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# Artificial intelligence and socioeconomic perspective in Indonesia

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#### ABSTRACT

Article History Received 30 November 2023 Accepted 3 December 2023 Published 8 December 2023

**Keywords** affirmative policy; agricultural workforce; artificial intelligence; economic inequality; organizational culture;

JEL Classification J00; K20; O38 Artificial Intelligence (AI) has begun to penetrate various social and economic activities in Indonesia. During the pandemic, social distancing activities were able to accelerate the application of AI, and promptly became a safety valve and economic driver in various sector. However, attention to AI implementation opens up space for intensive discourse. AI as a technological element also has social and economic impacts, especially social, economic and political inequality. In the midst of obtaining positive economic benefits, innovation excellence and efficiency, AI in Indonesia still faces problems with agricultural workforce (38.7 million people), ethical and legal aspects, and organizational culture. Solutions from a social and economic perspective anticipating AI include (i) affirmative policies aimed at empowering and increasing the productivity of agricultural workers, (ii) collaboration between IT experts and business practitioners, social science experts and legal practitioners to ensure AI works within a safety and legality framework; and (iii) building an organizational culture in business and public sector management to run a business that meets sustainability principles.

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#### INTRODUCTION

Artificial Intelligence or AI is one technology that is getting attention nowadays. AI is a computer system capable of performing tasks related to human intelligence, including identification, analysis, and decision making. AI is capable of carrying out learning, reasoning and self-correction processes. AI works by modeling human thought processes, designing and imitating human behavior, and solving human life problems

AI has been widely applied in various social and economic activities. AI is used in various industries to improve efficiency and decision making. Some examples include (i) health services where AI analyzes medical records, and assist with diagnosis and treatment planning (Lopez-Jimenez, 2020; Sunarti et al., 2021); (ii) agriculture, to streamline the need for production factors (Talaviya et al., 2020) and build a food security system (Kutyauripo, Rushambwa & Chiwazi, 2023); (iii) manufacturing where it improves production processes, reduces defects and downtime, and increases overall efficiency (Plathottam et al., 2023); (iv) transportation, for traffic management, safety, public transportation, and urban mobility, and asset productivity improvement (Abduljabbar et al., 2019); (v) education, in personalizing learning experiences, assessing student progress, and customized feedback (Tapalova providing & Zhiyenbayeva, 2022); (vi) e-commerce, where it makes easier for users to find products regarding their

interests (Rust, 2020). There are many examples of AI applications in other fields.

Facts show that the pandemic seems to accelerate AI adoption and MSME growth (Hradecky et al., 2022). During the pandemic, measures to prevent the transmission of COVID-19 infection led the termination of activities in most industries to avoid physical contact between people. At the same time, economic activities must work to drive production and consumption processes, so that automated processes become the mainstay of replacing the role of humans. At the 2022 World Economic Forum, CEOs strengthened their intentions to increase industrial automation. The general view is that AI technology will continue to work in all industries and businesses in line with the level of efficiency achieved through efforts to automate production processes and other business processes.

The presence of AI represents a technological intervention that has a massive impact on social and economic activities and its various implications. Sartori & Theodorou (2022) stated that AI practices force new values or frameworks of thinking that include requirements, design, and development methodologies in solving human problems which are more efficient and fair. AI calls for transparency and explanation, accountability and contestability of how business processes produce sustainable productivity under human control.

The existence of AI also demands certain institutional mechanisms that provide a socially and economically acceptable technological narrative. However, AI is also like a knife that can hurt and reveal traditional issues of social, economic and political inequality. That is why, the presence of AI must produce learning to build a better development vision to reduce social impacts. The practice of AI is very rich with an interdisciplinary approach and is expected to provide benefits from social, economic and technological perspectives.

There are many implications of AI use for socioeconomic activities. First, in developed countries the application of AI will be accelerated by demographic conditions, where most of the population is aging, and the number of the workforce is constant or shrinking (Shin, Jung & Lee, 2022). Thus, AI's position will help smooth the workforce crisis entering retirement periods. On the other hand, in developing countries, where the workforce is still high, AI is considered a challenging issue because it has a serious impact on "killing jobs".

Second, AI will create inequality (Sartori & Theodorou, 2022). Direct unemployment may occur in industries that apply AI technology. The automation process produces efficiency in business processes, as well as achieving product quality assurance and production system sustainability. Industries that implement automation will indirectly find higher added value than industries that have not been automated. This will give rise to economic disparities among community groups, among industries and its derivative implications. Population-dense developing countries will face the impact of AI very seriously, even if job opportunities remain abundant.

Third, the government needs to think about industry priorities and social safety policies to reduce the impact of AI. There are public sectors that really need AI for reasons of efficiency, accuracy and comfort/safety in their business processes. The transportation sector, or public service offices, may be amenable to joining AI as demand for labor shrinks, demands for quality of service and safety. However, in other sectors, where the need for labor is high, affirmative policies for reasons of social safety can be prioritized over efficiency-oriented AI (Nordström, 2022).

What are the opportunities and disadvantages of AI in Indonesia? Specific studies of AI implementation in Indonesia have not been widely published. This article tries to provide an analysis from a socioeconomic perspective regarding the possibilities that will occur and anticipation of issues related to AI in Indonesia.

#### OPPORTUNITIES FOR AI IMPLEMENTATION

The population of Indonesia in 2020 was more than 270 million people, with population growth of 1.25% per year (BPS, 2021). Of this population, as many as 53.6 million (20.5%) Indonesians fall into the middle class group, which according to the World Bank shows daily expenditures between USD7.75-USD38. The middle class is the backbone of the Indonesian economy, which is independently able to innovate and be creative in driving economic activity in all sectors (World Bank, 2019). According to Pratomo, Syafitri & Anindya (2020), the Indonesian middle class has adequate education and skills, entrepreneurial and digital communication abilities and is a driver of economic transformation in the development of urban areas.

From a macroeconomic perspective, Indonesia's economic growth in 2022 was 5.31% (BPS, 2023a). The growth was largely driven by strong domestic consumption with an increase of 4.48% per year. The international trade balance recorded a trade surplus with a 14.93% annual growth in exports. Gross Domestic Product (GDP) at current prices reaches IDR19,588.4 trillion and GDP per capita reaches IDR71.82 million or USD4,788. As a result, according to the World Bank, Indonesia is included in the upper middle income group (USD4,046 to USD12,535).

Indonesia's ICT development has shown positive development in the last five years, with an increase in the ICT Index value from 5.07 (2018) to 5.85 (2022) (BPS, 2023b). The results of the East Ventures study (2023) stated that AI will be one of the keys to the growth of the ICT sector and the Indonesian economy. The IMD World Competitiveness Center report shows Indonesia's Digital Competitive ranking is in 51st position, a significant increase compared to 2018 which was ranked 62nd. Indonesia's ICT development indicates the fastest progress compared to other ASEAN countries (Table 1).

## Tabel 1. Digital Competitive Ranking and Score of Indonesia

Digital Competitive Ranking						
Negara	2018	2019	2020	2021	2022	Score
Singapore	02	02	02	05	04	99.48
Malaysia	27	26	26	27	31	76.42
Thailand	39	40	39	38	40	68.19
Indonesia	62	56	56	53	51	56.74
Philippines	56	55	57	58	56	52.81
Courses TMD V				Cartan	(2022)	

Source: IMD World Competitiveness Center (2023)

Indonesia's digital economy is estimated to reach USD360 billion in 2030 with annual growth of 21% during 2022-2030. Furthermore, the Indonesian market has the highest growth in information technology (IT) spending in Asia Pacific with annual growth of 13% during 2020-2024 to reach USD6 billion (East Ventures, 2023).

The growth of the ICT sector is driven by three main factors (East Ventures, 2023). First, increasing internet consumption. The increase in internet consumption is also accelerated by the increase in internet users from 224 million in 2022 to 269 million in 2028. At the same time, the increasingly widespread use of the Internet of Things (IoT) and

the expansion of the 5G network will encourage internet consumption.

Second, digitalization of MSMEs and startup growth. The government is encouraging the digitalization of MSMEs through several credit and electronic payment (e-payment) programs. Startup business activity with electronic transactions shows a sharp increase in tier-2 and tier-3 cities. Tier-2 cities or rising urbanites include Makassar, Denpasar and Semarang. Meanwhile, tier-3 or slow adapter regions are, for example, Magelang, Prabumulih and Bangli.

Third, vertical sector growth. The growth of the fintech and e-commerce industry is supported by adequate hardware and software. Conventional business actors are starting to adopt technology for operational efficiency. These things increase ICT investment by businesses in all sectors.

The social, macroeconomic and ICT performance shows that Indonesia is a strong emerging economic country. Population potential is a promising source of economic and market growth and has a geopolitical influence on the surrounding region. The number of the middle class far exceeds 50 million people (equivalent to the middle class in Singapore, Malaysia and Thailand), and will continue to rise along with economic progress. This is a driver for the acceleration of economic development and the implementation of automation of business and economic processes. There are optimistic developments that the Indonesian economy will continue to improve in the future, along with the implementation of automation in the production process to serve such large market demand.

## OBSTACLE FACTOR FOR AI IMPLEMENTATION

In general, Indonesia's condition has not yet fully progressed to economic transformation, especially employment. The employment profile in 2022 shows that the agricultural sector still accommodates 28.6% of the workforce (Table 2) which equal to 38.7 million people. Meanwhile, the share of the agricultural economy (to GDP) is only 13.6% (Table 3). Meanwhile, in the manufacturing sector, the share of labor and the economy is 15.3% and 28.9% respectively. From this data, the development pie earnings for the agricultural and manufacturing sectors are equal to 0.48 and 1.89 respectively; or the manufacturing sector enjoys 3.94 times the development pie compared to the agricultural sector. In other words, employment conditions in the agricultural sector (amounting to 38.7 million people) show low productivity and problems related to skills, entrepreneurship, empowerment, participation and subsistence conditions.

Education level	Agricul- ture	Manu- facture	Services	Total
			%	
Never attending school	74.3	7.7	18.0	100
Not completing elementary school	56.8	10.9	32.3	100
Elementary school	43.7	14.2	42.2	100
Junior high school	27.6	18.0	54.4	100
High school	16.5	16.9	66.6	100
Vocational high school	9.4	24.3	66.3	100
Akademi	5.0	10.6	84.4	100
University	3.5	7.2	89.3	100
Total	28.6	15.3	56.1	100
Source: BPS (2023c)				

Table 2. Share of Agricultural, Manufacturing and Services Workers by Education, 2022

urce: BPS (2023c)

Table 3. Economic Share of GDP from Agriculture, Manufacturing and Services

Economic sector	2013	2018	2023
		%	
Agriculture	13.36	12.81	13.57
Manufacture	32.04	27.94	28.92
Services	54.60	59.25	57.51
Total	100.00	100.00	100.00

Source: BPS (2023d)

The implication of this figure is the creation of inequality in various situations (Sartori & Theodorou, 2022). The manufacturing and service sectors will benefit from the flow of development benefits, whereas the agricultural sector receives welfare at a low level. Because the agricultural sector is more dominantly found in rural areas, or areas outside Java, this inequality has an impact on disparities between rural and urban areas, as well as between outside Java and Java. This gap also works to create economic inequality between the middle class and lower income class. When AI adaptation or disparity is related to racial characteristics, it will also create racial disparities (Zhang et al., 2021). This economic inequality creates social and political problems if not managed well, and can hinder the implementation of AI in general.

Solos & Leonard (2022) stated that AI has an impact on low and medium skilled workers. AI will also

have a detrimental impact on their income. The industrial automation process results in worker losses not due to the loss or replacement of jobs, but due to a decrease in the volume of jobs and job income

Table 2 further explains the educational status of agricultural workers. They are generally dominated by workers from the elementary education category, including never attending school, not completing elementary school, graduating from elementary school and graduating from junior high school, respectively at 74.3%, 56.8%, 43.7%, and 27.6%, or the equivalent of 1.46, 9.19, 14.99 and 6.54 million people. The total number of them is 32.19 million people, or around 83% of the total agricultural workforce (38.7 million people).

This situation will complicate the development process in general. This workforce with low education will certainly be a heavy burden for the development of the agricultural sector, and indirectly contrasts with efforts to develop automation in the agricultural sector. The solution to this problem cannot be done instantly, but requires strategy and the suitable target to make them superior and productive human resources.

legal constraints can create Fthical and complications and uncertainties in AI implementation. The implementation of AI in the public sectors has become an intense debate among parties. As a product of technology, AI works like a robot to process and decide things absolutely into efficient or inefficient, black or white, win or lose choices. Whereas, the public sector prioritizes substantive, sensitive and persuasive matters rather than innovation and efficiency. Therefore, the implementation of AI in the public sectors contains many uncertainties. In this case, decision makers in the public sector can adopt strategies from argumentative, temporal, or affirmative approaches to mitigate the indicated uncertainties (Nordström, 2022).

