Assessing Climate-Smart Agriculture Adoption: Enhancing Rice Production Resilience in South Sumatra, Indonesia

by Yakup Yakup

Submission date: 15-Jul-2025 06:15PM (UTC+0700)
Submission ID: 2715337303
File name: e_Adoption_-_Enhancing_Rice_Production,_Journal_of_SAET_2024.pdf (1.78M)
Word count: 4478
Character count: 26551

Journal of Smart Agriculture and Environmental Technology
e-ISSN:3021-8802
Vol. 2, No. 3, December 2024
https://josaet.com | https://doi.org/10.60105/josaet.2024.2.3.93-99

Research Paper

Assessing Climate-Smart Agriculture Adoption: Enhancing Rice Production Resilience in South Sumatra, Indonesia

Wandayantolis[1], Dedik Budianta[2]*, Yakup[3], Dodo Gunawan[4]

[1] *Doctoral Programme in Agricultural Sciences, Faculty of Agriculture, Sriwijaya University, Palembang 30139, Indonesia*
[2] *Department of Soil Science, Faculty of Agriculture, Sriwijaya University. Jl. Raya Palembang-Prabumulih Km 32, Indralaya 30662, Ogan Ilir,South Sumatra, Indonesia*
[3] *Department of Agronomy, Faculty of Agriculture, Sriwijaya University. Jl. Raya Palembang-Prabumulih Km 32, Indralaya 30662, Ogan Ilir,South Sumatra, Indonesia*
[4] *State College of Meteorology, Climatology and Geophysics, Pondok Betung, South Tangerang 15521, Indonesia*
***Corresponding author**: dedik.budianta@unsri.ac.id

Article History: Received: June 12, 2024, Accepted: July 15, 2024

Abstract
This study investigates the adoption of Climate-Smart Agriculture (CSA) practices among predominantly traditional rice farmers in South Sumatra, Indonesia, and proposes strategies for enhancing resilience to climate variability. A total of 98 farmers across nine districts participated in structured surveys and in-depth interviews. The results showed a reliance on modern machinery for land preparation (62.8%) alongside a considerable use of traditional tools (26.5%). High awareness of climate change (87.9%) and its impacts, along with a substantial understanding of the negative effects of chemical fertilizers (67.7%), were observed. The use of weather forecasts by 34.7% of respondents highlighted the importance of reliable climate information in agricultural decision-making. Adaptive practices for drier conditions include water management (40%) and crop management methods (25%), while improved drainage (40%) and other flood prevention measures (35%) were commonly adopted for wetter conditions. Despite these efforts, 50% of farmers reported decreased productivity during dry seasons due to the significant impact of irregular rainfall, while approximately 42% managed to increase productivity during wetter conditions through adaptive practices. To enhance CSA adoption, continuous education and awareness programs, promoting energy-efficient machinery and organic farming methods, and improving access to accurate weather forecasts are recommended. The development of resilient crop varieties and the provision of financial and technical support are also essential. Implementing these strategies can facilitate the integration of CSA into the farming system, ensuring a resilient and sustainable agricultural sector in South Sumatra that supports both productivity and environmental preservation, contributing to long-term food security and sustainable development in the region.

Keywords
Climate-Smart Agriculture, Climate Variability, Rice Production, Sustainable Farming Practices.

1. INTRODUCTION

Food security is the availability and access to sufficient, safe, as well as nutritious food that meets dietary needs and preferences for an active and healthy life. According to the definition by the World Food Summit in 1996, it comprises the availability, access, utilization, and stability of food resources (Ingram, 2011; Shaw, 2007). In South Sumatra, Indonesia, food security is particularly challenged by climate variability, which influences both the availability and stability through phenomena such as El Niño and La Niña. As a result, crop yields and agricultural activities are severely threatened and disrupted, respectively (Wandayantolis et al., 2023, 2024).

