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CLIMATE CHANGE FACTORS AFFECTING THE PRODUCTIVITY OF BAMBOO WEAVING CRAFTS AT UD. WIDYA HANDYCRAFT

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ABSTRACT

Bamboo crafts are an integral part of local culture and history, demonstrating the ingenuity and expertise of the community in sustainably utilizing natural resources. Gintangan villagers have a long history of making a living and creating beautiful bamboo crafts. Mr. Widodo, 66, from Gintangan Village, Blimbingsari Sub-district, Banyuwangi Regency, has contributed to this tradition. Although his initial aspiration was to become a public school teacher, in 1991 Mr. Widodo established UD. Widya Handycraft, a bamboo weaving company, after recognizing the potential of bamboo weaving crafts in Gintangan Village, which has distinct characteristics compared to other villages. The primary objective of this research is to examine the impact of climate change on the productivity of UD. Widya Handycraft and to analyze the specific adaptation strategies that artisans adopt in response to these challenges. This qualitative study uses a descriptive approach by observing production processes, conducting in-depth interviews, and directly documenting the bamboo weaving activities of UD. Widya Handycraft in Gintangan Village, Blimbingsari District, Banyuwangi Regency. Specifically, the study aims to capture the experiences, personal perceptions, and distinct adaptation methods used by artisans to address climate-related challenges. The results show that climate change has a significant impact on the production of woven bamboo handicrafts. As an adaptation effort, craftsmen store raw material stocks, use artificial dryers, and diversify product types. The findings emphasize the need for sustainable bamboo resource management, as

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well as government strategies and policies, to support the long-term viability of bamboo handicraft businesses amidst uncertain climate conditions.

INTRODUCTION

The physical skills and creativity of artisans form the foundation of the bamboo craft industry. According to Indonesian bamboo expert Dr. H. Widjaja, M.Sc. (2024), bamboo crafts are deeply embedded in local culture and history, reflecting the community's ingenuity and sustainable use of natural resources. The residents of Gintangan Village possess a longstanding tradition of producing bamboo crafts for their livelihoods. One notable artisan, Mr. Widodo, aged 66, from Gintangan Village in Blimbingsari Sub-district, Banyuwangi Regency, initially aspired to become a public school teacher.

In 1991, Mr. Widodo established UD. Widya Handycraft, a bamboo weaving company, after seeing the great potential of bamboo weaving crafts in Gintangan Village. This village has different characteristics compared to other villages. Five permanent workers and 10 part-time workers, or mobile crafters, assisted Mr. Widodo at that time. However, his business encountered obstacles. There were a number of obstacles that Mr. Widodo had to overcome as a beginner, especially in terms of marketing and capital. Perum Perhutani's Community Partnership Program (PKBL, previously PUKK) was the next avenue he explored for financial support. Perhutani's Forest Management Unit (FMU), Banyuwangi Selatan, officially accepted Mr. Widodo as a partner in 1993.Thanks to his status as a foster partner, Mr. Widodo is entitled to a low-interest loan. In addition, he has many opportunities to showcase his work to the market as he is often invited to exhibit in various cities, at the district, regional and national levels. During these exhibitions, Mr. Widodo managed to attract many clients, not only in Banyuwangi, but also in Jember, Surabaya, Malang, Yogyakarta and Bali. Even the United States, Europe and Malaysia became his target markets. Mr. Widodo devoted a lot of time and energy to his bamboo weaving business, and as a result, his monthly turnover increased from 10 million rupiah to 60 million rupiah.

In 2011, Mr. Widodo applied for early retirement from the civil service to devote more time to developing his business. To make Gintangan Village more recognizable to the public, he is determined to continue producing high-quality woven bamboo goods for all. Therefore, Mr. Widodo never stops innovating and coming up with fresh ideas for products that people love. Part of their dedication to providing the best service is to ensure that the quality of their products is always high.

The products, sold under the Widya Handycraft label, consist of a wide array of arts and crafts made mostly from bamboo, a staple in their supply chain. They create various items, such as food covers, newspaper holders, fruit baskets, cake trivets, tissue holders, and lampshades. The production process is mostly performed manually with basic tools such as saws, cutting knives, and draw knives to maintain high quality.

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holders, and lampshades. The production process is mostly done manually with basic tools such as saws, cutting knives, draw knives, and the like to keep the quality high.

Based on the latest research on the interaction between the world's atmosphere and oceans, the Climate Outlook (2025) typically includes forecasts of climate conditions for 2025. These data include El Niño, Southern Oscillation (ENSO), and Indian Ocean Dipole (IOD) forecasts, as well as air temperature and precipitation for 2025. These forecasts were also compared to the 30-year long-term average (called "normal" in this publication) and 2018 rainfall totals.

According to the atmospheric dynamics outlook, the ENSO index is expected to fluctuate between -0.66 and 0.0 in 2025. This region is part of the weak-to-neutral La Niña phase. The weak La Niña phase, which began in 2024 and is expected to continue until January-February-March 2025, is expected to continue to cause global climate change. By mid-2025, the La Niña phenomenon will enter a neutral phase and remain so until the end of the year. In contrast, indicators ranging from -0.42 to +0.22 indicate that the IOD will remain neutral in 2025.

