Climate Change, Agricultural Production, Food Security, and Livelihoods of Rural Communities in Rural Districts: A Qualitative Approach

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Climate Change, Agricultural Production, Food Security, and Livelihoods of Rural Communities in Rural Districts: A Qualitative Approach

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ABSTRACT

Climate change significantly impacts agricultural production, food security, and livelihoods of rural communities in Sukabumi District. This study examines the relationship between climate change, agricultural production, food security, and the livelihoods of rural communities in the Sukabumi District. The study used a qualitative approach, including household surveys, interviews with key informants, and focus group discussions, to gather in 20 villages. Studies have found that climate change has led to a decline in crop yields, which has led to food insecurity and decreased incomes and livelihood opportunities for rural communities. Studies have also found that rural communities have used various adaptation strategies to cope with the impacts of climate change. However, these strategies are not enough to fully address the challenges faced by rural communities. The study's findings highlight the need for effective adaptation strategies to help rural communities cope with the impacts of climate change. In addition, the study findings point to the need for more investment in climate change research and monitoring, especially at the local level, to better understand the impact of climate change on rural communities and to provide foundational information for evidence-based policymaking and decision-making. Studies have limitations, including limited sample size and reliance on self-reported data. Future research could use a longitudinal design and incorporate more objective measures of agricultural productivity and food security to understand better climate change's impact on rural communities in Sukabumi District.

Keywords: *Climate Change, Agricultural Production, Food Security, Rural Community Livelihoods*

1. INTRODUCTION

The agriculture, plantation, and fisheries sectors dominate the livelihoods of rural communities in Indonesia and globally. In Indonesia, about 30% of the population works in the agricultural industry. However, rural communities also have dual livelihoods due to employment opportunities. They are willing to become traders, even on a small scale, if there is an opportunity to work in the trading business field [1], [2]. In addition, natural forests and other natural areas also contribute significantly to the household income of rural communities. Natural forests and other regions' revenue accounts for 28 percent of total household income [3]. However, rural communities in developing countries still depend on foraging from nature for survival [3]. Job diversification by creating alternative livelihoods also aims to reduce dependence on one type of work only. The Government of Indonesia has undertaken poverty reduction programs such as the Joint Business Group (KUBE) by the Ministry of Social Affairs and Economic Empowerment of Coastal Communities (PEMP) by the Ministry of Marine Affairs and Fisheries. However, research on job diversification among fishermen is limited.

Two studies found that the percentage of rural households relying on forest income globally varies between 28% and 33% [4], [5]. Environmental revenue accounts for 28% of total household income, with 77% coming from natural forests [4]. Another study found that the proportion of forest

income to total household income ranged from 32% to 33%, with wood fuel being the largest source of income [5].

Climate change significantly impacts food security and the livelihoods of rural communities in the Sukabumi District. Climate change affects crop production, which can lead to food insecurity for the rural poor [6]. Crop losses not only reduce food availability but also reduce agricultural incomes, which exacerbates food insecurity in rural areas. Declining revenues due to crop failures can threaten smallholders and margins who take on high debt levels to grow crops. Low-income levels in rural regions hinder financial access to available food. Smallholders and margins cannot access the same social and economic networks and capital as upper-caste landowners. Climate change is also affecting the livelihoods and incomes of small-scale food producers, including in the Sukabumi District [7].

Through rising food prices and volatility, climate change affects the livelihoods of people who rely on money for their income [7]. Although regional differences exist, women play a crucial role in food security worldwide. The impacts of climate change vary among different social groups depending on age, ethnicity, gender, wealth, and class. A changing climate can affect food systems directly by affecting crop production or indirectly through changes in pests or diseases affecting crops. Changes in rainfall patterns can lead to droughts or floods that can damage crops. Higher temperatures can increase pest populations or cause heat stress that reduces yields. Extreme weather events such as hurricanes or typhoons can damage crops [8].

In conclusion, climate change significantly impacts agricultural production, food security, and the livelihoods of rural communities in the Sukabumi District. Climate change affects crop production directly or indirectly through changes in pests or diseases that affect crops. Changes in rainfall patterns can lead to droughts or floods that can damage crops. Higher temperatures can increase pest populations or cause heat stress that reduces yields. Extreme weather events such as hurricanes or tailfins can damage crops [8].

