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Analysis of User Views of the Climate Information System in Indonesia

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Abstract

Climate information is important in decision making. Access to relevant and timely weather information is an important factor in increasing farmers' resilience to climate change. Information systems are considered essential for enhancing the ability of individuals, businesses and governments to adapt to change and climate change. Information users can use the information system to assist in making decisions about management adjustments to climate projections. Climate information should be communicated in languages understood by local farmers and linked directly to farm management decision-making processes to ensure information is timely and usable by small producers. The survey was conducted on the user's level of trust in the climate information system issued by the BMKG. No less than 59 respondents stated that the climate information obtained was very good, accurate and timely, received late, difficult to understand, diverse climate information did not reach all sectors. In order to remain productive in running the agricultural industry, accurate information is needed so that users can make optimal use of it. By knowing climate information, climate risks can be minimized.

Keywords: Climate Information System; Farmer; Survey

A. Introduction

Climate risk management (CRM) is a form of management, planning or steps taken to minimize the risks or impacts caused by the climate both in the short term and in the long term (as anticipatory steps that can be taken) (Young et al., 2012). The phenomenon of climate change has created uncertainty about weather and climate and has had an impact on the activities of people who rely heavily on weather forecasts to carry out their activities. The existence of the phenomenon of global climate change provides an opportunity for the emergence of disaster risks which can bring negative effects that are quite worrying. Good risk management can certainly minimize the negative impacts that can occur. The form of risk management related to the phenomenon of climate change can be carried out by optimizing the available climate information systems. Managing this risk requires adaptive management with intensive knowledge in policy making that can be actively informed to the public.

Climate information is very important in decision making. The four dimensions in improving climate information systems are: model agreement, projection range, higher spatial resolution and temporal scale, and increasing shorter time projections. Availability of climate information for the public is one way to reduce the risk of climate change impacts. However, the community has not optimized this information because they think the access system is too complicated (Khristanto et al., 2016). However, this climate information is often not used. This shows that there is a gap between the understanding of scientists as useful information and the understanding of users as

information that can be used in their decision making. Therefore, it is necessary to optimize climate information systems to reduce climate-related risks (Lemos et al., 2012). As an agricultural country, many Indonesian people work as farmers. In fact, not a few people who depend their source of income from the agricultural sector. The agricultural sector is a business sector that is dependent on climate factors. Therefore, valid information is needed to support agricultural businesses.

Access to relevant and timely weather information is an important factor in increasing farmers' resilience to climate change. Based on the research results, there is an increase in enthusiasm in increasing the dissemination of weather information to the farmers (Simon et al., 2021). Climate information should be communicated in a language that local farmers understand and linked directly to agricultural management decision-making to ensure that the information is timely and usable by smallholders (Antwi-Agyei et al., 2021). While society struggles to manage climate-related risks, increased vulnerability and the scourge of climate change have driven optimization efforts in climate services. Often provided in the form of tools, websites and/or newsletters, climate services involve the production, translation, transfer and use of timely climate information for community decision-making. Information systems are seen as essential to increasing the capacity of individuals, businesses and governments to adapt to climate change and variability (Vaughan et al., 2017). Information Users can use the information system to assist in making decisions regarding management adjustments in relation to climate forecasts.

Seasonal climate variability forecasts are historically based on statistical analysis of weather records. However, much has changed over the past two decades. Improved ability to estimate seasonal climate variability provides opportunities for the development of decision assistance systems. The main challenge faced by climate information system providers is to make forecasts based on global climate models that can be used at the local level. However, the emerging ability to probabilistically predict the coming season in terms of climate and its consequences for agricultural systems has begun to influence decision-making at many levels (Meinke dan Stone, 2005).

To create an integrated system, a continuous monitoring and information exchange system is needed. Early symptoms of extreme climatic phenomena must be recognized in time, so that measures can be taken to prevent very harmful effects. Therefore, it is necessary to conduct research on the impact of climate change on the agricultural sector in order to find strategies, models and innovations that can answer these challenges. The impact achieved in a very wide area is of course very diverse and information is needed to identify the condition of the impact (Aldrian, 2016).

