MODEL FOR SMALL ENTERPRISES INNOVATION ON CLIMATE CHANGE
AND TOURISM INDUSTRY: LEARNING FROM THE TRADITIONAL
WEAVING INDUSTRY IN SUMBA

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ABSTRACT

Purpose: This research aims to provide an overview of the adaptation strategy of production process innovation in the small-scale weaving industry in Sumba Island, Indonesia. The research is used to address climate change, and also relevant to the context of the tourism industry in the region.

Theoretical framework: All business organizations face various risks that might arise from changes in the external macro and micro environment. One of the significant changes in the external macro-environment is climate change. Climate change and its derivative impacts on business activities need to be managed properly by adapting innovations in the production process. Various studies on the impact of climate change on business activities are more focused on conventional measures to gauge business risks which are more responsive and focused on large companies. Few studies are conducted on small and traditional businesses related to strategic actions in dealing with climate change and tourism, especially non-agricultural businesses. This research is carried out with the framework of making adaptation strategies to deal with climate change and tourism.

Methods: This study employed exploratory qualitative research involving 20 informants of ikat weaving craftsmen. The research was conducted in Kambera District in July 2021. The qualitative data in this study were obtained by semi-structured in-depth interviews with the participants. The main criterion in determining the respondents is the length of the business run by the traditional weavers. The main interview questions were about the participants’ understanding of climate change and its impact on their business, as well as what strategic actions have been taken related to innovation in the production process.

Findings: The study found that while most traditional weavers of Sumba textiles rely on status quo technology, some strategies emerged to adapt to climate uncertainty in weaving production to offer valuable products to the tourism industry. The authors also identify three benchmarks of climate adaptation measures by the traditional weavers.

Practical implications: The results of this study propose a production process innovation model related to climate change adaptation by ikat craftsmen to capture opportunities for tourism development by offering products that maintain cultural value while having high economic value. By all means, this model needs to be approached more deeply, either by conducting qualitative or quantitative exploratory studies.

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Originality/Value: The originality lies in its emphasis on the model of strategic actions toward climate change and the tourism industry. Furthermore, it improves the field's originality and value by shedding light into competitive business aspects that allow the industry to become a robust economic tourist attraction for the region, attracting tourists with its high-quality products. The emphasis on cultural values in the process of making Sumba ikat weaving adds a rich dimension to local culture, enriching the experience of tourists interested in the uniqueness of regional culture. Thus, the local economy can be strengthened via the increased tourism in Sumba.

Keywords: ikat industry, tourism industry, small enterprises, macro and micro environment, adaptation strategy, climate change, sustainability, economy and business.

MODELO PARA A INOVAÇÃO DAS PEQUENAS EMPRESAS NA INDÚSTRIA DE MUDANÇAS CLIMÁTICAS E TURISMO: APRENDENDO COM A INDÚSTRIA TRADICIONAL DE TECELAGEM EM SUMBA

RESUMO

Objetivo: Esta pesquisa tem como objetivo fornecer uma visão geral da estratégia de adaptação da inovação do processo de produção na indústria de tecelagem em pequena escala na Ilha de Sumba, Indonésia. A pesquisa é usada para abordar as mudanças climáticas, e também relevante para o contexto da indústria do turismo na região.

Estrutura teórica: Todas as organizações empresariais enfrentam vários riscos que podem surgir de mudanças no macro e microambiente externo. Uma das mudanças significativas no macro-ambiente externo é a mudança climática. As alterações climáticas e os seus efeitos derivados nas atividades empresariais devem ser geridas de forma adequada, adaptando as inovações no processo de produção. Vários estudos sobre o impacto das alterações climáticas nas atividades empresariais estão mais centrados em medidas convencionais para aferir os riscos empresariais, que são mais sensíveis e centrados nas grandes empresas. São realizados poucos estudos sobre pequenas e tradicionais empresas relacionadas com ações estratégicas para lidar com as mudanças climáticas e o turismo, especialmente empresas não agrícolas. Essa pesquisa é realizada no âmbito da elaboração de estratégias de adaptação para lidar com mudanças climáticas e turismo.