Despite the challenges, Climate-Smart Agriculture (CSA) is a sustainable solution aimed at enhancing food security by mitigating the impacts of climate change and increasing agricultural resilience (Ghosh, 2019; Williams et al., 2015; Zougmoré et al., 2015). Lipper et al. (2014) stated that CSA requires coordinated efforts among farmers and policymakers to effectively build resilience through evidence-based methods, enhance local institutional capacities, promote policy coherence, and integrate climate financing with agricultural development. This integrated method ensures solutions are both context-specific and supported by innovative policies, adaptable to the dynamic climate landscape (Ngoma et al., 2018; Scherr et al., 2012; Taylor, 2018).

Studies from various global contexts supported the implementation of CSA. For instance, Kurgat et al. (2020) explored CSA technologies in Tanzania, outlining the role of household resource management in enhancing technology adoption, particularly under female control. This suggested significant potential for synergy and technology transfer within communities. Additionally, Djufry et al. (2022) identified key practices among coffee smallholders in Indonesia, including crop diversification and water management. This facilitated the mitigation of adverse effects of climate on crop production and quality. The practices are essential for reducing the impact of agricultural activities on greenhouse gas emissions and adapting to climate change (Altieri and Nicholls., 2017; Iglesias and Garrote., 2006; Zougmoré et al., 2016).

This study aims to investigate the current state of CSA practices among rice farmers in South Sumatra, Indonesia, and propose strategies for enhancing rice production resilience to climate variability. By focusing on demographic characteristics, farming practices, and the adoption of CSA technologies, a context-specific framework for implementation was developed. This framework prioritizes strategies such as the integration of improved crop varieties, water-efficient practices, and sustainable soil management methods. The novelty of this study lies in its comprehensive assessment of the current CSA practices and the identification of barriers and opportunities specific to South Sumatra. By tailoring global CSA strategies to the local context, this study provides innovative, context-specific solutions that address both traditional and modern farming practices. This framework supports the long-term sustainability and resilience of rice production in South Sumatra and contributes to the broader goals of food security and agricultural development in the region.

2. EXPERIMENTAL SECTION

2.1 Study Location

This study was conducted in South Sumatra, Indonesia, a region characterized by significant agricultural activity and diverse climatic impacts that crucially influence food security and agricultural productivity. The region, located between approximately 1° to 4° S and 102° to 106° E, is significantly affected by both seasonal variations and extreme weather events such as El Niño and La Niña, leading to substantial alterations in crop production cycles and yields. This variability presented a critical area for implementing CSA practices, with the aim of enhancing resilience and stability in food production (Belay et al., 2023; Dejene et al., 2022). The landscape of the province was predominantly composed of rice fields, palm oil plantations, and rubber plantations. It is important to acknowledge that rice is a staple food and a major economic contributor (Adam et al., 2017; Syuhada et al., 2020; Wildayana, 2015). The research area is also displayed in Fig. 1, providing a visual representation of the geographical scope of the study.

2.2 Data Collection

Data was collected through structured surveys and direct interviews with farmers across South Sumatra to ensure comprehensive CSA adoption. In 2023, surveys were conducted with 98 farmers across 9 districts/municipalities. These included both closed-ended questions for quantitative analysis and open-ended questions for qualitative insights into CSA practices. The variables observed in this research included demographic characteristics (age, education level, farming experience), types of farming practices (modern vs. traditional tools), awareness and perception of climate change, usage of weather forecasts, and adaptive practices for different climatic conditions. Fig. 1 shows the distribution of respondents across the 9 districts/municipalities in South Sumatra, providing a visual representation of the geographical scope of the study.

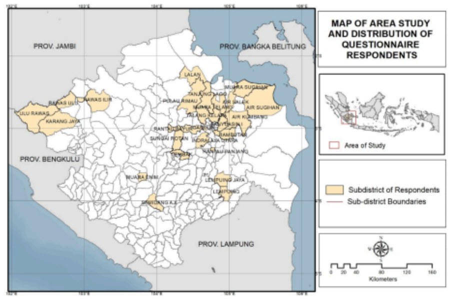

Figure 1. Map of South Sumatra showing the distribution of survey respondents across the 9 districts/municipalities

In-depth interviews were conducted with a subset of farmers to collect detailed qualitative data on experiences with CSA. These interviews aimed to explore the benefits and challenges faced. It was important to acknowledge that respondents were purposively selected to capture a broad spectrum of experiences (Guest et al., 2006). Local agricultural extension officers assisted in distributing the surveys and conducting the interviews, ensuring effective engagement from respondents. Ethical considerations, including informed consent and confidentiality, were rigorously upheld in the data collection process (Orb et al., 2001).