Several studies on the usefulness of climate information for users in different industries show that the climate information received is inaccurate, delayed, confusing, and the diversity of climate information does not apply to different industries. By knowing climate information, the risks posed by climate can be minimized. However, the climate information provided must satisfy the end user. The power of climate information relies heavily on timeliness, accuracy, and responsiveness to needs based on actions taken. The information provided is expected to meet the needs of users, because information that does not meet the needs is information that is not appropriate (Haryoko, n.d.)

The agricultural sector is the most sensitive sector to the effects of extreme climate conditions. Addressing the impacts of extreme climates requires a valid strategy to establish national early warnings. With demographic pressures and developments in information technology, in the future it is necessary to have an extensive early warning system to respond to changes. Early warning systems must also be able to predict impacts and risks. The early warning system that was built is a combination of field observations, data processing and analysis as well as a system that is disseminated as a whole. .

A valid early warning system is required for appropriate adjustments. This system aims to provide forecasts and early warning. The forecasts produced aim to provide an overview of the impact that will also occur on the local climate, so that people can adapt more easily. In addition, the resulting early warnings can also represent risks that arise if adaptive actions are not taken. These adjustments can reduce potential losses and potentially provide optimal results (Fraisse et al., 2006; Meza et al., 2008).

The Impact Based Forcast (IBF), which has been carried out by the BMKG, is currently interpreted as a frequency climate system, such as climate data per 6 months, per year, 2 years and per 10 years needed by many industries. Currently, the IBF conducted by BMKG is still based on climate information for anything but not what kind of climate information system can be prepared for IBF for various needs. The six climate data standards need to consider several things, including: 1) Credibility, accurate predictions; 2) Legitimacy; predictions beyond the knowledge of common people; 3) Scale or coverage of predictions; Example: KATAM is given at the sub-district scale, but farmers think it is not suitable because farmers see it at the rice field scale; 4) Procedures; how the procedure is carried out; 5) Choice; the information system has sufficient information for alternative decisions; 6) Cognition; understanding is confusing due to changing formats (Meinke et al., 2006).

This analysis was carried out to see how far users (farmers) trust the climate information system from BMKG. This analysis is expected as an evaluation to climate information providers (BMKG) on improving the quality of information services provided to users. It is hoped that the results of the analysis can become a medium for evaluation so as to maximize the dissemination and utilization of information.

B. Research Method

The data obtained is based on the results of a questionnaire that was built using a Likert scale to measure a person's attitude and perception of an object. The questionnaire used in this study was a closed questionnaire with respondents' answers to choose immediately, a direct questionnaire using a multilevel scale. The cascade scale in this view uses a modified Likert scale with 4 (four) answer choices, namely strongly agree, agree, disagree, and strongly disagree. According to Sugiyono (2017) in this questionnaire there are 4 (four) alternative answers, namely: Strongly Agree (SS) with a score of 4, Agree (S) with a score of 3, Disagree (TS) with a score of 2, Strongly Disagree Agree (STS) with a score of 1 A four-choice scale Sometimes also used for Likert scale questions that force respondents to choose one of the poles because there is no “neutral” choice. The four-choice scale is also sometimes used as a Likert scale questionnaire asking the respondent to choose a pole of choice because there is no "neutral" choice. Because the scales sometimes pass through the middle pole between agree and disagree, that is "neutral". In this case, the respondent is forced to agree or disagree. These questions are intended to trick respondents into believing that they are not neutral or have no opinion.

The questionnaire was prepared with sixteen statements/questions related to the user's level of trust in the climate information system originating from the Meteorology, Climatology and Geophysics Agency (BMKG). The questionnaire was poured into an e-form that can be accessed by users online (https://ipb.link/survey-sistem-informasi-iklim). Respondents who filled out the questionnaire were users of climate information (farmers), totaling 59 people.

