50
National Upper Target	9.50	10.20	10.10	9.00

The SDG target for national poverty eradication is between 8.50 and 9.00 percent, which is quite a long way off for West Papua Province. In West Papua, only Kaimana Regency has shown a slightly more consistent decline in the percentage of poor people than other regencies, comparable to Sosong City in West Papua Province. The West Papua BPS published a report on its official website reporting a fantastic decline in poverty rates in West Papua. The key question is whether the decline in the poverty rate in West Papua is

accompanied by improvements in living standards or merely a statistical figure. The National Development Planning Agency (Bappenas) report (2025) on the performance of SDG development in Indonesia, focusing on several macro indicators in West Papua, notes an improvement in the Human Development Index (HDI) from 66.84% in 2023 to 67.69% in 2024, while the open unemployment rate decreased from 5.53% to 4.13%, significantly impacting economic growth, which surged from 5.18% to 20.80%. An anomaly occurred in the poverty rate (P0), which increased from 20.49% to 21.09%, in line with the widening economic disparity, with the Gini index rising from 0.37% to 0.39%. This situation suggests that the Regional Regulation on West Papua as a province of sustainable development has not been implemented.

Analysis of Food Production Capacity in West Papua Province

This study examines the relevance between the strong determination to promote sustainable development against national policies in the form of

regional expansion, while food production independence is an impact that will become the next potential problem. Previous studies have highlighted the region's capacity to meet local food needs in West Papua. During the period 2011-2015, when West Papua Province had not yet been divided, at least three food commodities experienced increased production, namely rice, sweet potatoes, and soybeans, while cassava, corn, vegetables, and peanuts remained fluctuating. Manokwari Regency serves as the production center for rice, potatoes, soybeans, and vegetables, while Sorong Regency primarily produces corn and green beans. Only these two regencies achieved a food surplus, while others were unable to meet local demand. Rice production remains suboptimal, prompting the West Papua Agricultural Research and Development Agency (Balitbangtan) to introduce the use of new high-yielding varieties (VUB) of rice, known as "amphibious rice," which can adapt to climate change. Field trials in the iPrafi lowlands successfully increased productivity by 2.8 tons per hectare.

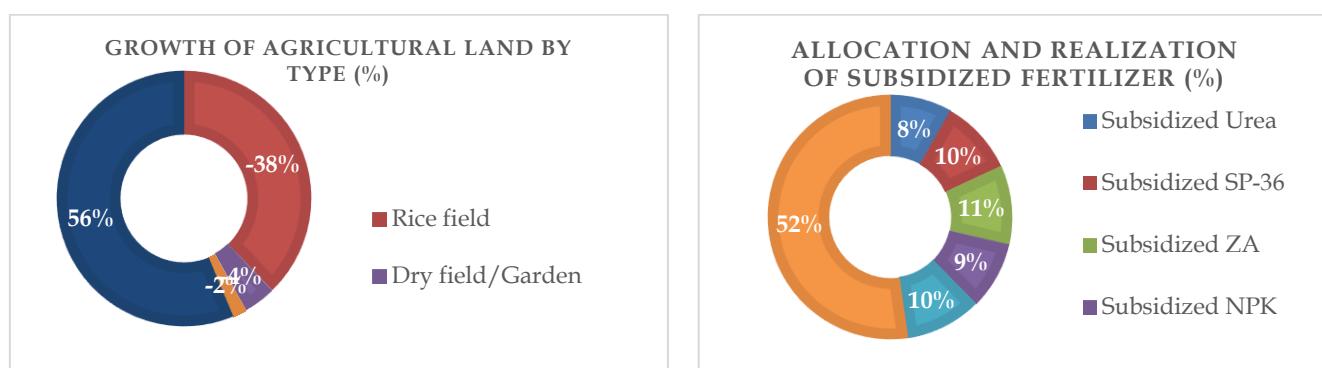


Figure 3. Growth of Agricultural Land by Type, Allocation, and Realization of Subsidized Fertilizer Distribution in West Papua Province in 2021-2022.