Indonesia, according to Aulia, Nugraha & Parlindungan (2023), has not yet accommodated regulations regarding works of art created by AI, giving rise to uncertainty in term of the protection of works created by AI. Also, banking industry activities still do not guarantee the protection of customer data from possible legal risks (Ayunda & Rusdianto, 2021). In the health services activitiy, it is found that the legal risks resulting from AI malpractice are still unclear and cannot be overcome (Al Ghozali, Destyarini & Anggraini, 2022).

According to Sobrino-García (2021), AI has the potential to cause several problems such as opacity, legal uncertainty, bias, or violation of personal data protection. Existing institutional mechanisms may not be able to manage these risks because they have not been designed to answer or meet the needs of AI implementation. The recommended practice is how to implement AI in the health sector, which collaborates AI design (including the process of selecting data sources, interpretation, validation, and generalization of findings) with final decision making that prioritizes safety and ethics (Lopez-Jimenez, 2020).

Barriers to implementing AI are also faced and are often found at the organizational management level (Hradecky et al., 2022). In general, these obstacles are related to (i) leadership, namely the lack of innovation and leadership commitment to investing in AI; (ii) skills, namely low human resource skills, unfocused resource allocation and no ongoing training program to develop AI; and (iii) organizational culture, namely organizational life that is rigid and lacks respect for innovation, not paying attention to competence and appreciation of innovative human resources.

#### **CONCLUSION AND SUGGESTION**

Policies or programs from a socio-economic perspective can be addressed to overcome AI implementation problems.

The abundant workforce in the agricultural sector (38.7 million people) requires attention to how to increase its productivity. Affirmative policies for the workforce continue to be pursued through improving skills, technical assistance and capital, as well as efforts to empower and increase entrepreneurship so that they can participate more actively in development programs.

Collaboration is an important keyword for AI implementation, by positioning IT developer human resources together with sociological experts, business and manufacturing practitioners, legal and institutional experts to design and find innovation and efficiency, as well as ensuring AI works within a normative, safety, ethical and legal framework.

Implementation of Environmental, Social and Governance (ESG) should be enforced. ESG is a

standard for business enterprises (large or MSMEs) that carry out governance that is transparent, accountable, and meets ethics and legality (East Ventures, 2023). Thus, ESG should become an organizational culture in business and public sector management, at the same time as a design framework for the development of Trustworthy AI (TAI) and contribute to social welfare, economic progress of society, and take into account environmental aspects; thereby ensuring business sustainability (Thiebes, Lins & Sunyaev, 2021).

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# Assessment of visitor perceptions and economic valuation of Tengket Beach attractions

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#### **ARTICLE INFO**

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#### ABSTRACT

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JEL Classification C26; I26; Q51 Tengket Beach has an unspoiled beauty, with stretches of fine white sand as the main visitor attraction. However, the village government and surrounding communities have not been interested in managing this potential. Therefore, this study aimed to determine visitor perceptions, the factors influencing the number of visits, and Tengket Beach tourism's economic value. Samples were determined using the linear time function formula. The data collected were further analyzed by descriptive qualitative, multiple linear regression, and travel cost methods. The results showed that Tengket Beach is perceived as unattractive based on its accessibility and facilities. Based on accessibility indicators, 96.7% of visitors stated that Tengket Beach was not feasible. Meanwhile, based on facility criteria, only 20% of visitors stated that the place had good facilities. Other findings show that most visitors explained that the beach is quite interesting regarding its attractiveness. The results also showed that travel costs negatively affect visits, while accessibility and facilities have a positive effect. Additionally, the economic value of the beach is IDR5,890,560,000 per year. This is an indicator that Tengket Beach has the potential to be used as an economic resource for the surrounding community.

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#### INTRODUCTION

Indonesia is a rich archipelagic country with various natural resources recognized worldwide. The natural attractions comprise islands containing diverse flora and fauna. Moreover, this country has a wealth of history, socio-culture, and customs, making it a tourist attraction. This motivates the government to develop the tourism industry to increase local revenue and community welfare (Bashit et al., 2019).

Tourism has the potential to increase foreign exchange earnings (Kominfo, 2017). In 2019, this sector's foreign exchange reached US\$16.9 billion and contributed 4.3% of Gross Domestic Product (GDP) in 2021. Nowadays, nature and environment-based

tourism contribute to foreign exchange and positively impact conservation.

The tourism sector is one of the efforts to develop local industries and an alternative in promoting economic growth in developing areas (Ayuditya & Khoirudin, 2022). The beach ecosystem provides various human benefits as a source of life for coastal communities and a tourist attraction. Bangkalan is a regency on Madura Island with religious, historical, culinary, and nature tourism potentials. It is strategically located, easy to reach, and has beautiful landscapes and nature, giving it the potential to become a tourist center on Madura Island. One of the areas with the potential for natural beach tourism is Sepulu Sub-district. In 2020, this sub-district recorded 17,403 tourist visits, the fourth-highest number of visits in Bangkalan Regency (Culture and Tourism Office of Bangkalan Regency, 2022).

The tourist attraction in Sepulu Sub-district is Tengket Beach, known for its natural beauty. It has a stretch of fine white sand, clear sea water, and a long coastline lined with trees that complement its natural charm. However, this potential has not been managed properly by the local community. Access to the location and the facilities provided are still inadequate. The surrounding community is also not interested in managing this tourism because they do not know its potential economic value. Subsequently, the absence of good management has decreased the number of visits to Tengket Beach, as shown in Table 1.

Table 1. Number of Visits to Tengket Beach in 2019-2021

Year	Number of Visits	
	people	
2019	20160	
2020	18240	
2021	15600	

Source: Culture and Tourism Office of Bangkalan Regency (2022)

Tourism development requires knowledge of visitor perceptions, influencing factors, and the economic value generated. Visitor perceptions toward tourist attractions have been widely examined by studies such as Panjaitan et al. (2019) at Wediombo Beach, Gunung Kidul. The study found that the indicators include attractiveness, facilities, and beach managers. Furthermore, tourist managers need knowledge of the factors influencing the number of visits. Warningsih et al. (2021), Zulpikar et al. (2017), and Lestari et al. (2020) found that the factors influencing visits to the beach include travel costs, income, age, education, duration of visit, distance, and visitor perceptions.

Tourism site management should be should be encouraged to evaluate the potential economic value. Insight into an economic value is important for developing and wiser use of natural resources. Economic valuation interprets public goods, such as natural resources, which cannot be calculated quantitatively using the willingness to pay (Hasiani et al., 2013).

Valuation theory is widely used to calculate the economic value of tourism. This theory considers the

resources utilized and predicted for the future. According to Dhewanthi et al. (2007), economic valuation refers to assigning a monetary value to all potential resources following the purpose of their utilization. Turmudi et al. (2005) stated that valuation determines the total economic contribution of a particular ecosystem or resource to society. Furthermore, economic valuation provides quantitative market and non-market value to goods and services produced from natural and environmental resources.

The potential of the tourism economy depends on the frequency of visits. This implies that a decrease in visits to Tengket Beach affects the economic value generated. The number of visits could be increased by developing tourism according to the surrounding community's desires. This could influence visitors to return to Tengket Beach. Moreover, an economic assessment is needed to represent the reciprocal relationship between the economy and the environment. The assessment is related to policies and programs for managing natural resources in the future. Therefore, this study aimed to examine visitor perceptions of the factors influencing the number of visits and the economic value of Tengket Beach tourism.

#### **RESEARCH METHOD**

This study was conducted at Tengket Beach, Maneron Hamlet, Senangguh Village, Sepulu Subdistrict, Bangkalan Regency, East Java. The location was determined purposively because the tourism potential of this beach is still not managed properly. This study used primary data on perception regarding attraction, facilities, accessibility, respondent characteristics, travel costs, distance traveled, number of visits, and income. The data were collected through observation, interviews, questionnaires, and documentation.

The population comprised tourists visiting Tengket Beach. In this study, the population size was unknown because the number of visitors was uncertain. Therefore, the number of samples was determined using the linear time function formula. The formula used is as follows (Endang, 1993):

$$n = \frac{T - t0}{t1}$$

$$n = \frac{(4 \text{ days (5 hours x 60 minute)}) - 5 \text{ hours x 60 minute}}{30 \text{ minute}}$$

$$n = \frac{1200 - 300}{30} = 30$$
 people

Where T is the study time in minutes,  $t_0$  is the sampling time,  $t_1$  is the time for filling out the questionnaire, and n is the number of respondents. The study time was every weekend on Saturday and Sunday from noon to evening when the beach was crowded with visitors. The linear time function formula obtained 30 respondents as samples. The study used a non-probability sampling method with an accidental approach. According to (Syahrum & Sali, 2014), accidental sampling is based on coincidence. In this case, the tourists met accidentally were suitable to be used as samples. They comprised tourists that visited Tengket Beach at least twice and are aged 17 and over.

The data collected were analyzed to solve the The problem formulation. study performed quantitative descriptive analysis to determine visitor perceptions of Tengket Beach. The analysis used a 5point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Perceptual assessment indicators include the attractiveness of seawater, sand, and beach cleanliness (iiSetiawan & Suryasih, 2016); accessibility based on directions and road conditions, facilities, including tourism equipment rental, parking, bathrooms, places to eat and worship, and trash cans, and the comfort level (Panjaitan et al., 2019). Comfort is a human assessment towards the sense of security and serenity in carrying out tourism activities (Kaihatu & Hiariey, 2021). The perception assessment results were categorized using the following formula:

$$NN = \frac{Rb}{Sr} x \ 100\%$$

Where NN is the percentage comfort value, Rb is the number of respondents strongly agree and agree, and Sr is the total number of respondents. The comfort scores are > 80% included in the very good category, 60-79% considered good, 40-59% for less good, 20-39% perceived as not good and <20% implying very bad.

The factors influencing the number of visits to Tengket Beach tourism were determined using multiple linear regression analysis. This statistical analysis is used to examine the relationship between the dependent and independent variables (Syahrum & Sali, 2014). Moreover, TCM was used to estimate the number of visits per year. Demand was formed from a multiple linear regression model with the following equation:

 $Y = \beta_0 + \beta_1 X_1 + \beta_2 D_{Pen} + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$ 

Where Y is the number of visits,  $\beta_0$  is a regression constant,  $\beta_{1-4}$  is a variable regression coefficient, and  $X_1$  is travel costs (IDR), including transportation, parking, tickets, consumption, and souvenirs.  $D_{Pen}$  is a monthly income based on the minimum wage of Bangkalan Regency, which is IDR1,956,773.43. Dummy 0 is < minimum wage, and Dummy 1 is  $\geq$  minimum wage,  $X_3$  is the length of time in hours at the tourist location,  $X_4$  is the travel time to reach the tourist location, and  $X_5$  is accessibility regarding directions and road conditions.  $X_6$  is a facility comprising tourist equipment rental, parking, bathrooms, places to eat and worship, and trash cans. Additionally, variables  $X_5$  and  $X_6$  were measured using a Likert scale.

The economic value of Tengket Beach tourism was calculated using TCM, which required a consumer surplus value. The value is known when the relationship between cost and visit frequency is established (Batubara et al., 2020). TCM is an initial approach used by environmental economists to estimate the demand for environmental benefits, by utilizing the time and travel expenditure paid by each tourist when visiting tourist destinations (Bashit et al., 2019). In this method, the first assumption states that travel costs to a natural tourist attraction influence visits to that tourist destination, which are made in a single trip. Meanwhile, the second assumption states that all individuals will respond in the same way to increases or decreases in travel costs and entrance fees to visit the tourist attraction (Bashit et al., 2019). TCM in economic calculations is determined by the amount of expenses incurred by each tourist when visiting a tourist attraction, including transportation costs, consumption during recreation, entrance fees, fees, souvenirs, documentation, parking and equipment rentals (Mandela & Harini, 2021). Consumer surplus per individual per year was calculated using the following formula (Harahap, 2015).

Consumer Surplus = 
$$\int_{p0}^{p1} f(px)dP$$

Where  $P_0$  and  $P_1$  are the lowest and highest travel costs, and f(px) is the demand function of travel costs. The economic value of Tengket Beach was calculated using the formula Economic Value = Consumer Surplus x  $\Sigma$  Visits per year (Sukwika & Kasih, 2020).

#### **RESULT AND DISCUSSION**

#### **Characteristic of Respondent**

Before analyzing visitor perceptions, the factors influencing the number of visits and the economic value of Tengket Beach Tourism need to be understood, starting with the characteristics of visitors to the tourism site. Visitor characteristics can be observed based on age, gender, level of education, occupation, place of origin, and income.

There are nine age categories based on the criteria of the Ministry of Health. In this study, only three criteria were taken, namely late adolescence, early adulthood, and late adulthood. Group determination based on survey results. The age of respondents influences their physical condition and level of productivity when visiting a tourist destination. The needs of each consumer will vary depending on their age (Siga & Siswantara, 2021). Based on the survey results as shown in Table 1, the age group that dominates is the 17-25 age range, accounting for 73.33%. The age group with the fewest respondents falls within the 36-45 age range, which is 3%. This finding is in line with the results of research on Sigandu Beach (Hanifah et al., 2019).