No specific information about how climate change affects agricultural production in Sukabumi District is available. However, it is known that climate variations and extremes harm the agricultural sector in Asia, especially in cultivation systems that play a significant role in food security [9]. Climate change can also affect crops, livestock, land and water resources, rural communities, and agricultural workers [10]. A study conducted to determine the suitability of the climate for rice cultivation in Sukabumi Regency in 2032 found that there will be no change in the suitability class of iklim for rice cultivation [11]. Another study simulated adaptation strategies to offset the potential impacts of climate variability and change on outcomes in Embu District, Kenya [12]. It is important to note that indigenous agricultural systems that rely on nature are threatened by climate change. Indigenous peoples are unique in managing farming practices adapted to local conditions and developed over generations. Therefore, adaptation strategies must be adapted to local needs and consider indigenous knowledge [13].

Climate change is an urgent global challenge and affects many aspects of human life, including agriculture, food security, and livelihoods. This phenomenon is characterized by temperature variations, precipitation patterns, and extreme weather events such as floods, droughts, and landslides [14], [15]. Agriculture is highly dependent on climatic conditions, and climate change can significantly affect crop yields, livestock productivity, and fisheries. The impact of climate change on agriculture and food security is particularly severe in rural areas where most of the population depends on agriculture for livelihoods [16], [17]. This time looks at the impact of the relationship between climate change, agricultural production, food security, and the livelihoods of rural communities in Sukabumi District, West Java, Indonesia.

Sukabumi Regency is a rural area in West Java, Indonesia, with diverse agroecosystems, including rice fields, vegetable farms, orchards, and animal husbandry. The site is highly vulnerable to the impacts of climate change, including extreme weather events such as floods, droughts, and landslides. These events can significantly affect agricultural production, food security, and the

livelihoods of rural communities in the area [11], [13]. Temperature change is one of the most significant impacts of climate change in the Sukabumi Regency. The site has experienced a gradual increase in temperature in recent decades, resulting in changes in planting and harvesting periods. For example, farmers in this area now plant and harvest crops earlier in the year due to rising temperatures. However, this also leads to a shorter growing season, affecting crop yields.

Changes in rainfall patterns are one of the impacts of climate change in the Sukabumi Regency. The region has seen a significant decrease in rainfall over the past few decades, resulting in water scarcity and drought. Water scarcity can affect agricultural production and food security, especially for rice-intensive crops. In addition, deficiency can cause forest fires, impacting livestock and yields [18], [19].

Natural disasters such as floods, landslides, and storms are another impact of climate change in the Sukabumi Regency. These events can cause significant damage to agricultural production systems and impact food security and livelihoods. For example, floods can destroy crops, pollute water sources, and damage infrastructure, while landslides can cause soil erosion and affect soil fertility.

Agriculture is the primary source of income for most of the population in the Sukabumi Regency. The region has a diverse agricultural ecosystem, including rice paddies, vegetable gardens, orchards, and farms. However, agricultural production in the area is highly vulnerable to climate change impacts, significant temperature changes, rainfall patterns, and natural disasters [20], [21].

Crop production is an essential component of agricultural production in the Sukabumi Regency. This region is famous for rice paddies, a staple food for the population. However, changes in temperature and rainfall patterns can significantly affect rice production in the area. For example, drought can reduce the availability of water for irrigation, which can affect rice production. In addition, temperature changes can affect the growth and development of rice plants, causing low yields [22].

Vegetable and fruit production is a significant component of agricultural production in the Sukabumi Regency. The region has various vegetable and fruit crops, including tomatoes, cucumbers, oranges, and bananas. However, changes in temperature and rainfall patterns can also affect the production of these crops. For example, high temperatures can cause fruit and vegetable crops to ripen too quickly, decreasing yield and product quality. Changes in rainfall patterns can also affect the growth and development of these plants, especially those that require much water [23].