In the data collection process, it is carried out using a survey method that aims to obtain facts and find factual information. Descriptive method with a quantitative approach is the method used in this study. It is called descriptive research because it collects information about the indications that appear during the research. Then it is said to be a quantitative method because good research from the beginning of the research

collects data, analyzes and draws conclusions using formulas, data in the form of numbers, calculations and measurements. The analytical method used is descriptive analysis. The analytical method used is descriptive analysis. Descriptive analysis is a statistical method by analyzing data by describing or describing the data that has been collected (Sugiyono, 2017).

C. Discussion

The results of the questionnaire that was given to 59 respondents were obtained as follows:

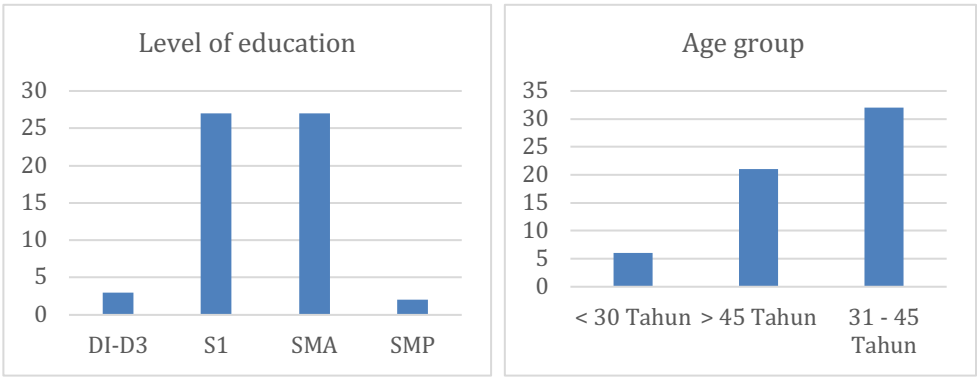

Figure 1 Graph of Respondents' Education Level and Age Group

The number of respondents who filled out the questionnaire based on their level of education was dominated by undergraduate and high school students. respectively 46% Bachelor (Strata-1), 46% SMA, 4% D1-D3 and 3% SMP. Based on the age of the respondents, 54% came from people aged 31-45 years. Furthermore, 36% are from the age group over 45 years and the remaining 10% are from the age group under 30 years.

Based on the figure above, users of climate information systems are dominated by people with undergraduate and high school educational backgrounds. Based on the respondents who filled it out, it can be said that users already have the ability to interpret climate information properly. Furthermore, based on age, 50% of respondents were in the age range of 31-45 years, and 30% in the age range above 45 years. This implies that the majority of respondents who use climate information fall into the adult category.

Table 1. User Survey Results of the BMKG Climate Information System

No	Statement	Score
1	As a provider of climate information, BMKG is a credible institution	3.80
2	The Information Provider Agency (BMKG) publishes climate forecasts on an ongoing basis	3.63
3	There is a climate observatory in your city/area where you can easily get information about climate forecasts	3.32
4	The climate information provided is accurate and representative of your region and surroundings	3.28
5	Forecast data/climate data as desired	3.28
6	Current analysis of climate data is very comprehensive	3.25
7	Forecast data/climatic data of good quality	3.37
8	Apart from climate data from BMKG, do you also get climate data systems from other agencies?	2.68
9	Available climate data (BMKG) in easy-to-understand language.	3.45
10	Available climate information (BMKG) according to your needs.	3.33
11	After receiving climate data (BMKG) you will receive additional information so you can apply/track the results obtained.	3.38
12	Until now, I feel that translating climate data (BMKG) is still difficult	2.83

13	Climate information dissemination/disclosure (BMKG) is carried out well (periodically)	3.27
14	The climate information provided is real time	3.27
15	You feel the completeness of climate information and data (BMKG) has increased in the last 3 years.	3.37
16	You have felt better changes over the last 3 years in terms of data quality and climate information (BMKG).	3.33

Based on the table, several statements regarding user responses regarding the performance of the climate information system were obtained from the BMKG. In statements 8 and 12, the score is not good. Statement 8 states that users use climate information other than that issued by BMKG, and statement 12 argues that translations related to information systems issued by BMKG are still difficult for users to understand.