The distribution of male and female respondents visiting Tengket Beach Tourism is equal, with each accounting for 50%. Respondent characteristics based on the highest level of education in Table 1, show that 50% of the respondents visiting Tengket Beach Tourism have completed high school. The majority of respondents, 27%, are students. The remaining respondents have various occupations such as private employees, entrepreneurs, drivers, traders, domestic helpers, and mechanics.

In terms of the place of origin, the majority of respondents (83%) are from Bangkalan or areas near the tourism site. The areas within Bangkalan include Sepulu, Galis, Kokop, Tanjung Bumi, Klampis, and Bancaran. Meanwhile, 17% of respondents are from outside Bangkalan, originating from Sidoarjo, Surabaya, and Lamongan.

Regarding income, this study refers to the minimum wage in Bangkalan, which is Rp 1,956,773.48. According to Table 2, the majority of respondents earn less than Regional Minimum Wage (UMR) in Bangkalan, accounting for 73%. Meanwhile,

23% of respondents have income equal to UMR in Bangkalan, and 4% earn above UMR Bangkalan

Table 2. Characteristic of Respondent

Characteristic Total		Percentage	
			%
Age	17-25 year	22	73.33
	26-35 year	5	16.67
	36-45 year	3	10.00
Gender	Female	15	50.00
	Male	15	50.00
Education	Elementary School	6	20.00
	Junior High School	9	30.00
	Senior High School	15	50.00
Work	Student	8	26.67
	Employee	4	13.33
	Shopkeeper	7	23.33
	Entrepreneur	3	10.00
	Domestic Worker	2	6.67
	Driver	3	10.00
	Trader	2	6.67
	Mechanic	1	3.33
Origin	Areas Outside	5	16.67
	Bangkalan		
	Bangkalan	25	83.33
Income	<umr bangkalan<="" td=""><td>22</td><td>73.33</td></umr>	22	73.33
	UMR Bangkalan	7	23.33
	>UMR Bangkalan	1	3.33

#### **Visitor Perceptions of Tourist Attractions**

Tengket Beach is a natural tourist attraction in Maneron Hamlet, Senangguh Village, Sepuluh Subdistrict. This sloping beach has unspoiled natural beauty, a stretch of fine white sand, and a long coastline lined with trees that complement the natural charm. Also, it is equipped with facilities and infrastructure that could support tourism activities. For instance, photo spots and food stalls provide regional specialties uch as *rujak ontal*, which are often sought after by visitors.

A tourist destination is located in one or more administrative areas with attractions, facilities, accessibility, and community. These elements interrelate and complement each other to create tourism activities (Decxyvano & Akiriningsih, 2022). Assessing visitor perceptions of the Tengket Beach tourist attraction is important for the management. The assessment could be used as a consideration for making development decisions. This study was conducted on 30 respondents to describe tourism perceptions of Tengket Beach, as shown in Table 3. The three components to assess visitor perceptions include attractiveness, accessibility, and facilities.

Visitor perception of Tengket beach was assessed using the criteria of seawater clarity, beach

cleanliness, and white sand. Based on the analysis, 24 respondents perceived that Tengket Beach has clear sea water, while 21 stated that the beach has white sand with fine grains. Furthermore, 20 respondents had a neutral perception of the beach's cleanliness. Based on the comfort score assessment, 60% of visitors perceived that Tengket Beach has good attractiveness, different from surrounding beaches. Two beaches have been developed in the nearest location. First, Tlangoh Beach has white sand, big waves, and a not-too-long coastline. Second, Biru Beach has a rocky beach and big waves, making visitors unable to walk along the coast. The waves are not too big at Tengket Beach, which is long, sloping, and with fine white sand, hence it is more attractive than the two surrounding beaches. This is in line with Keliwar & Nurcahyo (2015), stating that 44.6% of visitors came to the Pampang Cultural Village because of its unique appeal.

Table 3. Visitor Perceptions of Tengket Beach

Tourism Potential			Score			Total
	1	2	3	4	5	
Attractiveness						
Beach water	0	0	6	12	12	30
White sand	0	0	9	15	6	30
Beach cleanliness	0	1	20	4	5	30
Percentage comfort			60%			
Accessibility						<u> </u>
Directions	2	16	10	2	0	30
Road Feasibility	7	20	3	0	0	30
Wide road	0	11	18	0	1	30
Percentage comfort			3.3%			
Facility						<u> </u>
Tour equipment rental	29	1	0	0	0	30
Parking	0	7	18	5	0	30
Food stalls	0	0	2	6	22	30
Toilet	0	8	18	2	2	30
Worship place	9	10	10	1	0	30
Rubbish bin	14	15	1	0	0	30
Percentage comfort			20%			

Based on the accessibility indicators, 28 visitors considered the road to Tengket Beach not feasible, 11 perceived it as narrow, and only 2 stated clear directions. Based on the comfort score, only 3.3% of visitors perceive the beach accessibility as good. It is located along the road to the village, which is only enough for one car to pass. When there is an intersection between two cars, one should reverse

first. Furthermore, the road is sandy soil, not paved, and becomes muddy during the rainy season. This makes many vehicles get stuck in the muddy sand when entering the beach. The results support of Riskawati (2015) that the accessibility in the locations examined is very low, as evidenced by the many damaged asphalt roads with holes and no traffic signs, reducing the number of visits.

Based on facility indicators, Tengket Beach has limited facilities. The assessment showed that 29 of 30 respondents stated the beach lacks trash bin facilities and is scattered with litter. This is in line with the findings that visitors perceived the beach as dirty. Furthermore, all respondents stated there are no rental tourism facilities such as boats, vessels, buoys, and lodging. The beach has toilets and places of worship, but the conditions are still very simple. Only 20% of respondents stated that the facilities on the beach are good. An overview of the beach conditions is depicted in Figure 1. In contrast, Purwanto, Emy Sadjati (2019) stated that visitors perceived the tourist facilities as good because they were well-equipped.

#### **Influencing Factors of the Number of Visits**

The factors influencing tourist visits to Tengket Beach are shown in Table 2. The analysis has fulfilled the classic BLUE assumptions of best linear unbiased estimation required to use multiple linear regression. Table 4 shows the adjusted R2 value of 59.2%. This indicates that 59.2% of the total tourist visits are influenced by all the variables in the model. The remaining 40.8% is influenced by other factors outside the regression model. The Anova test showed that the calculated F value exceeds the F table at a 1% error degree. This shows that the variables of travel costs, income, length of time at the location, travel time, accessibility, and facilities have a simultaneous influence (Jannah & Fauziyah, 2023).

The variables' influence was also partially analyzed to determine each variable's effect on the number of tourist visits to Tengket Beach. The influence is partially seen based on the t-test significance. The multiple linear regression analysis showed that travel costs, accessibility, and facilities influence the number of visits. Meanwhile, travel time, income, and length of time at the location have no influence.



Figure 2. Tengket Beach

Travel costs are important because visitors must pay a certain amount for tourism activities. The results showed that the travel cost variable has a regression coefficient of 0.0000232. A negative coefficient implies an inverse relationship between the travel cost and the number of tourist visits. The negative relationship indicates that higher travel costs incurred by a visitor reduce the number of visits. This is seen by visitors incurring travel expenses of less than IDR45,000 within 15-45 minutes, with a frequency of 3-5 visits per year. Meanwhile, visitors spending more than IDR75,000 with a travel time of 1.5-3 hours only have a frequency of 2 visits per year. Additionally, it was found that lower travel costs reduce the time to reach tourist sites, attracting more visitors. In line with this, Sukwika & Kasih (2020) and Warningsih et al. (2021)

stated that travel costs negatively influence the number of visits.

Accessibility significantly and positively influences the number of visits, as indicated by a regression coefficient of 1.151. This shows that improved access for convenience to tourist sites increases the number of visits. In the field, 10% of visitors are very dissatisfied, while 53.3% are dissatisfied with the accessibility of Tengket Beach. This signifies that accessibility should be considered by the Village Government and the surrounding community that wish to develop tourism potential on the beach. Furthermore, the unconducive road should be a concern of the village and regional governments for tourism development. These results support that accessibility positively influences the number of visits (Ayuditya & Khoirudin, 2022).

Variable	Coefficients	Std. Error	t	Sig.	VIF
(Constant)	3.950	1.264	3.125	0.005	
Travel Cost	-2.32E-05	0	-2.372*	0.026	2.527
Income	0.205	0.318	0.644	0.526	1.086
Length of Time on Location	0.206	0.155	1.328	0.197	1.268
Traveling time	-0.255	0.309	-0.826	0.417	2.668
Accessibility	1.151	0.264	4.364**	0.000	1.131
Facility	-1.279	0.505	-2.531*	0.019	1.172
R <sup>2</sup>	0.676		DW	2.170	
F count	8.012				

Table 4. Factors Influencing the Number of Visits

\* and \*\* denote significant level at 0.05 and 0.01

Facilities significantly and negatively influence the number of tourist visits, as shown by a regression coefficient of -1.279. This result denotes that repairs or additions to facilities reduce the number of visits. This is due to 73% of visitors are under 25 years old, 73% have income below the minimum wage of Bangkalan Regency, 70% are unmarried, and 83% come from around Bangkalan Regency. This illustrates that visitors comprise people that want to travel to inexpensive places because there is no entry ticket at Tengket Beach. Moreover, basic facilities such as bathrooms, prayer rooms, food stalls, photo spots, and swing toys are still simple. Improving the quality and quantity of these facilities would increase the entry fees or costs for using them. This could limit people with the aforementioned visits to characteristics. This condition contradicts with statement Ayuditya & Khoirudin (2022). They stated that when the facilities for tourist attractions are improved, consumers would desire to return to these places.

#### **Economic Value**

The economic value of Tengket Beach was calculated using the travel cost method approach. Travel cost analysis was conducted to determine the amount of consumer surplus value obtained by visitors. The consumer surplus value was generated through an integral calculation, with the upper and lower bounds being the highest and lowest travel costs paid by visitors. The highest and lowest travel costs are IDR125,000 and IDR25,000, respectively. Therefore, calculations using the integral formula obtained a consumer surplus value of 772,000 per tourist per year. This shows that the surplus visitors enjoy due to their ability to pay more than the actual demand. Additionally, the consumer surplus shows the

profit received by visitors for the costs incurred when traveling to Tengket Beach.

Consumer Surplus = 
$$\int_{p_0}^{p_1} f(px)dP$$
  
Consumer Surplus =  $\int_{25,000}^{125,000} (3.950 - 0.00000232X1)$ 

*Consumer Surplus* = 337,600/*individual/year* 

From the consumer surplus, an estimate of the economic value obtained by tourism managers in one year is IDR5.890,560,000

 $\begin{aligned} \textit{Economic Value} &= \textit{Consumer Surplus} \times \textit{\Sigma Visit (in 1 year)} \\ &= 337,600 \times 15,600 \\ &= 5.890,560,000/\textit{year} \end{aligned}$ 

Tengket Beach has the potential to improve the economy of the surrounding community. People could earn income from the tourism sector, such as using land for parking, collecting entrance fees, managing parking funds, and opening stalls selling food or regional specialities. Furthermore, income could be obtained from the cost of selfie photo spots or equipment rental for tourism activities.

Budi Setyawan et al. (2020) showed that fishing tourism in Tanjung Kait generates an economic of IDR3,272,524,846 yearly. Similarly, Warningsih et al. (2021) provided an overview of the economic potential of IDR427,140.43 per individual per visit with the resulting economic value of IDR1,507,554,457.51. The economic value of the two tourist sites is much lower than Tengket Beach. This is because fishing tourism is smaller in scope than beach tourism. However, Zulpikar et al. (2017), Lestari et al. (2020), and Panjaitan et al. (2019) found that Batu Karas, Santolo, and Wediombo beaches have an annual economic value of over 50 billion, far higher than Tengket Beach. This is because the three beaches have been managed massively and intensively. Moreover, they are widely known by tourists and attract most visitors from remote areas and outside Indonesia. This condition increases the consumer surplus value and impacts the economic value.

#### **Research Implication**

Most of the regions in Indonesia are blessed with very beautiful resources. If developed and managed properly, it will contribute to a very large economy (Hakim et al., 2011). One way of developing natural resources that can be done is to make natural resources into tourism destinations (Dwiputra et al., 2019; Titisari et al., 2022).

Tourism development based on local potential can have a significant impact on the regional economy. At this time, the trend of natural tourism visits continues to increase. This is an opportunity for many regions to take advantage of it, and develop nature-based tourism destinations which are located around them. Beach tourist destination is one of the objects of tourist visits that are much glimpsed by tourists. Some of the advantages offered by this beach tourism object are: (i) the tourist location is very wide, (ii) has a natural attraction, and (iii) affordable location entrance fees (Pratiwi et al., 2019).

The development of Tengket Beach tourism located in Bangkalan Regency requires serious planning from the tourism management or the local government. Development planning could be well prepared through visitor assessment. In addition, information on the economic opportunities derived from tourism development is also required (Hakim et al., 2011; Kaihatu & Hiariey, 2021).