Source: Ministry of Agriculture of the Republic of Indonesia, 2025

The area of agricultural land in West Papua that is not utilized for production activities has increased from 2019 to 2023. The use of rice fields has decreased drastically by 70.61%, while dry fields/gardens decreased by 7% and the smallest decrease was in fields/humas at 3.41%. Uncultivated land, on the other hand, increased by 56%, meaning that productive land left idle exceeds the total productive land. The government has also provided incentives in the form of subsidized fertilizer distribution, with allocation and realization percentages shown in Figure 3. Subsidized NPK fertilizer with a special formula was distributed more than other types (Ministry of Agriculture, 2024). It appears that farmers are losing their enthusiasm to return to their land.

Data from the Indonesian Ministry of Agriculture's Data Center (Pusdatin) reports that rice production in

West Papua has continued to decline since 2019-2024, despite fairly good productivity. This decline has been influenced by a decrease in the area of land used for rice cultivation (Table 2).

Table 2. Area, Production, and Productivity of Rice in West Papua Province

Year	Area (Ha)	Production (ton)	Productivity (Ku/Ha)
2019	7,192.15	29,943.56	41.63
2020	7,570.63	24,378.33	32.2
2021	6,414.94	26,926.93	41.98
2022	5,460.59	23,963.92	43.89
2023	5,006.27	22,566.81	-
2024	5,121.13	20,729.15	-

The continuing decline in land area signals that the conversion of agricultural land in West Papua poses a

serious threat to the ability to meet local food needs. Rice is used as an indicator of food availability because its existence as a staple food has displaced local staple foods such as sweet potatoes, cassava, taro, and bananas. The current population of West Papua is 587,645, with an

assumption that 75% of the population lacks access to productive land, as most of the land is customary land (adat) controlled by the Indigenous Papuan People (OAP). This leaves 440,734 people dependent on rice production.

Table 3. Rice Demand Forecast in West Papua in 2025

District Population (people)	Penduduk (person)	Assumption 75% Population (people)	GKG Rice Production 2024 (tons)	Rice Demand (tons/year)	Rice Deficit (tons)
Fak-Fak	91,441	68,581	45.26	5,646	-5,617.17
Kaimana	67,795	50,846	-	4,186	-4,185.66
Teluk Wondama	46,595	34,946	62.29	2,877	-2,837.69
Teluk Bintuni	92,009	69,007	850.34	5,681	-5,147.13
Manokwari	208,021	156,016	14,458.08	12,843	-3,772.22
Manokwari Selatan	39,571	29,678	5,313.18	2,443	890.38
Pegunungan Arfak	42,213	31,660	-	2,606	-2,606.23
Papua Barat	587,645	440,734	20,729.15	36,281	-23,275.73

Source: (BPS, 2025)

The population dependent on rice is spread across urban areas and buffer zones, while the vast land controlled by OAP as local farmers is used as fields for growing cassava, bananas, and horticultural crops. The conversion of GKG rice into rice according to its conversion rate of 62.74% is used to calculate rice requirements. Each person requires 6.86 kg of rice per month, enabling the annual requirement to be calculated. All districts in West Papua are unable to meet their own rice needs except for South Manokwari District. The rice production center in South Manokwari is located in Oransbari District, which is a transmigration area. Overall, West Papua Province cannot meet its basic food needs, particularly rice, with a deficit of 23.27 tons projected for 2025. Rice is used as a general indicator for all food commodities in West Papua, assuming that if rice—a national priority—is in such a concerning condition, then the production of other food commodities is likely even lower.

Conclusion

Based on the results and discussion, the conclusions of this study are as follows: 1) The current conservation policy of West Papua Province is not being implemented as intended, 2). The policy of establishing new autonomous regions (DOB) has caused each cultural entity to focus on expanding itself and neglecting the sustainable development commitments initiated since 2015, 3). The production of staple food crops, particularly rice, in West Papua has experienced a drastic decline over the past five years, threatening local food security. West Papua is projected to face a rice deficit of 23.27 tons by 2025. Based on the results and discussion, several recommendations are made, including: 1). Further research is needed to delve deeper

into the sustainable development commitments established as regional regulations, 2). Additional research is required to examine spatial changes in the extent of productive agricultural land.

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Author Contributions

O.A.F.: Developing ideas, analyzing, writing, reviewing, responding to reviewers' comments; Y.P.: analyzing data, overseeing data collection, reviewing scripts, and writing.