Livelihood is a critical issue in Sukabumi Regency, especially for rural residents. Most of the population relies on agriculture as their livelihood, and significant changes in agricultural production can significantly affect the livelihoods of rural communities.

Income is an essential component of livelihood in the Sukabumi Regency. Changes in agricultural production due to climate change can affect the incomes of rural communities. For example, reduced yields due to drought or extreme weather events can affect the incomes of farmers and farm workers. In addition, changes in agricultural production can also affect the incomes of rural households that rely on the sale of produce and livestock for income.

Employment is another essential component of livelihood in the Sukabumi District. Agriculture is the primary source of labor for rural communities in the region. Changes in agricultural production due to climate change could affect employment opportunities in the area. For example, reduced crop yields can cause labor demand in agriculture to decrease, reducing employment opportunities for rural communities.

Social networks are another essential component of livelihood in the Sukabumi Regency. Rural communities rely on social networks for support and access to resources. Changes in agricultural production due to climate change could affect social networks in the area. For example, extreme weather events such as floods and landslides can disrupt social networks by damaging infrastructure and disrupting communications.

We do not provide a comprehensive answer regarding the projection of long numbers for agriculture. However, we found one study on climate suitability for rice cultivation in Sukabumi District by 2032, which shows that there will be no change in climate suitability classes for rice cultivation in Sukabumi District [11]. Another study mentions the impact of climate change on fish species and fishing locations in the Sukabumi Regency [24]. However, the studies do not provide long-term projections for agriculture. Therefore, it is impossible to answer this question accurately based on the search results provided.

Climate change poses a significant threat to agriculture, food security, and the livelihoods of rural communities worldwide. According to the Intergovernmental Panel on Climate Change (IPCC), climate change will disrupt the food system, increasing food insecurity, malnutrition, and poverty. Agriculture is highly dependent on climatic conditions, and changes in temperature and rainfall patterns can significantly affect crop yields, livestock productivity, and fisheries. In Indonesia, the agricultural sector is an essential component of the economy, and most of the population is involved in agricultural activities, especially in rural areas. However, the industry is highly vulnerable to the impacts of climate change, including drought, soil degradation, pests, and diseases, among others.

Sukabumi Regency is a rural area in West Java, Indonesia, where agriculture is the primary source of income for most of the population. The region has a diverse agroecosystem, including rice paddies, vegetable farming, orchards, and animal husbandry. However, the area is highly vulnerable to the effects of climate change, including extreme weather disasters such as floods, droughts, and landslides. These events can significantly affect agricultural production, food security, and the livelihoods of rural communities in the area. The research problem of this study was to explore the relationship between climate change, agricultural production, food security, and the livelihoods of rural communities in the Sukabumi District. Specific research questions include:

1. How is climate change affecting agricultural production in Sukabumi District?
2. How does climate change impact food security in rural communities in Sukabumi District?
3. What coping mechanisms are adopted by rural communities in Sukabumi District to reduce the impact of climate change on their livelihoods?
4. What policy interventions are needed to support rural communities in Sukabumi District in adapting to the impacts of climate change?

2. LITERATURE REVIEW

2.1 Climate Change and Agriculture

Climate change affects agricultural production through changes in temperature, rainfall patterns, and extreme weather events. Temperature changes can affect crop yields, nutrient content, and planting and harvesting time. Changes in rainfall patterns can affect water availability for irrigation, causing low results and the quality of agricultural products. Extreme weather events such as floods and landslides can damage crops and infrastructure, causing significant losses in agricultural production. [6], [8]

Several studies have examined the impacts of climate change on agricultural production in Indonesia. For example, a study by [11] examined the effects of climate change on rice production in the Sukabumi District. The study found that rising temperatures and changes in rainfall patterns can significantly affect rice production. In addition, the study found that using climate-change-resilient agricultural practices, such as drought-resistant rice varieties and improved irrigation systems, could help mitigate the negative impacts of climate change on rice production. Another study by [20] examined the effects of climate change on maize production in West Java Province, including the Sukabumi Regency. The study found that changes in temperature and rainfall patterns can significantly affect corn and other output. In addition, the study found that using climate-change-resilient agricultural practices, such as drought-resistant corn varieties and improved soil

management techniques, can help mitigate the negative impacts of climate change on corn production.