2.3 Data Analysis

Survey data were analyzed using statistical software to perform descriptive statistics and explore correlations between variables related to CSA adoption. This analysis identified key patterns and trends across the surveyed population. Interviews were transcribed and subjected to thematic analysis to extract as well as interpret significant themes. This method comprised a detailed coding process to distill insights about the motivations for and barriers to CSA implementation. Integrating quantitative and qualitative data provided a comprehensive understanding of the practices in South Sumatra, enhancing the validity and reliability of the study. This mixed method offered valuable insights into the practical implementation of CSA and informed policy and practice (Creswell and Creswell., 2017).

3. RESULTS AND DISCUSSION

3.1 Overview of Respondent Demographics and Farming Practices

This study surveyed a total of 98 farmers from 9 districts across South Sumatra, capturing a broad spectrum of agricultural environments in the region. The demographic breakdown of respondents showed a diverse group predominantly engaged in staple crops such as rice, alongside other significant crops namely palm oil and rubber. The age distribution of respondents (Fig. 2) signified a significant representation of middle-aged farmers, with 48% being over 40 years old. This represented a seasoned group with considerable experience in farming practices. Approximately 60% of respondents had more than 10 years of farming experience, providing a depth of knowledge and practical insights into traditional and modern agricultural practices. According to the survey, the average monthly income per household was around 3 million IDR (approximately 200 USD), reflecting the economic context within which these farmers operate.

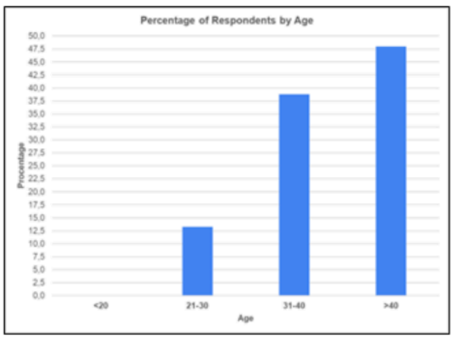

Figure 2. Age Distribution of Respondents

Education levels (Fig. 3) among farmers vary, with about 70% have completed at least secondary education. This facilitated a better understanding and adoption of new agricultural technologies and practices, including CSA methodologies. In terms of farming practices, the data shows a mix of traditional and modern methods.

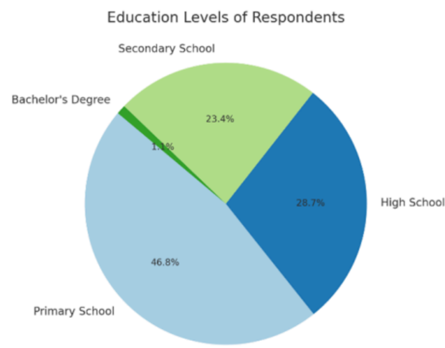

Figure 3. Education Levels of Respondents

The majority of farmers in South Sumatra relied heavily on machinery for land preparation and soil treatment, as detailed in Fig. 4. Approximately 62.8% utilized this method, while 26.5% adopted simpler, traditional tools. This significant reliance on heavy machinery presents a trend toward modernization in agricultural practices in the region. However, the use of such machinery, predominantly fueled by non-renewable energy sources, raises concerns about greenhouse gas emissions and the broader environmental impact (Smith et al., 2014). The heavy machinery used in land preparation currently results in higher CO2 emissions compared to traditional methods. This reliance on mechanization poses a challenge for CSA practices due to the greenhouse gas emissions generated. In contrast, the use of traditional tools, preferred by over a quarter of respondents, aligns with more sustainable practices, offering lower greenhouse gas emissions due to minimal energy requirements (Poeplau and Don., 2015).