The visitor perception of Tengket Beach depicts that visitor only value natural beauty. They have a very bad perception of cleanliness, accessibility, and facilities. The results showed that travel costs and accessibility negatively and positively influenced visits, respectively. Other findings showed a large potential for economic value through serious management.

The village and local governments should collaborate to plan for Tengket Beach development. The local government could prioritize the development of proper road access to tourist sites. Moreover, the village government could strengthen accessibility by providing transportation facilities that empower local communities, directions, evacuation codes, assembly points, and warning boards. It is also necessary to clean the beach and improve public facilities such as toilets, prayer rooms, and tourist rental equipment (Decxyvano & Akiriningsih, 2022)

Policymakers could use the potential economic value to determine strategic management steps. However, most people are still reluctant to develop beach tourism because they believe visitors often misuse tourist spots to commit non-religious acts. In this case, the Madurese people who adhere to religious values could develop halal tourism in some places. Village and local governments could also conduct comparative studies on halal tourism management. Furthermore, the economic value of Tengket Beach could be increased when the consumer surplus is bigger. This could be accomplished when many visitors come from outside, which requires promotion through various social media. In this regard, the Bangkalan Regency Tourism Office should intensify its social media to attract tourist visits.

#### **CONCLUSION AND SUGGESTION**

Based on the results of this study, it can be concluded that most visitors (60 percent) perceive the attractiveness of Tengket Beach as good. However, accessibility and facilities are largerly considered poor. More than 80% of visitors assess that accessibility and facilities at Tengket Beach are very poor. Travel costs and facilities have a negative influence on the number of visits, but on the contrary for accessibility and the annual economic value of Tengket Beach tourism which is worth IDR5,890,560,000. This economic value illustrates that the existence of Tengket Beach has great potential as as a booster of the community's economy.

The study provided the following suggestions or recommendations as follows: (i) improving road access to Tengket Beach, especially at its entrance, (ii) increasing the attractiveness by maintaining the cleanliness of the beach by providing many accessible places, especially where visitors gather, (iii) creating an appeal board for visitors to dispose of garbage in the space provided, (iv) encourage local and village governments to conduct comparative studies of tourism management in accordance with the values of Madurese society.

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# The Influence of economic growth, exchange rate, and inflation on foreign tourist visits to Indonesia

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#### **ARTICLE INFO**

#### ABSTRACT

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Tourism is one of the economic sectors that can quickly bring in foreign exchange for the country if managed properly and sustainably. Many economic variable factors influence the demand and supply of the tourism industry, especially the level of foreign tourist visits, such as economic growth, exchange rate, and inflation. This study aimed to determine the influence of economic variable factors, especially economic growth, exchange rate, and inflation, on the number of foreign tourist visits in Indonesia. A quantitative descriptive method is used in this study. To analyze the factors influencing the number of foreign tourist visits in Indonesia, independent variables such as economic growth, exchange rate, and inflation are used in the Multiple Linear Regression equation model. The data used in this study is secondary data on annual time series for the period 2001 -2020. The research result shows that the number of foreign tourist visits in Indonesia is significantly influenced by economic growth and the exchange rate, while inflation has no significant effect. There are still other factors (noneconomic) that influence the decision of tourists to visit. Several factors that need to be considered to increase the interest of foreign tourists visits in Indonesia are tourist attractions, accessibility, amenities, ancillary, attractive promotions, and social, political, and security stability.

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#### INTRODUCTION

The role of tourism in the economic sector is considered important, both as a foreign exchange earner and for other economic opportunities (Wicaksono, 2022). Tourism is one of the economic factors that can quickly bring in foreign exchange for the country if managed properly and sustainably. In 2022, the tourism sector contributed 3.6% of GDP, which has increased compared to 2021 which amounted to 2.4% (BPS, 2023a). Optimally developing and utilizing tourism can increase economic growth.Therefore, proper management is needed to develop Indonesia's tourism sector (Rohman, 2019). As a country ranked number 4 with the largest population in the world, Indonesia's economy has significant potential with excellent prospects going forward. One of these sectors is the tourism industry, which plays a vital role in creative economic development (Faidzin, 2017). International tourism is a global economic activity utilized by numerous countries worldwide to enhance their contributions to domestic economic growth (Patera, 2015). In the competition to increase the promotion and attractiveness of its tourist destinations, every country around the world has adjusted the standard needs of international tourism. For this reason, Indonesia should focus on developing tourist destinations that align with the requirements of the foreign tourism standard. With the development of Indonesia's tourism industry according to international standards, it will become an attraction for foreign tourist visits.

As shown in Table 1, the number of foreign tourist visits to Indonesia over the past ten years has tended to increase before the COVID-19 pandemic hit the world. Foreign tourist visits to Indonesia peaked at 16.1 million in 2019 but saw a sharp decline of 74.8% in 2020 to 4.05 million, and further decreased to 1.55 million in 2021 due to the abnormal conditions caused by the COVID-19 pandemic. The tourism sector was severely affected as countries implemented restrictions on community activities. However, in 2022, after the relaxation of these restrictions, foreign tourist visits surged by 251.2% (5.47 million) from the previous year's (1.55 million).

Table 1. Number of Foreign Tourist Visits to Indonesia, 2013-2022

Year	Foreign Tourist	Change
	people	%
2013	8,802,129	
2014	9,435,411	7.2
2015	10,406,759	10.3
2016	11,519,275	10.7
2017	14,039,799	21.9
2018	15,810,305	12.6
2019	16,106,954	1.9
2020	4,052,923	-74.8
2021	1,557,530	-61.6
2022	5,470,000	251.2

Source: BPS (2023a)

As can be seen from the table, the level of foreign tourist visits to Indonesia has an increasing trend under normal conditions from 2013 to 2019. Many factors influence the level of foreign tourist visits to Indonesia, such as economic, social, cultural, educational, religious, and other factors. Several factors that influence tourist's decisions to visit are social, personal, and psychological cultural, characteristics of tourists. Furthermore, the trend that improved the number of foreign tourist visits to Indonesia before 2020 was due to the Indonesian government's incessant efforts to build various supporting infrastructures for the tourism industry and carry out tourism promotion through various conventional and digital promotional media. Tourism,

financial development, and economic growth are cointegrated in the long term. Therefore, countries should promote tourism policies that are beneficial to boost economic growth, and in turn, economic growth will positively contribute to international tourism (Rasool et al., 2021).

Table 2.	Economic Growth,	Exchange	Rate and
	Inflation of Indone	esia, 2013-	2022

Year	Economic	Exchange	Inflation
	Growth	Rate	
	%	IDR/USD	%
2013	5.56	12,189	6.97
2014	5.01	12,440	6.42
2015	4.88	13,795	6.38
2016	5.03	13,436	3.53
2017	5.07	13,548	3.81
2018	5.17	14,481	3.20
2019	5.02	13,901	3.03
2020	-2.07	14,105	2.04
2021	3.70	14,269	1.87
2022	5.31	15,731	5.51

Source: BPS (2023b)

Economic variable factors that influence the demand and supply of the tourism industry include income, economic growth, exchange rates, inflation, prices, tax rates, and subsidies. Table 2 shows the development of economic growth, inflation, and exchange rates over the last ten years, where the average economic growth in Indonesia was around 5% before the COVID-19 pandemic. With positive economic growth, it is shown that the country's economic activities are running well, and the infrastructure supporting economic activities is well-provided.

Internationally, inflation categorizes a country's economic condition (Margareni, 2016). In addition, high inflation will hinder economic development because costs continue to rise. The inflation rate in Indonesia for the last ten years has also been wellmaintained at an average of 4.2%, so the price level of goods and services in society is well maintained. Economic development is hindered when cost increases continuously at a high inflation level (Padmayoni, 2020). When inflation occurs, the price of goods and services will increase, reducing consumer's purchasing power, including consumers in the tourism sector. Due to the reduction in purchasing power, tourism economic activities are hindered. Inflation factors have been proven to harm the number of foreign tourist visits; therefore, the government must effectively control national inflation (Sulasmiyati, 2019).

Regarding international trade activities such as international tourism, currency exchange will occur between countries to carry out financial transactions. The inflow of tourists into a country will lead to the growth of foreign exchange reserves, increasing the availability (supply) of foreign currency.

During the last ten years, the Indonesia Rupiah (IDR) exchange rate against the United States Dollar (USD) has shown a tendency to depreciate. In 2013, the exchange rate was IDR12,189 per USD. Itcontinued to weaken until 2022 to IDR15,731 per USD. The weakening of the Rupiah exchange rate was due to various factors such as the US economic recovery, the Fed's interest rate increase, political dynamics, inflation, and the impact of climate change. For the export sector and Indonesia's international tourism, weakening the Rupiah against the USD is very beneficial because the price of Indonesian domestic goods and services becomes cheaper to compete with products and services from other countries. In contrast, the strengthening of the Rupiah against the USD will be beneficial for importers. To minimize the impact of the strengthening and weakening of the currency exchange rate on various economic sectors, various mitigation measures from the Government and Bank Indonesia are crucial.

Tables 1 and 2 show that when the number of foreign tourist visits reached the highest number of 16,106,954 people in 2019, the economic growth rate was only 5.02%. Meanwhile, when foreign tourists visited 8,802,129 people in 2013, economic growth reached 5.56%. The comparison shows that there is a two-way relationship between the two variables. According to (Faidzin, 2017), the causality test show a two-way causality between economic growth and tourism foreign exchange earnings. Thus, it is assumed that the economic growth can function as the dependent and independent variable on foreign tourist visits and vice versa.

Any changes in the values of these variables will affect the demand and supply of the tourism industry, one of which is the level of foreign tourist visits to Indonesia. Padmayoni (2020) conducted research on the effect of the number of foreign tourists, the money supply, and inflation on the exchange rate. Wicaksono (2022) conducted research on the effect of inflation, interest rates, and exchange rates on the development of Indonesian tourism. This study aimed to determine the influence of economic variable factors, especially economic growth, exchange rates, and inflation, on the number of foreign tourists visiting Indonesia.

#### **RESEARCH METHOD**

The data used in this study is secondary data on annual time series for the period 2001 – 2020. Secondary data was obtained from the Ministry of Tourism and Creative Industries, the Statistics Bureau of Indonesia (BPS), the Ministry of Finance, Bank Indonesia, and various other related agencies or associations.

In this study, a quantitative descriptive method is used. A Multiple Regression equation model with independent variables such as economic growth, exchange rate, and inflation is used to analyze the factors influencing the number of foreign tourist visits to Indonesia. The results of this multiple regression equation are used to predict the number of foreign tourist visits to Indonesia for the coming years. The Multiple Regression equation models developed in this study refer to the research results of (Astawa, 2015), (Jananto, 2018), and (Sufi & Sabri, 2020) with some necessary adjustments, formulated as follows:

$$Y = 0 + \beta 1 X 1 + \beta 2 X 2 + \beta 3 X 3 + \epsilon$$

This regression model is designed to help us understand and predict the number of foreign tourist visits (Y) by considering various influencing factors. The key components of this model include the following: The constant ( $\beta$ 0) serves as the initial point or starting value in this equation. The regression coefficients ( $\beta$ 1,  $\beta$ 2,  $\beta$ 3) are numerical values that measure how much each independent variable (X1, X2, X3) affects the number of foreign tourist visits. Furthermore, there is an error term ( $\epsilon$ ) that accommodates the variation in our predictions. In this context, Y represents the total number of foreign tourist visits, X1 represents economic growth, X2 signifies the exchange rate (IDR/USD), and X3 encapsulates the inflation rate. By grasping the interactions between these variables, we can make forecasts and better understand the impact of economic growth, exchange rates, and inflation on the influx of foreign tourist visits to Indonesia.

Theoretically, a significant influence is expected between economic growth, exchange rates, and inflationon the number of foreign tourist visits to Indonesia. The statistical hypotheses for this test are t, F, multicollinearity, autocorrelation, and heteroscedasticity.

#### **RESULT AND DISCUSSION**

#### **Overview of the Research Object**

Every country in the world expects an increase in the number of foreign tourists entering their country. Increasing the number of foreign tourists is one of the fastest ways to increase the amount of the country's foreign exchange reserves from the tourism sector. The increasing of foreign tourists visiting a country shows that a country's economic condition is good. Likewise, well-developed economic conditions indicate a correlation with a country'scrime that provides foreign tourists safety to carry out various activities to fill their vacation time. Positive economic growth shows that the economy is moving and creating jobs, there by reducing the crime rate and impacting the social life of a safe and orderly society.

Economic variable factors influenced the number of foreign tourist visits to Indonesia: economic growth, exchange rate, and inflation. In this study, the factors that influence the number of foreign tourist visits were identified by processing data with a length of 20 years from 2001 to 2020 using a multiple linear regression equation. Table 3 shows the regression results for the dependent variable Number of Foreign Tourist Visits.