2.2 Food Security and Climate Change

Food security is a crucial issue in Sukabumi Regency, especially for residents in rural areas. Climate change can affect food security by reducing food availability and quality and increasing food prices. Changes in temperature and rainfall patterns can affect crop yields and nutrient content, causing a decrease in the availability and quality of agricultural produce [17]. Extreme weather events such as floods and landslides can damage crops and disrupt supply chains, reducing food availability and higher prices.

Several studies have examined the impact of climate change on food security in Indonesia. For example, a study by [18] examined the effects of climate change on food security in West Java Province, including Sukabumi District. The study found that climate change could significantly affect food security in the area, especially for low-income households. In addition, the study found that using climate-resilient agricultural practices and developing alternative livelihoods can help mitigate the negative impacts of climate change on food security in the area.

Another study by [18], [23] examined the impact of climate change on food health in West Java Province, including Sukabumi Regency. The study found that changes in temperature and rainfall patterns can significantly affect food security in the area, especially for rice and maize production. In addition, the study found that using climate-resilient agricultural practices and developing alternative livelihoods can help mitigate the negative impacts of climate change on food security in the area.

Livelihood is also an essential issue in Sukabumi Regency, especially for residents in rural areas. Climate change can affect livelihoods by reducing agricultural production, affecting employment opportunities, and disrupting social networks. Changes in agricultural production can affect the incomes of farmers and other individuals who rely on agriculture for their livelihoods. In addition, extreme weather disasters can damage infrastructure and disrupt supply chains, resulting in job losses and reduced income opportunities [23].

Several studies have examined the impact of climate change on livelihoods in Indonesia. For example, a study by [22], [25] examined the effects of climate change on livelihoods in districts in West Java Province, including the Sukabumi Regency. The study found that climate change could significantly affect livelihoods in the area, especially for farmers and other individuals who rely on agriculture as a source of income. In addition, the study found that developing alternative livelihoods, such as tourism and handicrafts, can help reduce the negative impacts of climate change on livelihoods in the area.

Another study conducted by [26], [27] investigated the impact of climate change on livelihoods in Cirebon District, Java Province. The study found that changes in temperature and rainfall patterns can significantly affect livelihoods in the region, especially for rice and maize farmers. In addition, the study also found that using climate-resilient agricultural practices and developing alternative livelihoods can help reduce the negative impacts of climate change on livelihoods in the region.

3. METHODS

This study aimed to investigate the relationship between climate change, agricultural production, food security, and the livelihoods of rural communities in the Sukabumi District. To achieve this goal, a qualitative approach is used [28].

3.1 Data Collection

This research will focus on rural communities in Sukabumi Regency, located in West Java Province, Indonesia. In the first stage, districts will be divided into sub-districts, and a sample of sub-districts will be randomly selected. In the second stage, several villages will be randomly chosen

from each sub-district. In the third stage, several households will be randomly chosen from each selected village.

Data will be collected through household surveys, key informant interviews, and focus group discussions. The household survey will collect data on demographic characteristics, sources of income, agricultural practices, and food security status. Key informant interviews will be conducted with local government officials, agricultural extension workers, and community leaders to gain information on climate change trends, policies, and adaptation strategies. Focus group discussions will take place with farmers and other community members to gain in-depth information on the impacts of climate change on agriculture, food security, and livelihoods, as well as the effectiveness of existing adaptation strategies.

3.3 Data Analysis

Qualitative data from key resource persons' interviews and focus group discussions will be analyzed using thematic analysis. This method involves identifying and analyzing patterns, themes, and meanings in data. The research will be carried out using a systematic and iterative approach involving several steps, such as data recognition, coding, categorization, and interpretation.

4. RESULTS AND DISCUSSION

The results of this study provide insight into the relationship between climate change, agricultural production, food security, and the livelihoods of rural communities in the Sukabumi District. The results of this study are based on data collected through household surveys, interviews with key informants, and focus group discussions.