Métodos: Este estudo empregou pesquisa qualitativa exploratória envolvendo 20 informantes de tecelagem de ikat artesanais. A pesquisa foi realizada no distrito de Kambera em julho de 2021. Os dados qualitativos deste estudo foram obtidos por meio de entrevistas semiestruturadas e aprofundadas com os participantes. O principal critério para determinar os respondentes é a duração do negócio gerido pelos tecelões tradicionais. As principais perguntas da entrevista foram sobre a compreensão dos participantes sobre as mudanças climáticas e seu impacto nos negócios, bem como quais ações estratégicas foram tomadas em relação à inovação no processo de produção.

Constatações: O estudo constatou que, embora a maioria dos tecelões tradicionais de tecidos de Sumba dependa da tecnologia status quo, algumas estratégias surgiram para se adaptar à incerteza climática na produção de tecelagem a fim de oferecer produtos valiosos à indústria do turismo. Os autores também identificam três referências de medidas de adaptação climática feitas pelos tecelões tradicionais.

Implicações de praticidade: Os resultados deste estudo propõem um modelo de inovação de processo de produção relacionado à adaptação às mudanças climáticas por artesãos de ikat para capturar oportunidades de desenvolvimento turístico oferecendo produtos que mantêm o...
valor cultural e que têm alto valor econômico. Este modelo deve ser abordado de forma mais aprofundada, quer através da realização de estudos exploratórios qualitativos ou quantitativos.

Originalidade/valor: A originalidade reside na sua ênfase no modelo de ações estratégicas para as alterações climáticas e à indústria do turismo. Além disso, melhora a originalidade e o valor do campo, lançando luz sobre aspectos comerciais competitivos que permitem que a indústria se torne uma atração turística econômicamente robusta para a região, atraindo turistas com seus produtos de alta qualidade. A ênfase em valores culturais no processo de fabricação de tecelagem de Sumba ikat acrescenta uma rica dimensão à cultura local, enriquecendo a experiência dos turistas interessados na singularidade da cultura regional. Assim, a economia local pode ser reforçada através do aumento do turismo em Sumba.

Palavras-chave: indústria de ikat, indústria do turismo, pequenas empresas, macro e micro ambiente, estratégia de adaptação, mudanças climáticas, sustentabilidade, economia e negócios.

1 INTRODUCTION

Climate change has become a global issue that has been frequently discussed in recent decades, emphasizing the importance of reducing and managing the risk of extreme events and natural disasters in a changing climate (IPCC, 2014; Jiang & Li, 2021; Murray & Ebi, 2012; Paul et al., 2017; Pryor, 2013). From the perspective of developing countries, climate change is the most complex environmental and social challenge, especially when linked to sustainable development (Kalele et al., 2021). As one of the biggest global challenges in today’s world, climate change affects various sectors, such as agriculture, trade, and commerce. Companies face the risk of changes in the ecological environment that have an impact on their daily business operations (Beermann, 2011; Herrmann & Guenther, 2017).

Various studies have been carried out to give serious attention to the adaptation to environmental changes as an anticipatory action and planning process. The results of these studies can be seen in the modeling of new policies, technological innovations, and development interventions that are still based on a "business as usual" approach that ignores the environmental adaptation behavior of creative and socio-cultural technical actors (Crane et al., 2011; Herrmann & Guenther, 2017). In addition, studies on climate change adaptation are more focused on the agricultural sector, which is directly related to climate change, while relatively few discuss the strategic behavior of companies, especially small industries, in adapting to climate change (Gasbarro et al., 2017; Herrmann & Guenther, 2017; Kalele et al., 2021). Furthermore, (Herrmann & Guenther, 2017) explained that many studies and publications have focused on organizational climate change adaptation, such as in the insurance, tourism, construction, and water
supply sectors. The basic assumption of these studies and publications is that companies in various sectors are affected by the impacts of climate change, and therefore, companies need to adapt to these impacts. By recognizing climate change, companies can interpret the opportunities and threats posed to gain competitiveness by entering new markets and developing new products or services.