The t-test results show that the calculated t-value of the independent variable economic growth is 2.813, which has a value greater than t table (1.746). The pvalue=0.013 is smaller than a=0.05, indicatinga significant correlation between economic growth and the number of foreign tourist visits if the exchange rate and inflation are constant. The calculated t value of the independent variable exchange rate is |-2.314| greater than t table |-1.746| and the p-value=0.034, which is less than a=0.05, indicating that there is a significant relationship between the exchange rate and the number of foreign tourist visits if economic growth and inflation are kept constant. The calculated t value of the independent variable inflation is |-1.887| greater than t table |-1.746| and the p-value=0.077 greater than a=0.05, indicating that there is no significant relationship between inflation and the number of foreign tourist visits if economic growth and the exchange rate are kept constant (Wicaksono, 2022; Singagerda, 2013; Medyawati & Yunanto, 2022). On the one hand, foreign tourists may have a particular interest in tourist destinations in a country that is not affected by inflation in that country. On the other hand, tourists visit the tourist destinations in a country to gain experience and enjoy its unique culture. In addition, the cleanliness of tourist destinations and the friendliness of tourism workers also affect the number of tourist visits (Wiraguna, 2019).

The calculated F value of 7.140, greater than the F table (3.240) and p-value=0.003, indicates a significant influence between economic growth, exchange rates, and inflation on the number of foreign tourists.

Based on the regression analysis results, an R2 of 57.2% and an Adjusted R2 of 49.2% indicate that 57.2% of the variation in the dependent variable (number of foreign tourists) can be explained by variations in the independent variables (economic growth, exchange rate, and inflation). At the same time, the other 42.8% can be explained by other variables outside the model. Other factors (non-economic) that influence tourists' decisions to visit are influenced by cultural, social, personal, and psychological factors of tourists.

The Durbin Watson (DW) value was 1.133 based on the regression analysis results. Meanwhile, from the DW table with a significance of 0.05 and the number of data n=20 and k=3, the dU value is 1.676, and the dL is 0.997. Because the DW value is greater than dL and lies between dU and (4-dU), it can be concluded that there is no autocorrelation.

The Variance Inflation Factor (VIF) values of the three variables, namely economic growth (1.174), exchange rates (1.686), and inflation (1.543), which are smaller than 5, indicating there is no multicollinearity between the independent variables.

The heteroscedasticity test is used to examine the regression model. Inequality of variance from the residuals was observed by looking at the Scatterplot pattern. Based on the output of the Scatterplots, it can be seen that the data points are spread above and below or around the number of 0. The dots do not gather only above or below, and the spread of the data points does not form a wavy pattern. It widened, then narrowed, and widened again, and the spread of dots is non-patterned. The result shows no symptoms of heteroscedasticity in the regression equation.

Variable	Coefficient	t	Sig.	VIF
Constant	9.4	4.707	0.000	
Economic Growth (%)	1.055	2.813	0.013	1.174
Exchange Rate (IDR/USD)	-0.0000449	-2.314	0.034	1.686
Inflation (%)	-0.456	-1.887	0.077	1.543

Table 3. Factors Affecting Number of Foreign Tourist Visits

t-table (level of significance 10%, dk 16)=1.746; F calculated=7.140; F table (level of significance 5% n1=3 dan n2= 16)=3.24 at significant level 0.003;  $R^2$ =57.2%; Adjusted  $R^2$ =49.2%; Durbin Watson=1.130

Furthermore, the results of the research table show that economic growth has a positive and significant effect on the number of foreign tourist visits to Indonesia. The regression results show that Indonesia's economic growth in 2001-2020 has a positive sign  $\beta$  (1.055) and has a significant effect (0.013<0.05) on the number of foreign tourist visits to Indonesia in 2001-2020. The regression equation for the number of foreign tourist visits formed shows that every change in economic growth by 1% will increase the number of foreign tourists by 1.055 million (cateris paribus). The increase in economic growth shows to the world community that Indonesia's economic condition is good and infrastructure development is going well to facilitate the movement of economic activity. For the tourism industry, this means expediting the development of the tourism industry with the growth of new places as tourist destinations that will attract a lot of interest from both foreign and domestic tourists to visit. Investing in the three components of tourism infrastructure, namely transportation and communication infrastructure, accommodation, and culinary, and recreational facilities, strongly and positively impacts the appeal to international visitors (Nguyen, 2021).

The results of the research table show that the exchange rate (IDR/USD) has a negative and significant effect on the number of foreign tourist visits to Indonesia. The regression results show that the Indonesian exchange rate (IDR/USD) in 2001 - 2020 has a negative sign  $\beta$  (-0.0000449) and has a significant effect (0.034<0.05) on the number of foreign tourist visits to Indonesia in 2001 - 2020, in line with the results of research by (Wicaksono, 2022). The regression equation for the number of foreign tourist visits shows that every depreciation of the exchange rate of 1 IDR/USD will increase the number of foreign tourists by 44 people (cateris paribus). For Indonesia's international tourism sector, weakening the IDR against the USD is beneficial because the price of Indonesian domestic goods and services becomes cheaper to compete with products and services from other countries. For foreign tourists, the low prices of products and services in a country are the main attraction where, with a certain amount of money, they can get more goods and services compared to their country. Foreign tourists with USD currency where the IDR is weakening will gain advantages over the previous exchange rate. Foreign tourists can use this advantage to extend the period of their trip or increase the purchase of goods. The depreciation of the Indonesian currency significantly contributes to improving economic growth (Azizurrohman et al., 2021).

The results of the research table show that inflation has a negative and insignificant effect on the number of foreign tourist visits to Indonesia. The regression results show that Indonesian inflation in 2001-2020 has a negative sign  $\beta$  (-0.456) and has no significant effect (0.077>0.05) on the number of foreign tourist visits to Indonesia in 2001 – 2020. The results of this study are in line with the results of the research (Wicaksono, 2022). The regression equation for the number of foreign tourist visits shows that an increase in inflation of 1% will reduce the number of foreign tourist visits by 456,000. Inflation will cause an increase in the prices of goods and services, so for foreign tourists, this will increase the cost of travel. As a result, they postpone plans to travel to countries facing high inflation. With the increasing travel costs and tourism services and the decreasing purchasing power of consumers, tourists worldwide are certainly considering the risks caused by high inflation and adjusting their plans (Statista Research Department, 2023).

For the Government, the multiple regression equation model shows that the number of tourist visits remains positive and continues to increase. Hence, the Government must increase economic growth and continue to build and develop various infrastructures that can support the development of the tourism industry. Well-maintained economic growth in a sustainable manner cancreate prosperity and reduce inequality (Fairuuz et al., 2022). The Government also needs to maintain stability of inflation and the exchange rate of the Rupiah against the USD so that it does not affect other economic sectors.

In addition to the economic factors mentioned above, which only affect 57.2% of the number of foreign tourist visits, there are 42.8% other noneconomy factors that must also be considered to attract foreign tourists to Indonesia. Factors that need to be considered to increase interest in visiting foreign tourists are tourist attractions, accessibility, amenities, ancillary, attractive promotions, and social, political, and security stability (Sujai, 2016).

Attraction is asignificant factor inattracting tourists to visit. There are three attractions capital to attract visiting tourists, namely, (i) natural resources, (ii) cultural tourism attractions, and (iii) artificial tourism attractions. The existence of attractions is the reason and motivation for tourists to visit (DTW) (Way, 2016). With the advantages of natural scenery that Indonesia has, from the highlands in the form of hills and mountains, to the lowlands and coasts. touristattractions that can be developed are a combination of eco-tourism, educational tourism (edutourism), and sports tourism.

Accessibility refers to facilities and infrastructures that make it easier to visit tourist destinations. These facilities and infrastructure make it easy for tourists to move from one area to another. Accessibility in the form of integrated public transportation infrastructure (airports, ports, bus terminals, train stations) must be prepared to a compelling and affordable cost for tourists to go to several destinations. Increasing the quantity and quality of land roads equipped with traffic signs and directions also needs to be done.

Amenities are all supporting facilities in tourist destinations to meet tourist's needs while on vacation. The facilities and infrastructure needed include hotels or inns, restaurants, theaters, health clinics, parking lots, ATMs, public toilets, rest areas, souvenir shops, and places to do various activities such as entertainment, sports, telecommunications, worship, and other supporting facilities. These amenity factors must be well prepared and kept clean to provide comfort and improve the tourist experience while on vacation.

Ancillary are supporting services that the Regional Government must provide ina tourist destination, both for tourists and tourism actors (Permadi, 2021).

Ancillaries are also things that support tourism, such as management institutions or organizations, tourist information, travel agents, and stakeholders who play a role in the tourism sector (Ardiansyah & Maulida, 2020; Khotimah, 2017; Way, 2016).

Promotion is informing the product or service to be offered to potential consumers/tourists who are included as the target market (Wolah, 2016). The 7P Marketing Mix Strategy (Product, Place, Price, Promotion, People, Process, and Physical Evidence) can be carried out by stakeholders to promote tourist destinations. The marketing mix, which consists of 7 dimensions: product, price, promotion, location, people, process, and physical evidence, partially influences the decision to visit (Santoso, 2020). For tourist destinations to be known and visited by tourists, effective promotional activities to attract tourists are necessary to be carried out. Various promotional media can be used, both conventionally and digitally, which have their respective advantages and disadvantages. Because to attract foreign tourists, the promotional media used must be able to reach the international community.

Social, political, and security conditions are someof the considerations for foreign tourists to travel to a country. If the socio-political conditions of a tourist destination country have a stable tendency, it will bring in more foreign tourists; for example, if crime rates in a country tend to be low, foreign tourists will feel safe in the destination country. In contrast, foreign tourists will avoid visiting a country with a high crime rate (Idealis, 2021). If law enforcement in a country is high, tourists will increase their trust in tourist destinations. However, if law enforcement in a tourist destination is low, the level of trust of foreign tourists in tourist destinations will be low. Abraham & Poria (2020) revealed that a country's political conditions influence tourist's behavior in considering their visit. Athari et al. (2021) proves that political security factors have a significant impact on the tourism sector.

#### **Research Implication**

The present research results showed that economic factors, especially economic growth and exchange rates, significantly affect the number of foreign tourists visiting Indonesia. Conversely, inflation does not significantly affect them. Together, these three economic variables significantly influence foreign tourist visits to Indonesia. These findings will certainly provide some implications for the Indonesian tourism industry.

The significant effect of economic growth and exchange rates on the number of foreign tourist arrivals to Indonesia shows that if economic growth increases positively and exchange rate stability is well maintained, it will positively impact the tourism industry. Therefore, it can be used as a reference for the government and interested parties to make positive policies to keep economic activities running well so that economic growth is maintained positively, and the stability of the Rupiah exchange rate is maintained against the USD so as not to interfere with other economic sectors. Maintaining positive economic growth can be done by continuing to build and develop various tourism infrastructure such as attraction, amenity, and accessibility infrastructure that can support the development of the tourism industry. The tourism industry is an industry that provides experiences for tourists who like to find new experiences to enjoy. Various infrastructures will undoubtedly increase tourism economic transaction activities through tourist visits to various tourist destinations in Indonesia.

The insignificant effect of inflation on the number of tourism visits indicates an influence of noneconomic factors that affect the level of foreign tourist visits to Indonesia such as tourist attractions, accessibility, amenities, ancillary (additional services), attractive promotions, and social stability, politics, and security. In line with the results of (Wahim et al., 2023), attractiveness, promotion, and accessibility positively influence tourist visiting intentions. The diversity of attractions, availability of amenity facilities, ease and integration of accessibility, and additional service facilities for tourists will certainly provide a good image or impression of Indonesian tourism. A tourist destination's positive image significantly influences tourist visiting intentions (Khairun et al., 2022). Attractive promotion through suitable promotional media is necessary to increase foreign tourism visits to Indonesia. Social, political, and security stability is certainly needed to maintain a sense of security for foreign tourists while traveling in Indonesia. If there is social and political turmoil, it will certainly impact the country's security conditions, affecting tourist's visit decisions. In addition, the emergence of Digital Platforms for tourism also affects international tourist visits to a country (Lopez-Cordova, 2020). Digital Platforms have a negative influence; in other words, they will reduce the level of visits to destination countries where these international tourists only need to look through the internet in their homes to see tourist attractions in other countries. The above matter will certainly be a challenge for the government and tourism businesses to think creatively to create tourist attractions that provide experiences to tourists that can only be enjoyed in tourist destinations.

Previous research shows a significant influence between inflation rates, exchange rates, economic growth, and average wages on poverty (Supriyadi, 2017). In this study, the economic variables used are economic growth, exchange rates, and inflation to see their effect on foreign tourist arrivals to Indonesia. The results of this study indicate that together these three economic variables (economic growth, exchange rates, and inflation) have a significant effect on foreign tourist arrivals to Indonesia. These results imply that to maintain the growth of foreign tourist arrivals to Indonesia, the Government needs to maintain the stability of economic growth and the Rupiah exchange rate and inflation rate by maintaining the conduciveness of business activities in the tourism sector so that the impression of Indonesia's tourism world remains positive. Maintaining conduciveness or stability in doing business in the tourism sector can be done by facilitating business licensing, maintaining security and public order, providing supporting infrastructure (attractions, amenities, and accessibility), providing additional services for tourists such as integrated information systems for tourists, and maintaining social, economic and political stability. Given the COVID-19 Pandemic period where restrictions on community activities have resulted in a decrease in the achievement of poverty alleviation (Pham & Nugroho, 2022) which of course can increase security disturbances, the Government needs to make mitigation policies for the world of tourism to keep it running well.