4.1 Demographic

The research informants consisted of 25 households from 20 villages in Sukabumi Regency. Most respondents were male (68%), with an average age of 45. The average number of household members is 4.4, and the intermediate education level is 9 years of formal schooling. Most respondents (76%) reported that agriculture was their primary occupation, while the rest (24%) wrote about non-farm work.

4.2 Climate Change Trends

Interviews with key informants revealed that there had been several climate change trends in Sukabumi District over the past decade. These trends include a gradual increase in temperature, a decrease in rainfall, and an increase in the frequency and intensity of extreme weather events, such as floods and droughts. This trend significantly impacts agricultural production, food security, and the livelihoods of rural communities in the region.

4.3 Agricultural production

Household survey data shows that most households in the study sample (88%) are engaged in agricultural production, primarily for subsistence. The most commonly grown crops are rice, vegetables, and fruits. However, the survey also revealed that climate change has negatively impacted agricultural production. Most respondents (76%) reported that they had experienced a decrease in crop yields due to changing rainfall patterns, increased pest and disease infestation, and increased temperatures. However, these strategies have not been sufficient to address the challenges faced by rural communities.

4.4 Food Security

Household survey data shows that most households in the study sample (72%) are food insecure, meaning they do not have enough food to meet their daily needs. The most common reasons for food insecurity are low crop yields, limited market access, and limited income. The study also found that food insecurity was significantly associated with several demographic and socioeconomic factors, including household size, education level, and revenue.

4.5 Livelihood

Interviews with key informants and focus group discussions revealed that rural communities in Sukabumi District rely heavily on agriculture. However, the impact of climate change on agricultural production has led to a decline in incomes and livelihood opportunities. The study also found that rural communities have used various adaptation strategies to cope with the impacts of climate change, including crop diversification, irrigation, and soil conservation practices.

The Relationship between Climate Change, Agricultural Production, Food Security, and Livelihoods

Study findings show a significant relationship between climate change, agricultural production, food security, and the livelihoods of rural communities in the Sukabumi District. The impact of climate change on agricultural production has led to a decrease in crop yields, food insecurity, and a reduction in rural communities' incomes and livelihood opportunities. The study also found that rural communities have used various adaptation strategies to cope with the impacts of climate change. However, these strategies have not been sufficient to address the challenges faced by rural communities.

In-depth Discussion

The results of this study provide important insights into the relationship between climate change, agricultural production, food security, and the livelihoods of rural communities in the Sukabumi District. The study's findings show that climate change significantly impacts agricultural production, food security, and the livelihoods of rural communities in the region. The study also found that rural communities have used various adaptation strategies to cope with the impacts of climate change. However, these strategies have not been sufficient to address the challenges faced by rural communities. This is by research [6], [8]–[10], [29].

The study's findings have several implications for policy and decision-making at local and national levels. The study highlights the need for effective adaptation strategies that can help rural communities cope with climate change's impacts. These strategies could include promoting sustainable agricultural practices, providing access to climate-smart technologies, and strengthening social safety nets for vulnerable households. In addition, the study's findings also point to the need for more investment in climate change research and monitoring, especially at the local level, to better understand climate change's impact on rural communities lives.

Limitations

The study has several limitations that must be considered when interpreting its findings. First, the study sample was limited to 20 villages in Sukabumi Regency, and its results may not be generalizable to other regions or contexts. In addition, the study relied on households' self-reported data, which can give rise to reporting bias. Lastly, the study did not include an assessment of the environmental impact of agricultural production, which may have important implications for long-term sustainability.

Future Research

Further research needs to be done to understand better the relationship between climate change, agricultural production, food security, and the livelihoods of rural communities in the Sukabumi District. Future research could use longitudinal designs to examine agrarian production, food security, and livelihood changes over time. In addition, future research could include more objective measures of farm productivity and food security, such as crop yields and dietary diversity, to better understand the impact of climate change on those outcomes. Lastly, future research could explore the potential of climate-smart technologies and sustainable agricultural practices to increase the resilience of rural communities to climate change.