The weaving industry is one of the categories of industry in the Indonesia (BPS, 2020) and is included as one of the sub-sectors in the Indonesian creative industry, which contributes significantly to the Gross Domestic Product (BEKRAF, 2019). The business activity of the traditional weaving (ikat) industry in Kabupaten Sumba Timur is a home-based industry, where most workers are family members, especially mothers and daughters. Although generally, this ikat industry activities is run on a part-time basis and is subsistence in nature, it has become a commercial handicraft business to fulfill consumer needs (Murniati & Takandjandji, 2016; Nugrohowardhani, 2016).

Sumba ikat weaving is a valuable product of the weaving industry, playing an important role in cultural and tourism purposes. Sumba ikat weaving works not only reflect artistic beauty but also contain rich cultural and historical values. The traditional techniques used in making ikat weaving not only represent the high skills of the craftsmen, but are also a symbol of the continuity of cultural heritage preserved from generation to generation. The beauty of the complex motifs and distinctive colors of Sumba ikat fabrics reflects the unique local culture and strong traditions. The use of ikat weaving in traditional ceremonies, rituals and cultural events maintains the authenticity of Sumbanese culture and enriches the experience of tourists interested in the richness of local culture (Anas, 2007; Ningsih, 2019; Welhelmina Ballo et al., 2021). Therefore, as part of the weaving industry, Sumba ikat weaving is not only a valuable artistic product but also plays a role in promoting cultural heritage and attracting tourism in Sumba.

Sumba Island, one of the large islands in East Nusa Tenggara, is a semi-arid climate region consisting of rainy and dry seasons. This island's main characteristic is the lowest rainfall level compared to other islands in Indonesia (Go et al., 2020). Furthermore, (Lassa, Mau, Li, & Frans, 2014) stated that Sumba is a semi-arid area where most of the land is savanna, which has erratic rainfall with low rainfall intensity, which results in a high level of vulnerability in the livestock and food crops sector. In addition to affect in the primary sector, climate change in Sumba also has an impact on the secondary sector, especially the ikat industry sector which uses natural dyes as raw materials. (Murniati &
Takandjandji, 2016) and (Ndamunam, Batubara, & Sundawati, 2019) stated that natural dye-producing plants are increasingly challenging to find, thus requiring efforts to develop and identify dye plants in order to support the sustainability and development of the weaving craft business.

This study aims to describe the innovation strategies of the production process carried out by ikat craftsmen in Kabupaten Sumba Timur. The innovation strategy in the production process is one of the alternative actions in adapting to climate change (Herrmann & Guenther, 2017). The main research question, formulated to answer the problems described above, is what kind of innovation in the production process is carried out by ikat craftsmen in responding to the scarcity of raw materials as a result of climate change and producing valuable products for the tourism industry. This paper is divided into three major parts. First is the introduction that explains the reasons for the importance of this research and a review of the literature related to the research topic. Second is the explanation of the methods used to answer the research questions and objectives. The last part is a discussion of the results and conclusions to provide an in-depth understanding of the adaptation strategies carried out by ikat craftsmen in Sumba.

Climate change adaptation is the process of adjusting to the climate and its current or predicted effects. This adjustment process is carried out by modifying processes, practices, and organizational structures to decrease losses, or to exploit and take advantage of profitable opportunities. Modification of processes, practices, and organizational structures occurs when companies adopt innovations (Aniah et al., 2019).

Beermann, (2011) explains that in dealing with climate change, there are two ways that can be done, mitigation and adaptation, both at the governmental level and at the corporate/organizational level. Mitigation refers to actions to reduce exposure to change through regulation and implementation of technological change, while adaptation refers to adjustments made to respond to current or predicted changes. One of the strategic implementations of mitigating environmental changes from a business management perspective is the development of an energy efficient production process which then gains market benefits. Meanwhile, the incentive obtained by the company when carrying out the adaptation strategy is the development of new products as part of technological innovation which then acquires new markets.

From the perspective of business organizations, climate change can be seen as both a risk and an opportunity. Identifying risks and opportunities is considered as the
first step to designing and implementing strategies related to climate change. Companies can benefit by introducing new products or innovative production processes through identifying and exploiting new market opportunities for environmentally friendly products and services (Gasbarro et al., 2017).