By 2025, the total annual rainfall is expected to remain within the normal range, although some areas have the potential to experience rainfall exceeding 2,500 mm/year. Almost all areas of Aceh, North Sumatra, West Sumatra, western Riau, Jambi, Bengkulu, South Sumatra, Bangka Belitung, Banten, East Java, central and southern Sulawesi, Bali, East Nusa Tenggara, Papua, and most of Kalimantan are expected to experience rainfall exceeding 2,500 mm/year. A small part of West Java is predicted to experience rainfall exceeding 2,500 mm/year.

The 2025 weather forecast, which is expected to be normal with a small chance of an early La Niña, provides significant support for initiatives aimed at improving food security in the region. Forecasts for 2025 indicate that rainfall will be in the average to slightly above-average range, which bodes well for initiatives to increase crop yields in food-producing regions. In terms of agriculture, areas that are expected to experience less rainfall than normal include parts of Sumatra and Java, a small part of Kalimantan, a small part of East Nusa Tenggara, a small part of Sulawesi, a small part of Maluku, and a small part of Papua, Indonesia.

Climate change poses a serious threat to the creativity and productivity of Indonesian workers. Specifically, this study questions whether artisans have implemented adequate adaptation plans to anticipate the impacts of climate change and help their employees adapt to the new normal. The author bases her argument on Parsons' (2003) theory of productivity and climate change. According to Parsons, work productivity is affected by various factors, including temperature, humidity, and lighting. Hot and humid weather inhibits focus and productivity, whereas comfortable weather increases efficiency and productivity.

Given the unpredictable weather, this study aims to provide suggestions or solutions that can be implemented by Gintangan Village crafters to maintain their production levels. Relevant parties can utilize this research to inform the development of policies and programs that will help bamboo crafters in this hamlet maintain their productivity and innovation while expanding their market.

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LITERATURE REVIEW

This literature review aims to map the theoretical and empirical concepts relevant to the analysis of climatic factors affecting productivity, as well as to identify existing GAPs. Based on previous research, several researchers have examined the influence of factors on productivity; however, there are still gaps in understanding the changes in climate factors that affect productivity.

Therefore, the author will further examine the theoretical and empirical concepts relevant to the analysis of climate factor changes and identify the implications of this research to find solutions to remain productive and innovate despite the constraints of changing climate factors that change all the time. This section explains the analytical approach used, whether qualitative or quantitative, respondent/case profile, sample size and determination, data collection method, variable operationalization, and analysis method.

Rising average temperatures, changing rainfall patterns, and more frequent and extreme weather events are symptoms of climate change, which have created serious problems for the agricultural industry. Research has shown that as temperatures rise, evapotranspiration increases, and plants experience more thermal stress, leading to lower crop yields (Gusti Rusmayadi, 2024).

Wheat production is severely affected by climate change, mainly due to rising temperatures, shifting rainfall patterns, and extreme weather events. According to research, wheat yields can drop by 6-10% with just a 1°C increase in temperature. This is particularly true in tropical and subtropical regions. To maintain the stability of the world's food supply and mitigate the negative impacts of climate change, the study found that the adaptation of new agricultural technologies and techniques is essential (Ninasari, 2024).Maize (Zea mays L.) has several uses besides food. Despite the ups and downs in production and productivity, Malang District remains one of the top maize-producing districts in East Java. Climate change due to global warming is one of the factors contributing to the unpredictability of Indonesia's maize yields (Herlina, 2019).

The industry is now faced with the enormous problem of climate change, which poses a serious threat to the sustainability of the food supply owing to variables such as changing rainfall patterns and overall global warming. Persistent climate change is placing farmers worldwide in an increasingly difficult position as they must deal with more intense and unpredictable weather. Extreme heat events caused by climate change are altering the weather in many areas of the world, including agricultural regions. A major concern that could affect cropping and harvesting cycles is the increasing intensity and unpredictability of rainfall (Aziz, 2025).

The increasingly unstable climatic conditions in Malang Regency have disrupted rice productivity. Studies on the effect of climate change are very important to be carried out in order to determine the productivity of rice plants. Climatic factors, such as rainfall, temperature, and light intensity, are important components in the production of rice plants. Therefore, it is necessary to assess the relationship between climatic factors and the productivity of rice plants (Akbar Hidayatullah, 2023).Climate change poses a serious challenge to the agricultural sector in Southeast Asia, but also provides an opportunity to develop more resilient, adaptive, and sustainable agricultural systems. Through strong collaboration, technological innovation, and progressive policies, the region's agricultural sector can become a driving force in achieving food security, economic prosperity, and

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environmental sustainability for the people of Southeast Asia (Lumongga Sari Siregar, 2024).