The integration of traditional and modern practices presents a unique opportunity for policymakers to guide the agricultural sector toward a more sustainable trajectory. Promoting the use of energy-efficient or renewable energy-powered machinery could help reduce the carbon footprint associated with heavy devices (Odegard and Voet., 2014). Furthermore, promoting organic farming methods, as used by a small fraction (1.5%) of the survey respondents, could enhance soil health and carbon sequestration, contributing to the mitigation of climate change impacts (Gattinger et al., 2012). It was important to acknowledge that policies aimed at integrating modern agricultural technologies with traditional methods could foster an adaptive, environmentally sustainable agricultural framework, supporting both productivity and environmental preservation.

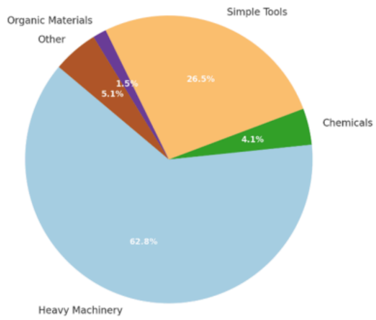

Figure 4. Methods of Land Preparation and Soil Treatment

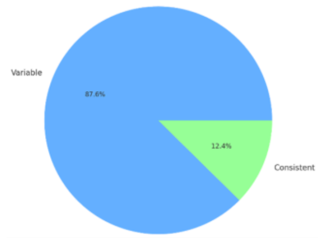

Figure 6. Perception of Rainfall Variability, Showing The Proportion of Respondents who Perceive The Yearly Rainfall Patterns As Consistent and Variable

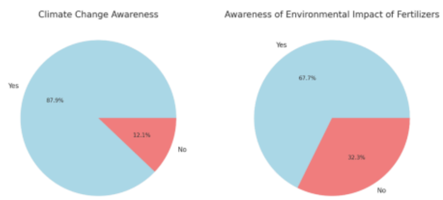

Figure 7. Awareness of Climate Change and Environmental Impact, showing the percentage of awareness of climate change and agricultural impacts, as well as information regarding the environmental effects of chemical fertilizers.

3.2 Adoption of CSA Practices

The use of weather forecasts from BMKG (Meteorological, Climatological, and Geophysical Agency) played a significant role in the farming decisions of many respondents. The survey data signified that 34.7% of respondents utilized theweather forecasts to determine the optimal time for planting, as detailed in Fig. 5. This incorporation of climate information is critical in adapting to the variability and unpredictability of weather patterns, allowing farmers to make informed decisions that can enhance crop yields.

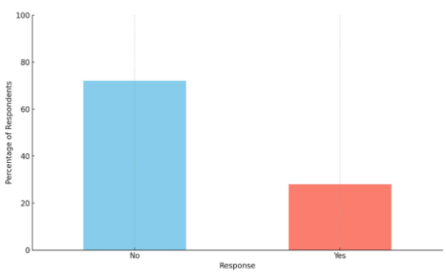

Figure 5. Percentage of Respondents Who Use BMKG Weather Forecasts to Determine Planting Times

The perceptions of farmers concerning climate variability are essential in understanding adaptation strategies and resilience. According to the survey, 87.6% of respondents believe that the yearly rainfall patterns in the region vary significantly, as detailed in Fig. 6. This perception presented the challenges farmers face in predicting weather conditions and outlined the importance of reliable forecasts and climate information. Approximately 87.9%of respondents were aware of the concept of climate change and the potential impact on agriculture, while 67.7% were informed about the negative effects of chemical fertilizers on the environment, as shown in Figure 7. This information reflects a growing awareness among farmers about the broader environmental impacts of the practices and the need for sustainable agricultural methods.