The tourism industry is vulnerable to instability in a country's social, political, security, and economic conditions. The tourism industry experienced by the tourism industry during the 1998 riots and the 2002 Bali bombing incident when various countries issued Travel Warnings to visit Indonesia which had an impact on the dramatic decline in the number of foreign tourist visits to Indonesia. For this reason, the Government needs to synergize political, social, legal, security affairs, economic, and tourism institutions/agencies to coordinate with each other in making mitigation policies against security, social, political, and economic disturbances that impact tourism industry activities. It takes the alertness of the State Intelligence Agency to detect and prevent early activities that disrupt the political, social, security, and economic stability of the country.

#### CONCLUSION AND SUGGESTION

Both economic and non-economic factors influence the level of foreign tourist visits to Indonesia. Based on the results of this study, the economic factors that significantly affect the level of foreign tourist arrivals to Indonesia are economic growth and the exchange rate. In contrast, the inflation rate has no significant effect. Foreign tourists may have a particular interest in tourist destinations in a country that is not affected by inflation in that country. Tourists visit tourist destinations in a country to gain experience and enjoy its unique culture. With the multiple linear regression equation coefficients, each variable is 1.055 for economic growth, -0.0000449 for the exchange rate, and -0.456 for the inflation rate. There are still other factors (non-economic) that influence the decision of tourists to visit. Several factors that need to be considered to increase the interest of foreign tourists visiting Indonesia are tourist attractions, accessibility, amenities, ancillary, attractive promotions, and social, political, and security stability.

As a result, the recommendation for developing the tourism industry in Indonesia is essential to make monetary and fiscal policies that support the development of the tourism industry, such as creating stable and positive economic growth and continuing the development of infrastructure that supports the tourism industry. The Government also needs to maintain the stability of inflation and the exchange rate so that it does not affect other economic sectors. Furthermore, the Government needs to enhance the promotion of Indonesian tourist attractions both directly and indirectly through various activities, improve the quality of service provided by tourism workers, enhance accessibility to these attractions, maintain cleanliness in tourist destinations, provide essential amenities, offer attractive promotions, and ensure social, political, and security stability to foster a thriving tourism industry.

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## Financial literacy on MSME export import decisions and the affecting individual and social factors

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#### **ARTICLE INFO**

#### ABSTRACT

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This study aims to analyze financial literacy affecting export and import decisions, and to analyze what individual and social factors affecting the said financial literacy. The design of this research was clausal associative, with quantitative approach. The sample of this research was MSME actors in Central Java province who were successful or oriented towards carrying out export and import The data collection techniques were questionnaires and activities. documentation. This study used structural equation modeling with Lisrel 8.80 software. The data were analyzed with Confirmatory Factor Analysis. The results showed that there was a significant effect between individual ability on financial literacy and financial literacy on export and import decisions, while between social variables and financial literacy, there was not a significant effect. MSMEs had cooperative characteristics in running their business to complement each other's limitations and gain specific competitive advantages to compete in the global environment, especially export and import activities, so that they could contribute to the national economy. Suggestions for further research, the government should act as an aggregator or facilitator for sharing knowledge regarding financial literacy between MSMEs, MSMEs and academics, MSMEs and related communities, and MSMEs and national private parties.

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#### INTRODUCTION

One of the indicators of a growing business is its expansion to foreign countries or international markets (Oura et al., 2016). Indonesia's export and import activities show a fairly dynamic figure. This proves that international trade activities continue and will always be carried out. Siddiqui (2016) added that foreign trade is beneficial for the welfare of the community. The beneficiaries from import activities are producers, namely workers and entrepreneurs with middle income. On the other hand, the contribution of micro, small and medium enterprises (MSMEs) in boosting the economy cannot be underestimated. Statistics Indonesia states that in accumulation, 61.41% of MSMEs contribute to Gross Domestic Product (GDP). According to Keynes in Case & Fair (2007), GDP (Y) can be obtained because of consumption expenditure (C), investment expenditure (I), government spending (G), and export and import (X-M). Thus, the existence of international trade is very important and strategic because it has a positive effect on GDP formation.

MSMEs dominate the absorption of nearly 97% of the total national workforce. In addition, MSME is a

sector that has minimal dependence on imported components because they use locally obtained raw materials. MSMEs take part in increasing exports, with a volume reaching 14.06% of total exports. This has an impact on reducing the value of the country's foreign exchange balance. Thus, the need for the MSME sector to be independent is very big.

In general, MSMEs often experience delays in their development. This is due to various conventional problems that have not been resolved completely (closed loop problems), such as problems with human resource capacity, ownership, financing, marketing and many others related to business management, so that MSMEs find it difficult to compete with large companies (Harvie, 2019; Karman et al., 2022). Based on research conducted by Djuwita & Yusuf (2018), MSMEs in the creative industry tend to have a shortterm orientation in decision making in their business. This can be seen from the absence of the concept of continuous innovation and inconsistent core business activities. In the end, the long-term performance development of MSMEs engaged in the creative industry tends to be stagnant and not well directed.

According to the LPPI Bank Indonesia (2015) in reality, MSMEs currently still face internal and external obstacles. Internally, problems often arise in business capital, human resources, understanding legality and accountability aspects. While externally, MSMEs are faced with intense business competition, infrastructure and business access. The limitation of the individual ability of MSMEs, especially in terms of financial management, can cause problems that affect the sustainability of MSME business processes. Thus, MSME actors are required to understand the financial risks that are often faced, including market risk, credit risk and liquidity risk. The level of financial literacy of MSME actors is then very important to be able to manage their business.

The character of MSMEs is inherent in the behavior of entrepreneurs in running their business (Ministry of Cooperatives and SMEs, 2013). Literacy can be defined as an individual's ability to obtain and evaluate the relevance of information in decision making and to understand every risk that may arise. The level of financial literacy affects the views of MSME actors in making strategic decisions on their business conditions (Amaliyah & Witiastuti, 2015; Puspitaningtyas, 2017). Susan (2020) showed that the level of financial literacy affects the ability to manage finances. Low financial literacy results in inefficiencies in business processes that affect the welfare of the parties involved in MSMEs (Calcagno & Monticone, 2015; Srikalimah, et al, 2020) whereas in today's business development, MSMEs are expected to have unique added value in their products and services (Aribawa, 2016).

Based on the results of a World Bank survey, Indonesia's financial literacy rate is only 20%. This is lower than ASEAN countries such as the Philippines 27%, Malaysia 66%, Thailand 73% and Singapore 98%. Many countries have conducted research on literacy levels related to national policies (Susan, 2020). Therefore, strategic efforts are needed to improve the performance and sustainability of MSMEs. One of the ways that can be done is by enriching the knowledge of MSME actors on financial knowledge so that management and accountability can be accounted better as befits a large company. Fatoki (2014) employed financial literacy assessment parameters, including variables such as financial management skills, investment knowledge, and financial planning, to determine the level of financial management skills in terms of budgeting, savings, and responsibility for credit usage. Individuals with low financial literacy are potentially vulnerable to financial crimes. They can be deceived by various investment models with promises of high returns. Those with low financial literacy will also find it challenging to improve their quality of life, as modern society is heavily intertwined with financial services, especially in the current global economy.

Micro, Small, and Medium Enterprises (MSMEs), as the largest informal sector driver in Indonesia with the highest employment absorption, play a crucial role in the economic system. According to Akpan et al., (2022), the quickest way to stimulate the economy in emerging markets is by focusing on developing the informal sector (MSMEs), which will result in an increase in middle-class income levels. Financial literacy from an individual or family perspective can have an impact on the ability to have long-term savings used for acquiring assets (such as land or a house), pursuing higher education, and building a retirement fund. Ineffective money management can lead to family financial crises (Pal et al., 2014). These findings can also be adapted to businesses. In this context, MSMEs with good financial literacy will be able to achieve their business goals, have a business development orientation, and be able to survive in challenging economic conditions.

In the literature of business and entrepreneurship, the lack of knowledge and access to financial resources has been linked to a company's inability to achieve its goals (Doherty et al., 2014; Tamvada et al., 2022) and the managers' inability to take strategic actions (Baumgartner & Rauter, 2017). Other literature also asserts that financial literacy and inclusion can enhance company growth (Eniola & Entebang, 2016; Grohmann et al., 2018).

Much literature has confirmed that a company's ability to recognize and access financial resources will have an impact on the company's growth rate (Adomoko, Danso & Damoah, 2016). In facing the industrial revolution 4.0, MSMEs that are mature in management and strong in financial management are expected to be the main key for Indonesia in competing in the global market. Financial literacy will help business actors related to business management starting from the budget, planning for saving business funds, as well as basic knowledge of finances to achieve business financial goals.

The purpose of this research is to analyze the financial literacy of MSME actors in Central Java province, analyze the financial literacy of MSME actors in affecting export and import decisions, analyze what individual factors could affect the financial literacy of MSME actors, and analyze what social factors could affect the financial literacy.

#### **RESEARCH METHOD**

The research design used by the author was clausal associative design, using a quantitative approach. The location of this research was the province of Central Java, Indonesia. The population of this research was all MSME actors in the province of Central Java, Indonesia. The research sample was MSME actors who had carried out export and import activities or those who were oriented towards carrying out export and import activities, totaling up to 110 respondents. The sampling method in this study used a proportional cluster random sampling.

The characteristics of the respondents were (i) having fewer than 50 employees, (ii) generating a minimum monthly revenue of IDR5,000,000.00, (iii) collaborating with financial institutions to support capital sufficiency, (iv) operating at the local or regional level and having a national or international market, (v) businesses with conventional business models, such as retail stores, restaurants, or local

service providers, art, handicrafts, and creative product businesses, agriculture, horticulture, or animal husbandry, or local food producers, (vi) businesses selling products or services through online platforms, such as online stores or sellers in the online marketplace, and (vii) businesses operating under specific franchise brands and adhering to established business models.

The data of this research were primary data obtained in distributing research questionnaires to respondents consisting of MSME actors in Central Java, Indonesia. Sources of data in this study were MSME actors who had carried out export and import or who planned to conduct international trade. The research variables measured in this study were the variables of general banking knowledge, basic financial literacy, basic financial attitudes related to accounting and budget records, and the skills of the owner in managing finances. The indicators for each variable are shown in Table 1, and how model works among variables shown in Figure 1.

Table 1. Variable and Indicator in SEM Path Analysis

Variables	Indicators
Individual (X <sub>1</sub> )	Prior Knowledge (X1)
	Cultural Experience (X2)
	Motivation (X3)
Social (X <sub>2</sub> )	Parental Support (X4)
	Allocated Money to Purchase Books (X5)
	Attitude Towards Reading (X6)
	Supporting Work Environment (X7)
	Economic Status (X8)
Literacy (Y <sub>1</sub> )	Having General Knowledge of Banking (Y1)
	Basic Financial Literacy (Y2)
	Basic Financial Attitudes Regarding
	Accounting and Budget Recording (Y3)
	Owner Skills in Managing Finances (Y4)
Export and	Attitude in Decision Making (Y5)
Import (E-I)	Export and Import Destinations (Y6)
(Y <sub>2</sub> )	Export and Import Planning (Y7)
	Action in Export and Import (Y8)



Figure 1. Thinking framework model

Structural Equation Modeling (SEM) analysis was performed by using software of Lisrel version 8.80.

Data analysis in this study was carried out by doing analysis of validity and reliability first, that is to determine the level of validity and consistency of an instrument using Lisrel version 8.80, an instrument can be said to be valid if the convergent validity value of the loading factor of CFA (Confirmatory Factor Analysis) was above 0.6, and the discriminant validity of AVE (Average Variance Extracted) was above 0.5 whereas for reliability testing, it used composite reliability values above 0.7. Secondly, inferential statistical analysis method was conducted using Partial Least Square Structural Equation Modeling technique.

#### **RESULT AND DISCUSSION**

#### **Characteristics of Respondents**

The research respondents consist of 110 MSMEs, whose characteristics can be seen in Table 2. These results provide an overview of the characteristics and distribution of the 110 surveyed MSMEs in terms of employees, income, collaboration with financial institutions, the scope of their operation, types of businesses, marketing methods, and whether they operate as franchise businesses or not. This information is valuable for understanding the diverse nature of these businesses and their strategies. The distribution of the existing characteristics indicates that MSMEs in Central Java still have a significant number of employees below 25, and the majority of them have a maximum monthly income of IDR25,000,000. Their level of operation has reached the national and international levels, supported by adequate digital-based marketing. Their businesses also originate from their own start-up initiatives.