These two statements are related to one another, namely the presence of obstacles related to the difficulty of translating/understanding the information system from the BMKG, so that users feel they need additional information regarding climate forecasts. But in some reserves with good results, such as the 13th and 14th reserves regarding the dissemination of information that is carried out regularly in real time, this means that information about climate is received by users regularly and at the right time.

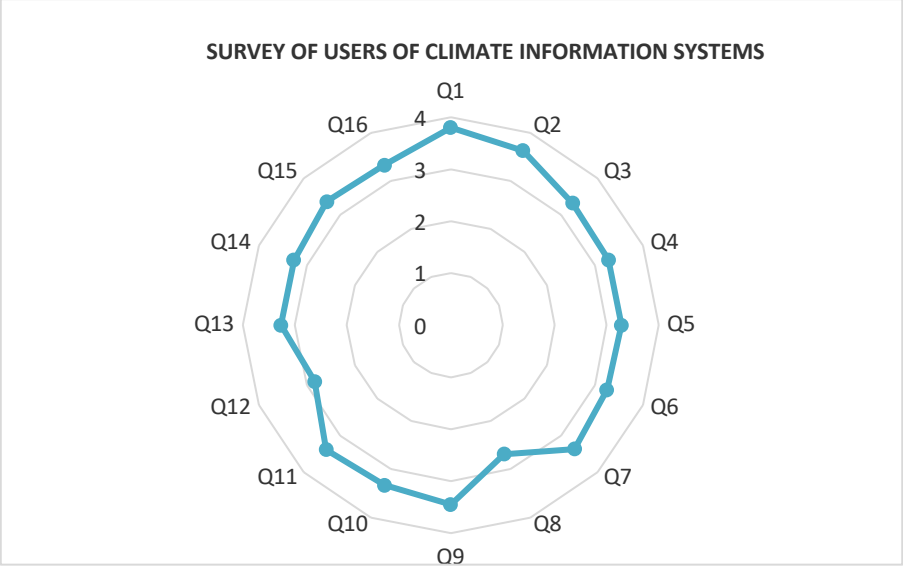

Figure 2 Graph of a User Survey on the BMKG Climate Information System

Climate information system is a concept of how the flow of information from observation, analysis, processing and data storage in database form can be transmitted to users. An information is said to be valuable if its benefits are more effective than the cost of obtaining it and most of the information cannot be precisely estimated in terms of monetary value, but its effectiveness can be estimated.

The intensity of information use refers to how frequently users use the information system. In this case, it is important to distinguish whether the use is an unavoidable necessity or voluntary. Information users, especially for climate information systems, vary, but in this study the focus is on the general public, such as farmers. Information system user satisfaction is in accordance with the feedback and feedback generated by users after using the information system. The user's attitude towards the information system is a subjective criterion of user satisfaction with the information used. The level of user information is determined by comparing the predicted results of satisfaction from the delivered information system with the actual conditions that occur. Identical or exact results will result in a high level of satisfaction, but if the predicted results are far from actual conditions, this is a form of user

dissatisfaction. In addition to the accuracy of the information provided, real time also affects the level of user satisfaction. Sometimes the information reaches the user too late, so that the existing information becomes useless.

Information is said to be of quality if it is relevant to the bearer. The right measure of value will be seen from the answer to the question "how is the message used to solve problems (decision making)?" Information will be relevant if it is useful for its bearer. The relevance of information for each person is different. Meanwhile, information can be considered accurate if it is impartial or misleading, free from error and must clearly reflect its intent. Inaccuracies can occur because the source of information (data) is disturbed or intentionally destroys or changes the original data. Accurate data is an important aspect in the data collection process.