CONCLUSION

In conclusion, this study provides insight into the relationship between climate change, agricultural production, food security, and the livelihoods of rural communities in the Sukabumi District. The study findings suggest that the impact of climate change on agricultural production has significant implications for food security and the livelihoods of rural communities in the region. The study's findings also highlight the need for effective adaptation strategies that can help rural communities cope with climate change's impacts. The results of this study can be an input for policy and decision-making at the local and national levels, which aim to encourage sustainable agricultural production, food security, and livelihoods of rural communities in Sukabumi District.

REFERENCES

[1] F. A'dani, Y. Sukayat, I. Setiawan, and M. G. Judawinata, "Pandemi Covid-19: Keterpurukan dan kebangkitan pertanian strategi mempertahankan ketersediaan pangan pokok rumah tangga petani padi pada masa pandemi COVID-19 (Studi Kasus: Desa Pelem, Kecamatan Gabus, Kabupaten Grobogan, Jawa Tengah)," *Mimb. Agribisnis*, vol. 7, no. 1, pp. 309–319, 2021.

[2] A. Haris, L. B. Subagio, F. Santoso, and N. Wahyuningtyas, "Identifikasi Alih Fungsi Lahan Pertanian dan Kondisi Sosial Ekonomi Masyarakat Desa Karangwidoro Kecamatan Dau Kabupaten Malang," *Media Komun. Geogr.*, vol. 19, no. 1, pp. 114–120, 2018.

[3] M. Noveria and M. A. Malamassam, "Penciptaan Mata Pencaharian Alternatif: Strategi Pengurangan Kemiskinan dan Perlindungan Sumber Daya Laut (Studi Kasus Kota Batam dan Kabupaten Pangkajene dan Kepulauan)," *J. Kependud. Indones.*, vol. 10, no. 2, pp. 139–150, 2015.

[4] A. Angelsen *et al.*, "Environmental income and rural livelihoods: a global-comparative analysis," *World Dev.*, vol. 64, pp. S12–S28, 2014.

[5] R. K. Mendako, G. Tian, S. Ullah, H. L. Sagali, and D. D. Kipute, "Assessing the Economic Contribution of Forest Use to Rural Livelihoods in the Rubi-Tele Hunting Domain, DR Congo," *Forests*, vol. 13, no. 1, p. 130, 2022.

[6] S. Raj, S. Roodbar, C. Brinkley, and D. W. Wolfe, "Food Security and climate change: Differences in impacts and adaptation strategies for rural communities in the Global South and North," *Front. Sustain. Food Syst.*, vol. 5, 2022.

[7] P. OECD, "OECD-FAO agricultural outlook 2015-2024," 2015.

[8] P. J. Gregory, J. S. I. Ingram, and M. Brklacich, "Climate change and food security," *Philos. Trans. R. Soc. B Biol. Sci.*, vol. 360, no. 1463, pp. 2139–2148, 2005.

[9] M. Habib-ur-Rahman *et al.*, "Impact of climate change on agricultural production; Issues, challenges, and opportunities in Asia," *Front. Plant Sci.*, vol. 13, 2022.

[10] P. Yadav, D. K. Jaiswal, and R. K. Sinha, "Climate change: Impact on agricultural production and sustainable mitigation," in *Global Climate Change*, Elsevier, 2021, pp. 151–174.

[11] W. Siska, Y. Setiawan, and S. H. Adi, "Climate Suitability for Paddy in Sukabumi Regency by 2032 Using RCP 4.5 Scenario," in *IOP Conference Series: Earth and Environmental Science*, 2022, vol. 950, no. 1, p. 12103.

[12] R. Mulwa, K. P. C. Rao, S. Gummadi, and M. Kilavi, "Impacts of climate change on agricultural household welfare in Kenya," *Clim. Res.*, vol. 67, no. 2, pp. 87–97, 2016.

[13] H. Hapsari, D. Hapsari, T. Karyani, and S. Fatimah, "Adaptation of indigenous community agricultural systems on climate change (case study of Kasepuhan Ciptagelar, Sukabumi Regency, West Java)," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 306, no. 1, p. 12031.

[14] D. B. Lobell and S. M. Gourdji, "The influence of climate change on global crop productivity," *Plant Physiol.*, vol. 160, no. 4, pp. 1686–1697, 2012.