Farmers applied various strategies to adapt to changing climatic conditions. The adaptive practices for drier conditions include Water Management (40.0%), Crop Management (25.0%), Do Nothing (15.0%), Others (10.0%), Soil Management (5.0%), and Alternative Practices (5.0%). Water management practices include using irrigation systems, pumping water from rivers, and building reservoirs. Practical exercises conducted by farmers under Crop Management involve changing planting schedules to avoid peak drought periods and using drought-resistant crop varieties. In the case of Do Nothing (15.0%), some farmers choose not to take any specific actions. Other practices include various adaptive measures not falling into the mentioned categories. Soil Management consists of methods such as mulching to retain soil moisture. Alternative Practices (5.0%) comprise diversification into non-agricultural activities, such as engaging in local businesses or other forms of income generation to reduce dependency on farming during extreme weather conditions.

During wetter conditions, measures such as improving drainage and postponing planting were commonly adopted, as detailed in Fig. 8. The adaptive practices for the conditions include Water Management (40.0%), Others (35.0%), Soil Management (10.0%), Crop Management (10.0%), and Do Nothing (5.0%). Water management comprises practices such as enhancing drainage systems and pumping excess water out of fields. Meanwhile, other practices include constructing barriers to prevent flooding. Soil Management consists of methods to improve soil structure and prevent waterlogging. Furthermore, Crop Management includes adjusting planting schedules or switching to flood-tolerant crops. In the case of Do Nothing (5.0%), some portion of farmers do not perform any specific actions.

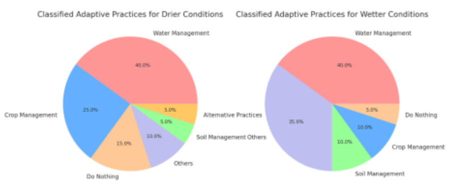

Figure 8. Adaptive Practices for Drier Conditions and Wetter Conditions, showing the various adaptive practices applied by respondents.

The adaptive practices showed the resilience and flexibility of farmers in the face of climatic challenges. Due to irregular rainfall, approximately 50% of farmers reported a decrease in productivity during unusually dry seasons, while 20.5% experienced an increase, 15.9% were uncertain, and 13.6% observed no change. In wetter conditions, 42.0% managed to increase productivity through adaptive practices. Approximately 21.6% experienced a decrease due to challenges such as flooding and waterlogging. Additionally, 22.7% are uncertain about the impact, and 13.6% reported no change in productivity under these conditions, as detailed in Fig. 9.

Results outlined the critical role of reliable weather forecasts in agricultural decision-making. The incorporation of BMKG weather forecasts into farming practices significantly improved yield stability and reduced risks associated with climate variability (Martinez-Feria and Basso., 2020; Mathieu and Aires., 2018). Furthermore, the high awareness of climate change and its impacts among farmers suggested a readiness to adopt more sustainable practices, which is essential for the successful implementation of CSA strategies (Crentsil and Karbo., 2021; Sardar et al., 2019).

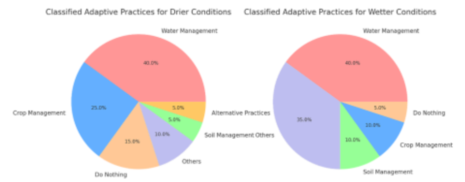

Figure 9. Impact of Rainfall Variability on Crop Yields, showing respondents' perceptions of changes in crop yields under drier and wetter conditions.

The adoption of water management methods was crucial for maintaining productivity under varying climatic conditions. For instance, improved irrigation systems enhanced water use efficiency and contributed to resilience against drought as well as flooding (Cornelis et al., 2019). Crop management strategies, such as planting drought-resistant varieties, were also crucial for adapting to climate stress and ensuring food security (Raza et al., 2019).

The survey presents the importance of education and awareness in promoting sustainable agricultural practices. Farmers who were more informed about the environmental impacts of chemical fertilizers and the benefits of sustainable practices were better equipped to make decisions in line with CSA goals. This was supported by recent studies explaining the need for continuous education and the integration of modern tools to enhance the adoption of CSA technologies (Sardar et al., 2019; Zakari et al., 2019).