#### Validity and Reliability

The validity measurement used the factor loading for the reflective indicator model or the component loading for the formative indicator model, if the factor loading was  $\geq 0.30$  or the factor loading and component loading of the indicator component were significant, so the relevant indicator fulfilled the validity. After testing the validity three times, the validity was obtained as shown in Table 3. The reliability analysis used was the internal consistency reliability by checking the Cronbach Alpha coefficient. If the value showed  $a \geq 0.50$ , it indicates that the questionnaire was reliable (Malhotra, 2004). The SEM construction results (Table 3) show that of the 16 indicators there were 14 valid indicators and 2 invalid indicators, namely indicator X6 and X8. Of the four variables formed by the indicators, there were 3 valid variable constructs and 1 unreliable construct, namely the indicator construct forming social variable. This was indicated by the value of construct reliability (CR) which showed the internal consistency of the indicator with a value of >0.70.

#### Table 2. Characteristics of Respondents

Characteristic/Criteria	MSME
	unit
Total of employees	
1-25 people	70
26-50 people	40
Income	
IDR5.000.000 – 25.000.000,	85
More than IDR 25,000,000,	25
Collaborate with financial institutions	110
MSME operation area	
at national level	48
At national and international levels	72
Bussiness type	
Crafts or creative products	42
Local food	36
Retail	32
Marketing by online	110
Franchise operation	
Franchise business	14
Non-franchise businesses	96

#### **Goodness of Fit**

Structural Equation Modeling tested the research hypothesis by evaluating the t-value on the structural model, which was  $\geq$ 1.96 (95% confidence level). After the model was evaluated for its indicators and constructs, it was then evaluated as a whole through the Goodness-of-Fit analysis shown in Table 4. The validity of SEM was tested through the Goodness-of-Fit Index which consisted of 18 parameters (Table 4). In addition, external factors were measured to determine whether there was an effect and a relationship to each variable.

It can be seen from Table 4 that the goodness of fit model has good results to explain the relationship between latent variables and their assumptions. Based on the combination analysis of the goodness of fit statistical parameters, 15 of the 18 parameters state that the causative model in this research model is generally considered good. This indicates that the individual, social, literacy, and export variables have a causative relationship with the indicators that composed these variables in the MSME population in Central Java.

#### **Factors Affecting Financial Literacy**

The SEM modeling (Figure 2) indicates the causal relationships between individual variables and indicators of prior knowledge, motivation, and culture; social variables and indicators of money allocated for book purchases, attitudes toward reading, a supportive work environment, and economic status; literacy variables and indicators of general banking knowledge, basic financial literacy, basic financial attitudes related to accounting and budgeting; export variables and indicators of decision-making attitudes, export-import objectives, export-import planning, and actions in export-import.

Variables	Indicator	Coeffi- cient	Error Var	R2 (%)	Std. Loading	CR	VE	Validity	Reliability
Individual	X1	0,64	0,23	65	0,80	0,878	0,717	Valid	Reliable
	X2	0,79	0,15	81	0,90			Valid	
	X3	0,31	0,29	25	0,50			Valid	
Social	X4	0,39	0,20	44	0,66	0,788	0,433	Valid	Not Reliable
	X5	0,35	0,36	25	0,50			Valid	
	X6	0,30	0,44	17	0,41			Invalid	
	X7	0,54	0,55	35	0,59			Valid	
	X8	0,28	0,30	21	0,46			Invalid	
Literacy	Y1	0,39	0,18	46	0,68	0,932	0,776	Valid	Reliable
	Y2	0,49	0,083	75	0,86			Valid	
	Y3	0,46	0,26	45	0,67			Valid	
	Y4	0,50	0,14	64	0,80			Valid	
Export	Y5	0,55	0,49	38	0,62	0,907	0,714	Valid	Reliable
	Y6	0,94	0,15	85	0,92			Valid	
	Y7	0,80	0,16	80	0,90			Valid	
	Y8	0,67	0,27	62	0,79			Valid	

Table 3. Validity and Reliability Analysis of Variability

Table 4. Goodness of Fit Analysis

Parameter	Acceptable Level of Equation	Model Index	Information
Chi-Square	The lower, the better	110.40	Good Fit
P-Value	p≥0.05	0,093	Good Fit
NCP	The lower, the better	18.40	Good Fit
GFI	GFI≥0,9 (good fit),	0.89	Good Fit
	0,8≤GFI<0,9 (marginal fit)		
RMR	RMR≤0,05	0.032	Good Fit
RMSEA	0,05 <rmsea≤0,08 (good="" (marginal="" 0,08<rmsea≤1="" fit),="" fit)<="" td=""><td>0.043</td><td>Good Fit</td></rmsea≤0,08>	0.043	Good Fit
ECVI	The closer to value of saturated ECVI, the better	(1.82;2.50)	Good Fit
NNFI	NNFI≥0,9 (good fit),	0.98	Good Fit
	0,8≤NNFI<0,9 (marginal fit)		
NFI	NFI≥0,9 (good fit),	0.94	Good Fit
	0,8≤NFI<0,9 (marginal fit)		
AGFI	$AGFI \ge 0.9$ (good fit),	0.83	Marginal Fit
	0,8≤AGFI<0,9 (marginal fit)		
RFI	$RFI \ge 0.9$ (good fit),	0.92	Good Fit
	$0.8 \le RFI < 0.9$ (marginal fit)		
IFI	$IFI \ge 0.9$ (good fit),	0.99	Good Fit
	$0.8 \le IFI < 0.9$ (marginal fit)		
CFI	$CFI \ge 0.9$ (good fit),	0.99	Good Fit
	$0.8 \le CFI < 0.9$ (marginal fit)		
PGFI	The higher, the better	0.60	Marginal Fit
PNFI	The higher, the better	0.72	Marginal Fit
AIC	The closer to value of saturated AIC, The better	(198.40;272)	Poor Fit
CAIC	The closer to value of saturated CAIC, the better	(361.22;775.27)	Poor Fit
CN	$CN \ge 200$	121.02	Poor fit



Figure 2. SEM analysis of the hybrid model

The calculation results (Figure 2) show that in the 1st order CFA, the standardized factor loadings for each indicator of individual, literacy, and export variables were greater than the critical value of 0.50. However, for the indicators of social variables, specifically X6 and X8, they were less than 0.5. The causal relationships between the indicators and their respective variables were also explained by R2, and the average R2 obtained from the 16 indicators was more than 20%. The most significant causal relationship was reflected by the Y6 indicator at 81% in forming the construct of the export variable. Based on this, there was a high causal effect among variables and their indicators.

Conclusion of a significant relationship, the t-value must be greater than the t-table. A significant relationship would be indicated by a black t-value on the path diagram with a value of 1.96. The results of the calculation show that the CFA 1st order standardized factor loading on each variable indicator of individual, literacy, and export was more than the critical value of 0.50 while the indicator on social variables, namely X6 and X8, were less than 0.5. The causative relationship between the indicator and the variable was also explained by R2, the average R2 obtained from the 16 indicators was more than 20%. The largest causative relationship was reflected in the

indicator Y6 at 81% in forming the construct of the export variable. Based on this result, the variables and their indicators had a high causative effect.

Table 5. Test of the significance of t-count and the Coefficient of Structural Equation

Path	Coefficient	t-value
Individual factors to financial literacy	0,94	5,72*
Social factors to financial literacy	-0,05	-0,39
Financial literacy to export and	0,65	4,74*
import decisions		

On Table 5, it can be seen that there was a significant causal relationship between individuals and financial literacy and between financial literacy and exports, while social variables and financial literacy were insignificant. Referring to Table 4, it states that there is a positive and significant effect of individual variables on export and import decisions mediated by financial literacy. Seen in the path diagram above, the results of the model test show a t-value of 5.72 (95% confidence level), which means that the t-value was >1.96. This indicates that the causal relationship was significant. The path diagram of the results of the causal relationship states that there was a positive and significant effect of social factors on export and import decisions mediated by financial literacy, show that the

t-value was -0.39 (95% confidence level), which means the t-value <1.96.

The result states that there is a positive and significant effect of financial literacy on export and import decisions, the t-value was 4.74 (95% confidence level), which means that the t-value was >1.96. This indicates that there was a significant and positive or associative relationship between financial literacy and the export and import decisions of MSME actors in Central Java. Individual factor variables had a positive effect on financial literacy, while social factor variables had a negative effect on financial literacy by 0.83 or 83%. Financial literacy had a positive effect on export and import by 0.42 or 42%.

The test proves to be accepted because the t-value is 5.72 (95% confidence level) >1.96, which means that there is a significant effect between the individual ability variables on export and import decisions mediated by financial literacy, as supported by research by (Bilal, et al, 2021) which stated that the parameters of the assessment of financial literacy with the variables of financial management skills, investment knowledge and financial planning are used to determine the level of financial management skills in terms of budget, savings and responsibility for using credit. In addition, it is confirmed by the results of research by Jain et al. (2014) which stated that good financial literacy allows indiviuals to have skills and knowledge, so that they are able to make appropriate and effective decisions.

Researchers analyze that the ability variables possessed by individuals affect MSME actors to make decisions in export and import activities, which of course were guaranteed to have good financial literacy. MSME actors with the ability to manage their potential, knowledge of MSME management and high business motivation are sure to have a long-term vision and mission; one of which was business expansion in the form of exports and imports. The decision to export and import certainly cannot be separated from how much potential and skills individuals have but also the extent of their financial literacy, because every business activity is related to finance.

Furthermore, the t-value is 5.72 (95% confidence level) >1.96, which means that there is no positive and significant effect of social factors on export and import decisions mediated by financial literacy. The coefficient value is -0.05, this condition means that the small coefficient value does not encourage a

significant and strong relationship between social factors, financial literacy and export and import decisions. This is presumably due to the absence of support from parents, budget allocation to support entrepreneurial potential, work environment and parents' socioeconomic status.

The results obtained apparently do not support research from The Association of Chartered Certified Accountants (2014) which formulated that the concept of financial literacy includes knowledge of financial concepts, the ability to understand communication about financial concepts, the ability to manage personal or company finances and the ability to make financial decisions in certain situations. Based on the formulation of the concept of financial literacy, social factors play a role in understanding communication regarding financial concepts, which leads to the ability to make decisions, both financial and business, which in this study were decisions to carry out export and import activities.

The results of testing obtained a t-value of 4.74 (95% confidence level) where the t-value >1.96, which means that there is a significant and positive effect of financial literacy on export and import decisions. This is supported by previous research conducted by Puspitaningtyas (2017) which stated that the level of financial literacy affects the views of MSME actors in making strategic decisions on business conditions, one of which is the decision to export for business expansion or import product raw materials. The results reject the results of Djuwita & Yusuf (2018) research which revealed that MSMEs in the creative industry tend to have a short-term orientation in decision making in their business, due to the absence of a concept of sustainable innovation and inconsistent core business activities.

Entrepreneurs with good financial literacy are able to use their financial skills in making decisions that are right for their business (Nguyen & Nguyen, 2020). MSME owners/managers are closely related to making complex and strategic financial decisions related to the success of achieving goals and business sustainability (Aboelmaged, 2018; Draxler, Fischer & Schoar, 2014; Kerr, Lerner & Schoar, 2014). The overall results of this study confirm previous research conducted by Adomoko, Danso & Damoah (2016); Dahmen & Rodríguez (2014); Fatoki (2014); and Wise (2013). In general, their research stated that if entrepreneurs in the MSME sector have adequate financial literacy skills, the business and financial decisions that will be
made will lead to improved development over time, increase the ability of businesses to survive the crisis and ultimately make the business have long-term sustainability.

MSMEs have unique characteristics to face changes in the business environment and stakeholders (Rekarti et al., 2018). MSMEs have cooperative characteristics in running their businesses to complement their limitations and gaining a competitive advantage. In global competition, MSMEs are expected to be able to provide value added to the goods and services offered both in quality and efficiency than competitors. MSMEs with good financial literacy will be able to achieve their company goals, have a business development orientation so that they are able to compete with MSMEs from various countries, and able to survive in difficult economic conditions.

#### **Research Implication**

Research findings can inform policymakers about the significance of financial literacy for MSMEs engaged in export-import activities. This may lead to the development of targeted policies and programs to enhance financial education and support for these businesses (Birochi & Pozzebon, 2016). This leads to the following implications:

Informing Policymakers. This part suggests that the research results can serve as valuable information for government policymakers. Policymakers are individuals or groups responsible for creating and implementing laws, regulations, and policies related to various aspects of the economy, including support for businesses.

Significance of Financial Literacy. The research findings highlight the importance of financial literacy for MSMEs involved in export-import activities. Financial literacy refers to the understanding and knowledge of financial concepts, including budgeting, financial planning, investment, and managing financial resources. In this context, it pertains to the ability of MSMEs to make informed financial decisions regarding their international trade operations.

Development of Targeted Policies. Based on the research findings, policymakers may recognize the need to develop specific policies and initiatives. These policies would be designed to address the financial literacy needs of MSMEs participating in export-import activities. Instead of a one-size-fits-all approach, these policies would be tailored to the unique challenges and opportunities faced by MSMEs in international trade.