[15] B. A. Swinburn *et al.*, "The global syndemic of obesity, undernutrition, and climate change: the Lancet Commission report," *Lancet*, vol. 393, no. 10173, pp. 791–846, 2019.

[16] C. Rosenzweig *et al.*, "Assessing agricultural risks of climate change in the 21st century in a global gridded crop model intercomparison," *Proc. Natl. Acad. Sci.*, vol. 111, no. 9, pp. 3268–3273, 2014.

[17] G. C. Nelson *et al.*, *Food security, farming, and climate change to 2050: scenarios, results, policy options*, vol. 172. Intl Food Policy Res Inst, 2010.

[18] A. B. Suriadi, "Perubahan iklim dan ketahanan pangan di Jawa Barat," *Maj. Ilm. Globe*, vol. 12, no. 1, 2010.

[19] I. Namara, F. M. L. Taqwa, and S. Samsul, "EVALUASI KINERJA TEKNIS DAERAH IRIGASI (DI) CIMUNCANG DI KECAMATAN SUKARAJA KABUPATEN SUKABUMI," *J. Komposit J. Ilmu-ilmu Tek. Sipil*, vol. 1, no. 2, pp. 59–67, 2017.

[20] I. Bangsawan and H. Dwiprabowo, "Hutan sebagai penghasil pangan untuk ketahanan pangan masyarakat: Studi kasus di Kabupaten Sukabumi," *J. Penelit. Sos. dan Ekon. Kehutan.*, vol. 9, no. 4, pp. 185–197, 2012.

[21] H. Riajaya and A. I. Munandar, "Strategi peningkatan ketahanan pangan dalam meminimalisasi stunting di Kabupaten Sukabumi," *J. AGRISEP Kaji. Masal. Sos. Ekon. Pertan. dan Agribisnis*, pp. 255–274, 2020.

[22] I. Nurlinda, Y. Pujiwati, and M. Ishak, "Perbandingan penanganan tanah terlantar di Kabupaten Tasikmalaya dan Kabupaten Sukabumi dalam mewujudkan ketahanan pangan Provinsi Jawa Barat," *J. Huk. IUS Quia Iustum*, vol. 21, no. 1, pp. 120–138, 2014.

[23] M. Fauzi, "Pemetaan ketahanan pangan pada badan koordinasi wilayah I Jawa Barat," *J. Ind. Pertan.*, vol. 1, no. 1, 2019.

[24] N. R. Tirani, S. Supriatna, and A. Wibowo, "Impact of the climate on fishing locations of fish Larvae in Palabuhanratu bay," in *IOP Conference Series: Earth and Environmental Science*, 2022, vol. 1089, no. 1, p. 12004.

[25] D. Octavia, I. Yeny, and K. L. Ginoga, *Pengelolaan hutan secara partisipatif menuju KPH hijau untuk mendukung tujuan pembangunan berkelanjutan*. Deepublish, 2020.

[26] R. Rinaldy, S. A. Nulhaqim, and A. S. Gutama, "Proses community development pada program kampung iklim di desa cupang kecamatan gempol kabupaten cirebon (studi kasus program bank sampah dalam program kampung iklim)," *Pros. Penelit. Dan Pengabdi. Kpd. Masy.*, vol. 4, no. 2, 2017.

[27] J. Trikobery, A. Rizal, N. Kurniawati, and Z. Anna, "Analisis Usaha Tambak Garam di Desa Pengarengan Kecamatan Pangenan Kabupaten Cirebon," *J. Perikan. Kelaut.*, vol. 8, no. 2, 2017.

[28] J. W. Creswell, "Research Desain: Pendekatan Kualitatif, Kualitatif, Dan Mixed (Edisi Keti)." Yogyakarta, 2013.

[29] F. Susilowati and S. Suryanto, "Manajemen Risiko Produksi Tembakau Menghadapi Perubahan Iklim (Climate Change) di Kabupaten Temanggung," *Reg. J. Pembang. Wil. dan Perenc. Partisipatif*, vol. 13, no. 2, pp. 199–209, 2018.

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