4. CONCLUSION

In conclusion, this study investigated the adoption of Climate-Smart Agriculture (CSA) practices among rice farmers in South Sumatra, Indonesia. The findings revealed a significant reliance on modern machinery (62.8%) for land preparation, contrasting with 26.5% who used traditional tools, highlighting the challenge of greenhouse gas emissions. Integrating sustainable practices, such as energy-efficient or renewable energy-powered machinery, can balance productivity with environmental impact. High awareness of climate change (87.9%) and knowledge about the negative effects of chemical fertilizers (67.7%) indicate a readiness among farmers to adopt sustainable methods. The use of BMKG weather forecasts by 34.7% of respondents underscores the critical role of reliable climate information in decision-making. Adaptive strategies included water management (40%) for drier conditions and enhanced drainage systems (40%) for wetter conditions. Despite these efforts, 50% of farmers reported decreased productivity during dry seasons, while 42% increased productivity during wetter conditions through adaptive practices, highlighting the significant impact of irregular rainfall. To enhance CSA adoption, continuous education and awareness programs are essential. Promoting energy-efficient machinery and organic farming methods can reduce environmental impacts. Practical works conducted by farmers include using irrigation systems, changing planting schedules, and using drought-resistant crops. Improving access to accurate weather forecasts and developing resilient crop varieties are necessary steps. Financial and technical support will facilitate CSA adoption, helping South Sumatra develop a resilient, sustainable agricultural sector that supports both productivity and environmental preservation. This framework aligns with local agricultural conditions and farmer needs, contributing to long-term food security and sustainable development. Implementing these strategies benefits farmers by improving yields and reducing vulnerability to climate variability, while also preserving the environment through reduced emissions and sustainable practices.

ACKNOWLEDGEMENT

The authors are grateful to Sriwijaya University for providing the necessary resources and facilities for this research. We also extend our thanks to the Pusdiklat (Pusat Pendidikan dan Pelatihan) BMKG for their invaluable support in funding this study. The collaboration and support from both institutions were crucial for the successful completion of this research.

REFERENCES

Adam, M., T. Marwa, K. H. Thamrin, and A. Bashir (2017). Analysis of rice distribution in South Sumatera, Indonesia. *International Journal of Economics and Financial Issues*, **7**(3)

Altieri, M. A. and C. I. Nicholls. (2017). The adaptation and mitigation potential of traditional agriculture in a changing climate. *Climatic Change*, **140**(-); 33–45. Https://doi.org/10.1007/s10584-013-0909-y

Belay, B., G. Ambaw, Y. Amha, A. Tesfaye, S. Workneh, T. Terefe, A. Nigussie, Y. Sinshaw, S. Yigrem, and G. Kebede. (2023). *Climate-Smart Agriculture Training Guide*. Accelerating Impacts of CGIAR Climate Research for Africa

Cornelis, W., G. Waweru, and T. Araya. (2019). Building resilience against drought and floods: the soil-water management perspective. *Sustainable Agriculture Reviews 29: Sustainable Soil Management: Preventive and Ameliorative Strategies*, **-**; 125–142. Https://doi.org/10.1007/978-3-030-26265-5$_6$

Crentsil, A. O. and R. T. V. Karbo. (2021). Climate-Smart Agriculture (CSA) Adaptation Strategies of Farmers against Climate Change in Lawra Municipality, Upper West Region, Ghana. *Journal of Scientific Research and Reports*, **27**(2); 10–19. Https://doi.org/10.9734/jsrr/2021/v27i230355

Creswell, J. W. and J. D. Creswell. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications

Dejene, S. W., T. Terefe, B. Belay, Y. Amha, and T. D. Demissie. (2022). *Climate Smart Agriculture (CSA) Training Guide*. Accelerating Impacts of CGIAR Climate Research for Africa

Djufry, F., S. Wulandari, and R. Villano. (2022). Climate-smart agriculture implementation on coffee smallholders in Indonesia and strategy to accelerate. *Land*, **11**(7); 1112. Https://doi.org/10.1007/978-3-030-26265-5$_6$

Gattinger, A., A. Muller, M. Haeni, C. Skinner, A. Fliessbach, N. Buchmann, P. Mäder, M. Stolze, P. Smith, and N. E. H. Scialabba. (2012). Enhanced top soil carbon stocks under organic farming. In *Proceedings of the national Academy of Sciences*, volume 109. pages 18226–18231. Https://doi.org/10.1073/pnas.1209429109