Information can be said to be timely if the information is generated from a data processing whose arrival should not be late (outdated). Information that arrives late will not have good value, so if it is used as a basis for decision making it can cause errors in the actions to be taken. The need for timely information is what will ultimately lead to high information value. This is understandable because the speed of retrieving, processing and sending information requires the support of the latest technology.

Through the data generated, data users can analyze it for various purposes. Data users should no longer worry about the validity of data. Given that they will focus on other things that are the object of research. From the government's point of view, data accuracy is no less important. Through accurate data, policies that are right on target to develop a country can be formulated.

Through the research results obtained information that the data user respondents are dominated by those with middle and above education. This result is related to the age of the data user. Through these results the phenomenon is obtained that academics tend to seek, identify, and analyze climate data for various purposes. The knowledge and theory obtained is often tested with data to clarify phenomena.

Currently BMKG is the only government institution that produces climate-related data. Based on the survey results, it is known that the majority of data users still believe that the BMKG is a credible state institution. This condition is certainly related to various aspects, including variety, quality, time, and data presentation. These results are also consistent through information from respondents that they predominantly use the BMKG as a source of climate-related data and information.

Timeliness in data publicity is important in the process of presenting data. Data generated by BMKG as a credible institution that provides data tends to be timely. Timeliness in presenting data will have a major impact on data users in following up on the goals to be achieved. Accordingly, the quality of the data produced regarding climate also tends to be good. An input into an existing climate information system. With the results from user responses related to the climate information system received, it can be focused on designing/designing an information system that is easy for users to understand so that the quality and usefulness of the information system issued is getting better and more reliable.

In Indonesia, the adoption of climate forecasting results by farmers is still very low, making it increasingly difficult for farmers in areas that are vulnerable to extreme climate events to get out of economic difficulties. The results of a survey conducted in several districts in Java indicate that the cause of the low ability to anticipate extreme climate events is due to the level of forecasting ability that is still not good and the level of farmer adoption of forecast results is still very low. Therefore, it is necessary to improve the prediction accuracy and user adoption rate. For this reason, climate information needs to be disseminated to farmers, because information will be used if the user knows that the information will provide economic benefits (Surmaini et al., 2006).

The role of climate information in agriculture, among other things, is to determine planting times and plan plant pest control that is expected to occur. However, farmers as direct actors in the agricultural sector do not fully understand and use science-based climate information provided by the Meteorology, Climatology and Geophysics Agency. Farmers in their farming practices tend to rely on local wisdom to decide when to plant and what varieties to plant. Along with the phenomenon of climate change that is happening all over the world, Indonesia is no exception, making weather and climate situations difficult to predict. It also empowers local climate intelligence to provide more clues about when to plant and which varieties are appropriate to plant during the growing season. Climate change has an impact on changes in precipitation patterns, both in duration and intensity. In addition, along with climate change, the frequency of natural disasters related to hydrometeorological disasters is increasing. This threatens agricultural productivity with the risk of loss to farmers (Tarmana & Ulfah, 2021).

Farmers have difficulty determining planting time due to changes in weather patterns compared to usual. It is difficult for farmers to determine planting time because they do not know weather information. Farmers are struggling to determine when to start planting because of changing weather, which causes lower crop yields. Farmers' lack of understanding of climate information is suspected to be the cause of farmers' difficulties. The existence of rainfall instability has an impact on the agricultural industry, in particular a decrease in agricultural productivity, and even loss of crop yields. Farmers' lack of understanding of climate information is the cause of difficulties for farmers to start farming

Responding to future challenges, BMKG continues to adapt and improve institutional governance. These results were confirmed from survey results which showed improvement in the last 3 years. This adaptation is of course based on world climate data and is consistent every year, so that it can be compared across time and between regions.

D. Conclusion

The impact of climate change can affect the socio-economic conditions of society. Indonesia as an agricultural country has a dominant population as farmers. To maintain the productivity of the performance of the agricultural sector, accurate information is needed so that it can be used optimally by users. Based on the results of a survey on the performance of government agencies in charge of climate data, data users have assessed it as good. Studies are needed regarding the relevance of the data needed, so that the use of data can be effective and on target.