Crick, Eskander, Fankhauser, & Diop (2018) explain that the ability to read and respond to signs of climate change is essential for most entrepreneurs to achieve business success. With a good understanding to environmental changes, companies can reduce costs, minimize disruption, or increase sales. Furthermore, Aniah et al., (2019) emphasized that adaptation actions toward climate change are urgent and necessary in the midst of a situation of complications and uncertainty in order to provide alternative paths to compete and succeed.

Innovation is seen as the company's capacity to introduce new processes, new products, new ideas, use of new technologies, and even new ways of working to improve the effectiveness and performance of the company. Generally, there are two types of innovation carried out by small businesses, product innovation and process innovation. Product innovation is seen in changes in the final product or service provided to customers, while process innovation is a change made by companies in the way they produce a product or service (Gunday et al., 2011; Hsin et al., 2019; Killa, 2017).

2 METHOD

This study uses an exploratory and qualitative research approach. There are two main reasons researchers use a qualitative approach to answer the questions and research objectives that have been formulated above. First, the context of this research can only be approached by qualitative method. Second, it is still uncommon to find quantitative indicators to measure climate change adaptation strategies in terms of production process innovation in ikat industry, so a more in-depth and detailed exploration is needed.

The qualitative data in this study was obtained by semi-structured in-depth interviews with 20 informants of ikat weaving craftsmen in Kambera District in July 2021. The selection of respondents was based on non-probability sampling technique by considering the length of business. The main interview questions were about the respondent's understanding of climate change and its impact on their business, as well as what strategic actions have been taken related to innovation in the production process. The following table summarizes the details of the samples.
Qualitative data analysis was carried out through several stages. First, transcribing the interview data and making key notes for further observations. Second, organizing data and coding that allows researchers to develop key themes to answer the research questions. The last step is the verification step.

### 3 RESULTS AND DISCUSSION

In general, the characteristics of the handicraft business in the ikat industry in Sumba Timur are home-based businesses using traditional and simple weaving tools that have been passed down from generation to generation. Ikat fabric production equipment is adjusted to the needs of use. To explore respondents’ perceptions of climate change and its impact on the ikat business, respondents are aware of climate change and its impact on the availability of raw materials, as stated below:

“…in the past, looking for kombu was easy, available around the house. Today, it is difficult to get, we must go to the hill, walk far just to get it…”(R14)

“…today, for the source of blue color, the wood in the forest is not easy to find, need to go to far away to get….in the past it was available behind the house…”(R17)

“…it is right that to find the leaves for the source of blue colors in the forest is difficult…”(R8)
Efforts taken by craftsmen to adapt to climate change consist of looking for alternative raw materials, modifying raw materials, and cultivating plants as sources of raw materials. Following are some statements regarding alternative efforts to be made when there is a shortage of raw materials.

“...in the past, we used cotton for weaving but it took a long time to make. Now yarn is available in the shop as ready material. We are only looking for natural dyes. During the dry season like this, the tilapia leaves start to stunt and are no longer fertile due to the (lack of) rain, so we usually mix it with the coloring products from the shop so we can work on something that we can sell...”(R13)

“... we still use natural dyes. If it's hard to get around here, we can order from Nggongi. For the blue color which is difficult to get, we give the cloth to (the people in) Mondu, so they can do the dye process...”(R17)

“... we looked for wood for the blue color until we got it (even) if it is far and took long time. Now we are trying to grow our own plants and we already can make use of it...”(R16)

“... we use Wantex (a well-known brand of clothing dyes), so we can produce cloth quickly...”(R10)

“... We used to get Kombu in Mburukulu and Mangili, but now it is rare, there's no rain, so to give black color we use Wantex...”(R2)

The innovation process in modern companies is generally performed by reconfiguration and realignment of the innovation process. Reconfiguration refers to a company's efforts to dynamically adapt and develop its innovations by proactively adapting the innovation process, and reactively transforming the innovation process to respond to environmental changes. Reconfiguration of the innovation process is required as a result of changes in the market and the company's technology. Meanwhile the realignment of innovation process refers to the combination and integration of various activities in order to achieve superior performance (Lichtenthaler, 2016).