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Conflicts of Interest

The authors declare no conflict of interest.

References

Amirya, M., & Irianto, G. (2023). Tantangan Implementasi Sustainable Development Goals (SGDs) Di Indonesia. *Jurnal Ilmiah Akuntansi Peradaban*, 9(1). <https://doi.org/10.24252/jiap.v9i1.38916>

[BPS], P. B. (2025). Provinsi Papua Barat dalam Angka. In *Etika Jurnalisme Pada Koran Kuning : Sebuah Studi Mengenai Koran Lampu Hijau*. Badan Pusat Statistik Provinsi Papua Barat.

Afisa, A., Habibullah, A., Khairiyah, M., & Widodo, A. S. (2024). Analysis of Pros and Cons of New Province Expansion in Papua. *Humanus*, 23(2), 226. <https://doi.org/10.24036/humanus.v23i2.124397>

Changkid, N. (2013). The Factors Production Use Efficiency in the Integrated Farming in Suratthani

Province, Southern Thailand. *Procedia-Social and Behavioral Sciences*, 91, 376-384. doi: 10.1016/j.sbspro.2013.08.434

Channabasavanna, A. S., Biradar, D. P., Prabhudev, K. N., & Hegde, M. (2009). Development of profitable integrated farming system model for small and medium farmers of Tungabhadra project area of Karnataka. *Karnataka J. Agric. Sci*, 22(1), 25-27.

Devendra, C. (2011). Integrated tree crops-ruminants systems in South East Asia: Advances in productivity enhancement and environmental sustainability. *Asian-Australasian Journal of Animal Sciences*, 24(5), 587-602. <https://doi.org/10.5713/ajas.2011.r.07>

Gultom, O. B., Ginting, B., Lubis, M. Y., Azwar, T. K. D., & Pasaribu, M. P. J. (2021). Repercussions of agricultural land conversion policy on food security in Indonesia. *IOP Conference Series: Earth and Environmental Science*, 782(3), 32054. doi:10.1088/1755-1315/782/3/032054

Gupta, V., Rai, P. K., & Risam, K. S. (2012). Integrated crop-livestock farming systems: A strategy for resource conservation and environmental sustainability. *Indian Research Journal of Extension Education, Special Issue*, 2, 49-54. <https://api.seea.org.in/uploads/pdf/v12514.pdf>

Hilimire, K. (2011). Integrated crop/livestock agriculture in the United States: A review. *Journal of Sustainable Agriculture*, 35(4), 376-393. <https://doi.org/10.1080/10440046.2011.562042>

Jaishankar, N., Janagoudar, B. S., Kalmath, B., Naik, V. P., & Siddayya, S. (2014). Integrated farming for sustainable agriculture and livelihood security to rural poor. *Int'l Conference on Chemical, Biological, and Environmental Sciences (ICCBES'14) May*, 12-13. <http://dx.doi.org/10.17758/IAAST.A0514013>

Jayanthi, C., Vennila, C., Nalini, K., & Chandrasekaran, B. (2009). Sustainable integrated management of crop with allied enterprises. *Sustainable Agriculture*, 21-27. https://citeseerx.ist.psu.edu/document?repid=re_p1&type=pdf&doi=58faa81dcf1cd70079e6e843ad912af9012c9446

Kaunang, R., Taroreh, M. L. G., Ngangi, C. R., & Mukhlis, M. (2024). Analysis of Coconut Agribusiness Development Strategy in North Minahasa Regency. *Jurnal Penelitian Pendidikan IPA*, 10(7), 4212-4219. <https://doi.org/10.29303/jppipa.v10i7.8500>

Khusun, H., Februhartanty, J., & Mognard, E. (2023). *Barometer* (Issue April). https://www.researchgate.net/publication/370654217_Indonesian_Food_Barometer

Manjunatha, S. ., Shivarthy, D., Satyareddi, S. A., Nagaraj, M., & Basavesha, K. (2014). Research and Reviews: Journal of Agriculture and Allied Sciences Integrated Farming System - An Holistic Approach: A Review . *Journal of Agriculture and Allied Sciences*, 3(4), 30-38.