Ghosh, M. (2019). Climate-smart agriculture, productivity and food security in India. *Journal of Development Policy and Practice*, **4**(2); 166–187. Https://doi.org/https://doi.org/10.1177/2455133319862404

Guest, G., A. Bunce, and L. Johnson. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field methods*, **18**(1); 59–82. Https://doi.org/10.1177/1525822X05279903

Iglesias, A. and L. Garrote. (2006). Adaptation strategies for agricultural water management under climate change in Europe. *Agricultural water management*, **155**(-); 113–124. Https://doi.org/10.1016/j.agwat.2015.03.014

Ingram, J. (2011). A food systems approach to researching food security and its interactions with global environmental change. *Food Security*, **3**(-); 417–431. Https://doi.org/10.1177/1525822X05279903

Kurgat, B. K., C. Lamanna, a. N. N. A. Kimaro, L. Manda, and T. Rosenstock. (2020). Adoption of climate-smart agriculture technologies in Tanzania. *Frontiers in sustainable food systems*, **4**(-); 55. Https://doi.org/10.3389/fsufs.2020.00055

Lipper, L., P. Thornton, B. M. Campbell, T. Baedeker, A. Braimoh, M. Bwalya, P. Caron, A. Cattaneo, D. Garrity, and K. Henry. (2014). Climate-smart agriculture for food security. *Food Security*, **4**(12); 1068–1072. Https://doi.org/10.1038/nclimate2437

Martinez-Feria, R. A. and B. Basso. (2020). Unstable crop yields reveal opportunities for site-specific adaptations to climate variability. *Scientific Reports*, **10**(1); 2885. Https://doi.org/10.1038/s41598-020-59494-2

Mathieu, J. A. and F. Aires. (2018). Assessment of the agro-climatic indices to improve crop yield forecasting. *Agricultural and Forest Meteorology*, **253**(-); 15–30. Https://doi.org/10.1016/j.agrformet.2018.01.031

Ngoma, H., A. Angelsen, S. Carter, and R. M. Roman-Cuesta. (2018). Climate-smart agriculture. *Transforming REDD*, **-**(-); 175. Https://doi.org/10.1016/j.landusepol.2021.105482

Odegard, I. Y. and E. V. D. Voet. (2014). The future of food—Scenarios and the effect on natural resource use in agriculture in 2050. *Ecological Economics*, **-**(97); 51–59. Https://doi.org/10.1016/j.ecolecon.2013.10.005

Orb, A., L. Eisenhauer, and D. Wynaden. (2001). Ethics in qualitative research. *Journal of nursing scholarship*, **33**(1); 93–96. Https://doi.org/10.1111/j.1547-5069.2001.00093.x

Poeplau, C. and A. Don. (2015). Carbon sequestration in agricultural soils via cultivation of cover crops–A meta-analysis. *Agriculture, Ecosystems Environment*, **-**(200); 33–41. Https://doi.org/10.1016/j.agee.2014.10.024

Raza, A., S. S. M. A. Razzaq, X. Zou, Z. X. Lv. Y, and J. Xu. (2019). Impact of climate change on crops adaptation and strategies to tackle its outcome: A review. *Plants*, **8**(2); 34. Https://doi.org/10.3390/plants8020034

Sardar, A., A. K. Kıanı, and Y. Kuslu. (2019). An assessment of willingness for adoption of climate-smart agriculture (Csa) practices through the farmers' adaptive capacity determinants. *Yuzuncu Yıl University Journal of Agricultural Sciences*, **29**(4); 781–791. Https://doi.org/10.29133/yyutbd.631375

Scherr, S. J., S. Shames, and R. Friedman. (2012). From climate-smart agriculture to climate-smart landscapes. *Agriculture Food Security*, **1**(-); 1–15. Https://doi.org/10.1186/2048-7010-1-12