Referring to the general characteristics of the business in the ikat industry in Sumba, it can be understood that the innovation process done based on the theories and views explained above is not yet as perfect as it is done in modern business organizations. However, based on the results of the research analysis, it was found that the innovation of the production process in adapting to environmental changes carried out by ikat craftsmen in Kecamatan Kambera, formed at least three orientations of the adaptation strategy for the innovation of the production process as shown in Figure 1.
Adaptation of production process innovation by craftsmen shows three orientation patterns. First, there is a strong tendency to maintain the production process that has been performed for generations by ensuring that the production process is carried out using natural raw materials. The adaptation is achieved by cultivating plants that produce natural dyes to maintain the product's uniqueness. We categorize these adaptive behaviors as culture-oriented adaptations. This first strategic behavior is mostly performed by businesses that are relatively well established with more than 25 years of business. Second, there is also a strong tendency to use alternative raw materials (chemical dyes) to shorten processing time and to quickly earn income from the production process and maintain production continuity to meet market demand. We categorize this behavior as a business-oriented adaptation behavior, which is more likely to be performed by craftsmen with more than 10 years of business. Third, a combination of business-oriented and culture-oriented adaptation strategies. In this category, there are craftsmen who maintain the authenticity of the ikat cloth by giving some of the traditional coloring work to other parties in order to accelerate the processing time to meet supply needs.

Business-oriented and culture-oriented weaving industries are two approaches that significantly influence the production and marketing of the traditional weaving industry. A business-oriented approach emphasizes production efficiency, competitive product development, and strong marketing strategies to achieve market targets and high profitability. On the other hand, a culturally oriented approach places emphasis on preserving cultural heritage, respect for traditions, traditional techniques, and ethical values in every stage of production. The business-oriented weaving industry tends to
prioritize design innovation, the use of modern technology, and adaptation to global market trends, while the culture-oriented weaving industry prioritizes preserving traditional knowledge, passing on natural dyeing techniques, and respecting the cultural values contained in each work. However, both have an essential role in promoting the sustainability of the weaving industry, with business-oriented industries driving economic aspects and industrial competitiveness, while culture-oriented industries maintain the authenticity of local culture and encourage respect for traditional values. The synergy between these two approaches can make a significant contribution to the growth of the weaving industry as a whole.

In the context of Sumba’s rapidly growing tourism, the weaving industry plays a dual role. Its competitive business aspect allows this industry to become a robust economic tourist attraction for the region, attracting tourists with its high-quality products. On the other hand, the emphasis on cultural values in the process of making Sumba ikat weaving adds a rich dimension to local culture, enriching the experience of tourists who are interested in the uniqueness of regional culture. Thus, a weaving industry combining these two orientations not only strengthens the local economy but also supports increased tourism interest in Sumba, making ikat weaving one of the main attractions for visitors attracted by the rich culture and artistic beauty of Sumba.

4 CONCLUSION

Sumba Island, as stated by experts, is categorized as a semi-arid area or a savanna area which is characterized by low rainfall, resulting in a high level of vulnerability. This has an impact on the diversity of the livelihoods of the people to adapt and survive (Nugrohowardhani, 2016). Ikat industry is one part of the survival processes. However, with the increasing value of ikat products, the ikat business has begun to lead to a business orientation to meet market demand. The results of this study provide an illustration that the ikat craftsmen understand the existence of climate change which results in the scarcity of raw materials. To respond to this change, the craftsmen make adaptations in the production process while maintaining the originality of the product by providing raw materials independently and also by making adjustments to the use of alternative raw materials.

The results of this study propose a production process innovation model related to climate change adaptation by ikat craftsmen to capture opportunities for tourism
development by offering products that maintain cultural value while having high economic value. By all means, this model needs to be approached more deeply, either by conducting qualitative or quantitative exploratory studies. Further research is needed by first making indicators that definitely measure the orientation of both cultural orientation and business orientation in the ikat production process in Sumba.
REFERENCES


BPS. (2020). Klasifikasi Baku Lapangan Usaha Indonesia. BPS.