References

Aldrian, E. (2016). Sistem peringatan dini menghadapi iklim ekstrem. *Jurnal Sumberdaya Lahan*, *10*(2), 79–90.

Antwi-Agyei, P., Dougill, A. J., & Abaidoo, R. C. (2021). Opportunities and barriers for using climate information for building resilient agricultural systems in Sudan savannah agro-ecological zone of north-eastern Ghana. *Climate Services*, *22*, 100226. https://doi.org/https://doi.org/10.1016/j.cliser.2021.100226

Fraisse, C. W., Breuer, N. E., Zierden, D., Bellow, J. G., Paz, J., Cabrera, V. E., Garcia y Garcia, A., Ingram, K. T., Hatch, U., Hoogenboom, G., Jones, J. W., & O'Brien, J. J. (2006). AgClimate: A climate forecast information system for agricultural risk management in the southeastern USA. *Computers and Electronics in Agriculture*, *53*(1), 13–27. https://doi.org/https://doi.org/10.1016/j.compag.2006.03.002

Haryoko, U. (n.d.). Identifikasi Kekuatan dan Kelemahan Komponen Sistem Informasi Iklim (strength And Weakness Identification Of Climate Information Component). *Agromet*,

22(2), 246582.

Khristanto, A., Yesiana, R., Hidayati, I. Y., & Septiarani, B. (2016). The Development of Climate Information System (Sistem Informasi Iklim–SIKLIM) in Supporting Coastal Communities Activity: Process and Implementation. *Enhancing Resilience: Bridging Knowledge and Policy for Cities and Regions*, 1.

Lemos, M. C., Kirchhoff, C. J., & Ramprasad, V. (2012). Narrowing the climate information usability gap. *Nature Climate Change*, *2*(11), 789–794. https://doi.org/10.1038/nclimate1614

Meinke, H., Nelson, R., Kokic, P., Stone, R., Selvaraju, R., & Baethgen, W. (2006). Actionable climate knowledge: from analysis to synthesis. *Climate Research*, *33*(1), 101–110.

Meza, F., Hansen, J., & Osgood, D. (2008). Economic Value of Seasonal Climate Forecasts for Agriculture: Review of Ex-Ante Assessments and Recommendations for Future Research. *Journal of Applied Meteorology and Climatology*, *47*, 1269–1286. https://doi.org/10.1175/2007JAMC1540.1

Simon, W. J., Krupnik, T. J., Aguilar-Gallegos, N., Halbherr, L., & Groot, J. C. J. (2021). Putting social networks to practical use: Improving last-mile dissemination systems for climate and market information services in developing countries. *Climate Services*, *23*, 100248. https://doi.org/https://doi.org/10.1016/j.cliser.2021.100248

Sugiyono, P. D. (2017). Metode penelitian bisnis: pendekatan kuantitatif, kualitatif, kombinasi, dan R&D. *Penerbit CV. Alfabeta: Bandung*, *225*.

Surmaini, E., Boer, R., & Siregar, H. (2006). Pemanfaatan Informasi Iklim untuk Menunjang Usaha tani Tanaman Pangan. *Jurnal Tanah Dan Iklim*, *24*.

Tarmana, D., & Ulfah, A. (2021). Peningkatan Pemahaman Informasi Iklim Melalui Sekolah Lapang Iklim (SLI) Bagi Petani. *JMM (Jurnal Masyarakat Mandiri)*, *5*(2), 798–809.

Vaughan, C., Dessai, S., Hewitt, C., Baethgen, W., Terra, R., & Berterretche, M. (2017). Creating an enabling environment for investment in climate services: The case of Uruguay's National Agricultural Information System. *Climate Services*, *8*, 62–71. https://doi.org/https://doi.org/10.1016/j.cliser.2017.11.001

Young, C., Soto, D., Bahri, T., & Brown, D. W. (2012). Building resilience for adaptation to climate change in the fisheries and aquaculture sector (p. 346).