RESEARCH METODE

This qualitative study aims to learn more about the impact of weather on UD's bamboo handicrafts. Widya Handycraft. This project aimed to investigate how artisans deal with the impacts of climate change by collecting first-hand accounts through in-depth interviews and observations. The results of this study are anticipated to provide insights for company managers and artisans to optimize production processes and identify new solutions to climate-related constraints. To better understand, solve, and predict the problem, the researcher used a descriptive analysis method to describe, interpret, and understand qualitative phenomena or data without using numbers or statistics.

This study is an organized and methodical effort to find solutions to predetermined research questions. This research is qualitative and descriptive, focusing on bamboo handicrafts UD. Widya Handycraft in Gintangan Village, Blimbingsari Sub-district, Banyuwangi Regency, using direct observation, interviews and recording. The findings of this study include audio recordings of interviews, pictures, and other data that may be used for future research.

RESEARCH RESULTS AND DISCUSSION

RESEARCH RESULTS

This research uses a qualitative descriptive analysis method used on data on the knowledge and attitudes of crafters with climate change, as well as the impacts caused by climate change. Based on the results of interviews that researchers have conducted with participants of UD. Widya Handycraft participants are as follows:

a. Influence of seasonal patterns

Climate change can negatively impact the productivity of bamboo-weaving crafts, mainly through changes in bamboo availability and quality. Bamboo quality issues, such as increased moisture content and reduced strength, can complicate the weaving process and reduce the quality of the final product. In addition, changes in rainfall patterns and extreme temperatures can disrupt the growth and availability of bamboo, which in turn affects the supply of raw materials for crafts. Erratic rainfall makes it difficult to predict bamboo harvests. One respondent stated:

"The rains used to come around October, but now it is sometimes delayed until March, so the bamboo can only be harvested late" (respondent 1)

"During the rainy season, it is difficult to dry the bamboo because there is no sunlight" (Respondent 2).

b. Temperature increase and quality

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The daily increase in temperature also greatly affects product quality and viability. This resulted in faster drying of the bamboo. The bamboo dries quickly, cracks when weaving, and the color appears pale. One respondent stated:

"If it is hot, the bamboo will dry quickly but crack when weaving" (respondent 1)

"Material that is too dry reduces the image value of the product" (Respondent 2).

c. Craftsmen's adaptation strategies

The following strategies were employed by participants to reduce the negative impact of climate change factors on the productivity of woven bamboo crafts:

1. Strategies on Raw Materials

   Bamboo stock management: Create a well-ventilated raw material storage warehouse to prevent damage due to extreme humidity or rain
   - Controlled Drying:
     During the rainy season, the participant said
     "During the rainy season, I take the initiative to dry the raw materials more, so that later when the rainy season arrives we can still produce according to orders".
     "Vice versa, during the hot season, the raw materials will dry quickly, so before weaving we re-moisturize them".
   - Flexible scheduling:
     Adjusting the production schedule to the weather forecast, especially for the drying and smoothing stages, is necessary.
2. Strategies on Product Quality
   - Protective coating :
     Using anti-mold and anti-termite coatings or finishes to extend product durability
   - Strict quality control:
     Increase the quality inspection stages so that the product is not quickly damaged due to moisture
3. Economic & Marketing Strategy
   - Market diversification:
     Selling products online so that they still have income even if distribution is disrupted by extreme weather
   - Collaboration between craftsmen:
     Form a cooperative to share raw materials and resources when supply is disrupted

Discussion

Based on the results of the study, it shows that climate change has a significant impact on the productivity of woven bamboo crafts. An increase in air temperature can reduce the quality of bamboo fibers, making them more brittle and prone to cracking. Erratic changes in rainfall patterns cause delays in harvesting and difficulties in drying

raw materials.

The combined impact of these factors can reduce artisan productivity by 10 - 20% in seasons with significant weather anomalies, resulting in reduced income. As an adaptation effort, craftsmen store raw material stocks, conduct planned drying, and diversify product types. These findings emphasize the need for sustainable bamboo resource management and government strategies and policies to ensure the sustainability of bamboo craft businesses amidst uncertain climate change.

CONCLUSION

This research is motivated by the problem of declining productivity of woven bamboo crafts due to climate change. The aim was to examine the climate actors affecting productivity, as well as identify the impacts and adaptation strategies that can be implemented by artisans. The study findings outlined that increasing air temperatures, changing rainfall patterns and the frequency of extreme weather events have a direct impact on the quality and availability of bamboo raw materials. These conditions cause delays in the production process, reduced product quality, and reduced production quantities of up to 20% during extreme weather anomalies.

This fact is obtained from participants through interviews and direct observation, so that conclusions are drawn logically and honestly according to the findings. Based on these results, operational steps are suggested by way of, raw material management by harvesting in the optimal season and adequate storage to deal with the long dry season or prolonged rain, product diversification so that production continues despite varying bamboo quality, utilization of artificial drying technology to reduce dependence on weather during the production process. By implementing these measures, the sustainability of the bamboo weaving craft business can be better maintained despite the challenges of climate change.

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