Massinai, R. (2012). *Pengembangan Model Agroindustri Berbasis Sistem Usahatani Terpadu*.

Mukhlis, M., Hendriani, R., Sari, N., Wisra, R. F., Fitrianti, S., & Lutfi, U. M. (2023). *Analisis Pendapatan Petani Model Usahatani Terpadu Jagung-Sapi Di Kecamatan Payakumbuh*. <http://repository.pppn.ac.id/1951/1/History%20Publikasi%20Artikel%20JPPT%20vol.23%20no.2%20Juni%202023%20plus%20artikel%20yang%20sudah%20publish.pdf>

Mukhlis, M., Ismawati, I., Sillia, N., Fitrianti, S., Ukrita, I., Wisra, R. F., Raflis, H., Hendriani, R., Hanum, L., & Ibrahim, H. (2024). Characteristics of Production Factors and Production of Zero Tillage System Rice Farming. *Jurnal Penelitian Pendidikan IPA*, 10(8), 6013-6019. <https://doi.org/10.29303/jppipa.v10i8.8542>

Muzzakar, K., Syahnur, S., & Abrar, M. (2023). Provincial Real Economic Growth in Indonesia: Investigating Key Factors Through Spatial Analysis. *Ekonomikalia Journal of Economics*, 1(2), 40-50. <https://doi.org/10.60084/eje.v1i2.66>

Nurcholis, M., & Supangkat, G. (2011). Pengembangan integrated farming system untuk pengendalian alih fungsi lahan pertanian. *Prosiding Seminar Nasional Budidaya Pertanian, Urgensi Dan Strategi Pengendalian Alih Fungsi Lahan Pertanian*, 71-84. <https://repository.ums.ac.id/bitstream/handle/123456789/29649/B.7-Gatot%20S.pdf?sequence=1>

Pentury, M. A. (2023). The determinants of poverty in the West Papua province. *Jurnal Ekonomi & Studi Pembangunan*, 24(2), 285-296. <https://doi.org/10.18196/jesp.v24i2.18428>

Pertiwi, M. S. (2023). Sustainable Development Goals (SDGs) Dan Perwujudan Perdamaian Di Dunia. *Focus : Jurnal Pekerjaan Sosial*, 6(1). <https://doi.org/10.24198/focus.v6i1.34104>

Petrus A Dimara, & Amilda Auri. (2023). Analisis Perubahan Penutupan Lahan di Kabupaten Manokwari Selatan Provinsi Papua Barat. *Jurnal Kehutanan Papua*, 9(1), 50-60. <https://doi.org/10.46703/jurnalpapua.vol9.iss1.428>

Prajitno, D. (2009). Sistem Usahatani Terpadu Sebagai Model Pembangunan Pertanian Berkelanjutan di Tingkat Petani. *Pidato Penyuluhhan Jabatan Guru Besar Pada Fakultas Pertanian UGM*.

Rasyid, I., Wirawan, I., Sirajuddin, S. N., & Mukhlis, M. (2024). Accessibility of Sustainable Beef Cattle Business Development in Mattiro Bulu District, Pinrang Regency. *Jurnal Penelitian Pendidikan IPA*, 813

10(10), 7688-7695.
<https://doi.org/10.29303/jppipa.v10i10.9083>

Salikin, K. (2011). *Sistem Pertanian Berkelaanjutan* (6th ed.). Penerbit Kanisius.

Thorat, B. N., Thombre, B. M., & Dadge, A. V. (2015). *B. N. Thorat*, B. M. Thombre and A. V. Dadge.* 33(2), 653-657.

Ugwumba, C. O. A., Okoh, R. N., Ike, P. C., Nnabuife, E. L. C., & Orji, E. C. (2010). *Integrated farming system and its effect on farm cash income in Awka south agricultural zone of Anambra State, Nigeria.* [http://www.idosi.org/aejaes8\(1\)/1.pdf](http://www.idosi.org/aejaes8(1)/1.pdf)

Walia, S. S., & Kaur, N. (2013). Integrated Farming System - An Ecofriendly Approach for Sustainable Agricultural Environment - A Review. *Greener Journal of Agronomy, Forestry and Horticulture*, 1(1), 001-011.
<https://doi.org/10.15580/gjafh.2013.1.071813740>