Shaw, D. J. (2007). *Carbon sequestration in agricultural soils via cultivation of cover crops–A meta-analysis*. Springer. Https://doi.org/10.1057/9780230589780$_3$5

Smith, P., M. Bustamante, Ahammad, H. Clark, H. Dong, E. Elsiddig, H. Haberl, R. Harper, J. House, and M. Jafari. (2014). Agriculture, forestry and other land use (AFOLU). Technical report, Cambridge University Press. Https://doi.org/10.1057/9780230589780$_3$5

Syuhada, A., M. E. Armanto, A. Siswanto, M. Yazid, and E. Wildayana (2020). Food security and environmental sustainability on the South Sumatra Wetlands, Indonesia. *Systematic Reviews in Pharmacy*, **11**(3); 457–464. Https://doi.org/10.5530/srp.2020.3.58

Taylor, M. (2018). Climate-smart agriculture: what is it good for? *The Journal of Peasant Studies*, **45**(1); 89–107. Https://doi.org/10.1080/03066150.2017.1312355

Wandayantolis, W., D. Budianta, Yakup, and D. Gunawan. (2023). Investigating the Impacts of ENSO and IOD on Rice Productivity in South Sumatra, Indonesia. In *Proceedings of the International Conference on Agriculture*, volume -. -

Wandayantolis, W., D. Budianta, Yakup, and D. Gunawan. (2024). Assessing the Change of Agroclimatic Suitability for Rice Cultivation in South Sumatra, Indonesia. *AGRIVITA Journal of Agricultural Science*, **46**(2); 229–237. Http://doi.org/10.17503/agrivita.v46i2.4230

Wildayana, E. (2015). Formulating rice fields conversion control to oil palm plantations in tidal wetlands of South Sumatra, Indonesia. *Journal of Wetlands Environmental Management*, **3**(2); –

Williams, T. O., J. Kinyangi, M. Nyasimi, D. A. Amwata, C. I. Speranza, and T. Rosenstock. (2015). *Climate smart agriculture in the African context*. Feeding Africa

Zakari, S., M. Ouédraogo, T. Abasse, and R. Zougmoré. (2019). Farmer's prioritization and adoption of climate-smart agriculture (CSA) Technologies and Practices. *J. Agric. Environ. Sci*, **8**(-); 176–185. Https://doi.org/10.15640/jaes.v8n1a17

Zougmoré, R., S. Partey, M. Ouédraogo, B. Omitoyin, T. Thomas, A. Ayantunde, P. Ericksen, M. Said, and A. Jalloh. (2016). Toward climate-smart agriculture in West Africa: a review of climate change impacts, adaptation strategies and policy developments for the livestock, fishery and crop production sectors. *Agriculture Food Security*, **5**(-); 1–16. /https://doi.org/10.1186/s40066-016-0075-3

Zougmoré, R. B., P. Läderach, and B. M. Campbell. (2015). Transforming food systems in Africa under climate change pressure: Role of climate-smart agriculture. *Sustainability*, **13**(8); 4305. Https://doi.org/10.3390/su13084305

Assessing Climate-Smart Agriculture Adoption: Enhancing Rice Production Resilience in South Sumatra, Indonesia

ORIGINALITY REPORT

8%	7%	8%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	jurnal.feb-umi.id Internet Source	1%
2	smujo.id Internet Source	1%
3	"Food and Nutrition Security in the Kingdom of Saudi Arabia, Vol. 1", Springer Science and Business Media LLC, 2024 Publication	1%
4	Submitted to Sriwijaya University Student Paper	1%
5	"Climate Smart Agriculture", Springer Science and Business Media LLC, 2018 Publication	1%
6	"Board Diversity and Corporate Governance", Springer Science and Business Media LLC, 2024 Publication	1%
7	ouci.dntb.gov.ua Internet Source	1%
8	environmentportal.in Internet Source	1%
9	pdfs.semanticscholar.org Internet Source	1%
10	ueaeprints.uea.ac.uk Internet Source	<1%
11	watermark.silverchair.com Internet Source	<1%

Exclude quotes	Off	Exclude matches	< 1%
Exclude bibliography	On		