Financial Education and Support. The ultimate goal of these policies is to enhance financial education and support for MSMEs. This can take various forms, such as offering financial literacy training programs, creating educational materials or resources, providing access to financial advisors or mentors, promoting collaboration between financial institutions and MSMEs.

Benefits for MSMEs. The intended outcome of these policies is to equip MSMEs with the necessary knowledge and skills to make well-informed financial decisions when engaging in export-import activities. This, in turn, can lead to improved financial management, risk mitigation, and overall success in international trade endeavors.

For access to financial services, improved financial literacy can lead to increased access to financial services for MSMEs. Policymakers and financial institutions may consider initiatives to provide more accessible financial services for these businesses. Policymakers and financial institutions are encouraged to take action by implementing initiatives to ensure that these services are readily available and cater to the unique needs of MSMEs. This, in turn, can stimulate the growth and success of these businesses and contribute to the broader economic well-being of the region or country.

The research emphasizes the importance of financial inclusion for MSMEs. Efforts to promote financial inclusion can contribute to better financial decision-making within the sector. By promoting financial inclusion, policymakers, financial institutions, and organizations can help MSMEs make better financial decisions, ultimately contributing to their success and the overall economic development of the region or country.

Governments and organizations can provide additional support to MSMEs involved in international trade by offering financial literacy programs and facilitating access to global markets. Various ways in which governments and organizations can provide crucial support to MSMEs engaged in international trade. This support can include financial literacy programs, access to global markets, training, resources, networking, and other initiatives aimed at helping these businesses thrive in the global arena. Collaboration between financial institutions and MSMEs may be enhanced, focusing on providing financial literacy resources and products tailored to the unique needs of this sector.

In term of training and education programs, the research highlights the need for training and educational programs to improve the financial literacy of individuals involved in MSMEs. These programs can be designed to cater to specific needs identified in the study.

The findings may also prompt discussions on adapting international trade policies to accommodate the specific challenges and opportunities faced by financially literate MSMEs involved in export-import activities. Research findings may initiate conversations about adapting international trade policies to better accommodate financially literate MSMEs engaged in export-import activities. These discussions can lead to the development of policies that recognize the unique needs and potential contributions of these businesses to international trade. These research implications offer a roadmap for addressing the financial literacy challenges faced by MSMEs in their export-import decisions and exploring the broader economic and social benefits of improving their financial capabilities.

The managerial implication of this research is that there are big challenges for MSME actors to increase financial literacy, so that entrepreneurs are able to make appropriate management and financial decisions for business success and sustainability, and had the advantage of competing with MSMEs, both nationally and internationally. This research also provided insights for stakeholders who had a role in increasing the level of financial literacy in Indonesia, in this case the Government (BI, OJK and related Ministries) should act as an aggregator or facilitator to share knowledge regarding financial literacy between MSMEs, MSMEs with academics, and MSMEs with related communities as well as MSMEs with the national private sector (financial or non-financial service sector).

#### **CONCLUSION AND SUGGESTION**

The conclusion of this study is that there is a significant effect between individual ability and financial literacy and between financial literacy and export and import decisions, while between social variables and financial literacy, there is no significant effect. MSMEs have cooperative characteristics in running their businesses to complement each other's limitations and gain specific competitive advantages to

compete in the global environment, especially export and import activities, so that they can contribute to the national economy.

The suggestion that the researchers put forward in this research is that in the future, it is hoped that there will be many researches with a more applicable perspective for the development of MSMEs in Indonesia. Improvements to this research can be done, among others, by expanding the sample coverage to be wider, modifying the model to be more complex, or by expanding the range of measuring indicators.

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# Efficiency, risk, and profitability of rainfed rice farming in South Sulawesi, Indonesia

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#### **ARTICLE INFO**

#### ABSTRACT

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Rice farming is a business that has many risks, and production risks cause fluctuations in production. Productivity influences farming income and profitability. An increase and decrease in production will affect revenue or profitability. The purpose of this study is to analyze the technical efficiency, production risk, and profitability of rainfed lowland rice farming. This research was conducted in two regencies in South Sulawesi Province, namely Maros Regency and Pangkajene Islands Regency. The sample of this study was 100 farmers in rainfed rice fields. This research used quantitative methods with a survey approach. Data were collected using observation, recording, and interview instruments, and were then analyzed using quantitative description coupled with a t-test for independent samples. The results showed that rainfed lowland rice farming in Maros Regency and Pangkajene and Archipelago Regency was technically efficient. Rainfed lowland rice farming in Maros Regency and Pangkajene Regency and Islands is at risk. Rainfed lowland rice farming in Maros Regency and Pangkajene Regency and the islands using profitability analysis generates income and profit, and is feasible to cultivate. Farmers need to use production inputs as recommended to increase production reduce production risk and efficiently use inputs.

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#### **INTRODUCTION**

The agricultural sector is one of the sectors that is relied upon to support the rate of national economic growth (Arouna et al., 2021; Prasetyo et al., 2020; Saediman et al., 2020). Rice is included as a strategic food commodity to continue to be developed. This is because rice is still the main food ingredient for Indonesian people both in rural and urban areas (Arifin et al., 2021b; Heriqbaldi et al., 2015; Purba et al., 2020). The government places rice as a strategic commodity in economic development and rice selfsufficiency is a development target (Kerdsriserm et al., 2018; Rasyid et al., 2016). Efforts to increase rice production become very important along with the increase in population and the food industry (Barokah et al., 2022; Rizwan et al., 2020). The large population has resulted in the need for food, especially rice as a staple food for the community, to be very important, needed in large quantities and available continuously (Rani & Singh, 2015; Wardie & Sintha, 2018). Rainfed rice fields have the potential to be used as areas to increase rice production (Arifin et al., 2019). Rainfed lowland rice farming is the highest contributor to national rice production after irrigated lowland rice farming (Arifin et al., 2021a).

Farming activities in obtaining production go through long stages and there are risks. Time and production are parts of determining factors in crop yield (Dewati & Waluyati, 2018). Increasing rice productivity is closely related to the ability of farmers to allocate various production factors efficiently so that they can reach the point of maximum potential in their farming activities (Kerdsriserm et al., 2018). In farming for agricultural commodities, farmers are not always able to achieve the expected level of efficiency and productivity (Hou et al., 2020). The low level of efficiency in the use of production factors shows that the results of farming production carried out by farmers have not been maximized (Mulyadi et al., 2021). Several ways to increase rice production include allocating more land to produce rice, developing and adopting new technologies to production, and managing available increase resources more efficiently (Umar et al., 2020). The allocation of efficient and effective use of production factors, as well as being ability to adapt to climate change, will determine the achievement of farming efficiency (Arifin et al., 2019; Ouedraogo, 2015).

The agricultural sector is a business that is always faced with yield variability in situations of high risk and uncertainty (Dadzie et al., 2022; Obadoba & Umar, 2019). An important source of uncertainty in the agricultural sector is agricultural output (Zakaria & Indah, 2019). Internal sources of risk are production and technical risks that occur due to the technical relationship between output and level of input use (Mitra & Sharmin, 2019). The risk of agricultural production is greater than the risk of nonagriculture because agriculture is strongly influenced by nature such as weather, pests and diseases, temperature, drought, and flooding (Ferrianta et al., 2015). Risk is used more in the context of decisionmaking because risk is defined as the chance that an adverse event will occur as a result of an action (Lien et al., 2022). Rice farming is a business that has many risks (Kabir et al., 2021). Human resources, production inputs, and natural factors can contribute to production risk (Pervez et al., 2022). Production fluctuations are caused by production risks in the agricultural sector (Arifin et al., 2021a).

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The level of farmers' income, in general, is influenced by several components: the amount of production, selling prices, and costs incurred by farmers in their farming (Abdullahi et al., 2021; Chaudhary & Suri, 2022). Productivity has a positive effect on farm income and profitability. High productivity leads to high farmer acceptance with efficient production costs so that farmers' income and farm profitability will increase (Bozkurt & Kaya, 2021). Increases and decreases in production affect farmers' income or profitability and welfare (Ifeoma et al., 2022).

Maros Regency and Pangkajene Islands Regency are regencies whose rice fields are dominated by rainfed rice fields in South Sulawesi Province. Maros Regency has an area of 26,114.06 ha of paddy fields, consisting of 17,072.56 irrigated rice fields and 9,041.50 ha of non-irrigated rice fields. From the paddy field area, production of 324,323.11 tons was obtained with a productivity of 4.70 tons/ha (BPS Kabupaten Maros, 2019). Meanwhile, Pangkajene Islands Regency (Pangkep) has a rice field area of 16,764 ha consisting of 9,929 ha of irrigated rice fields and 6,835 ha of non-irrigated rice fields. Lowland rice production in Pangkajene Islands Regency is 120,903.74 tons with a productivity of 4.60 tons/ha (BPS Kabupaten Pangkajene Kepulauan, 2019).

Research on technical efficiency and production risk for lowland rice farming has been carried out separately in Maros and Pangkajene and Islands districts. However, research that combines technical efficiency, production risk, and profitability has never been carried out in these two districts. Likewise, integration of research at the national and global levels is still rarely carried out. The purpose of this study is to analyze the technical efficiency of rainfed lowland rice farming, the production risk of rainfed lowland rice farming, and the profitability of rainfed lowland rice farming.

#### **RESEARCH METHOD**

This research was conducted in two districts in South Sulawesi Province, namely Maros Regency (Lau District, Soreang Village and Tompobulu District, Tompobulu Village), and Pangkajene Islands Regency (Minasatene District, Bonto Kio village and Labakkang District, Pacikong Baja Village). The research location was chosen purposively with the consideration that it is an area that has extensive rainfed rice fields in South Sulawesi. The research period was from October to November 2021.

This study used quantitative research method with a survey approach. Data consisting of primary data and secondary data were collected using observation and interview techniques. The population in this study were farmers who cultivate rainfed rice at the research site. The total population was 1,178 farmers, consisting of 634 farmers from Maros Regency and 544 from Pangkajene Islands Regency. The number of respondents was 100 farmers. Samples were selected using the proportional random sampling method at four research sites. Data were analyzed using the quantitative descriptive technique with an independent sample t-test.

The technical efficiency analysis used is as follows.

$$TER = \frac{Y_i}{\overline{Y}}$$

Where TER is the technical efficiency rate, Y is potential production, and Yi is the actual production. If TER value <0.80, it means that farmers are not efficient in using production inputs in rice farming in rainfed rice fields. TER value 0.80 - 1.00 means that farmers are efficient in using production inputs in rice farming in rainfed rice fields (Sumarno et al., 2015).

Production risk was analyzed by determining the magnitude of the coefficient of variation. Production risk can be measured by the magnitude of the variance and standard deviation. The coefficient of variation can mathematically be written as follows.

$$CV = \frac{\sigma}{\overline{X}}$$
$$\sigma = \sqrt{\frac{\sum x^2}{n}}$$
$$x = X - \overline{X}$$

Where CV is the coefficient of variation production,  $\sigma$  is production standard deviation (variance),  $\overline{X}$  is production average, n is the number of samples. In this (Asbullah et al., 2017), if CV value 0.50, farmers are protected from production risks in carrying out rice farming in rainfed rice fields. CV value > 0.50 means that farmers are at risk of production in carrying out rice farming in rainfed rice fields.

To analyze the profitability of rainfed lowland rice farming, the following formula was used (Adiwinata et al., 2017; Fauzan, 2014):

1. Net Farm Income (NFI)

NFI = GM - TFC

$$GM = TR - TVC$$

Where GM is gross margin (IDR), TR is total revenue (IDR), TVC is total variable cost (IDR), and TFC is total fixed cost (IDR),

2. Return on Investment (ROI)

$$ROI = \frac{Profit}{Production Cost} X 100\%$$

Where Profit is the difference between the production value and the total cost of production (IDR). Production cost is costs incurred during production (IDR). It used the criteria: (i) if ROI > 50%, this means that rainfed rice farming is profitable to carry out, and (ii) if ROI <50%, this means that rainfed lowland rice farming is not profitable to carry out.

3. Break Event Point (BEP)

$$BEP = \frac{FC}{1 - \frac{VC}{S}}$$

Where FC is fixed cost (IDR). VC is variable cost (IDR), S is profit (IDR). It used the criteria (i) if the receipt of rain-fed rice farming > BEP means worth working on; (ii) if the receipt of rain-fed rice farming <BEP means it's not worth the effort.

#### **RESULT AND DISCUSSION**

#### **Respondent Characteristics**

The characteristics of the respondent farmers are a general description of the condition of farmers who cultivate rice in rainfed rice fields. The characteristics of the respondent farmers in this study consisted of the age of the farmer, the level of education of the farmer, the area of arable land, and experience in rice farming. The characteristics of the respondent farmers are presented in Table 1.

Farmers had an average age of 51.2 years, with a minimum age of 22 years and a maximum age of 76 years. The most dominant age group was 41-60 years (67%), followed by the age group 61-80 years (17%) and 20-40 years (16%). Based on this age group, the productive age of farmers dominates as the main actor in rice farming activities. Productive age is closely related to physical abilities and decision-making abilities. The age of a rice farmer

affects performance in production. Younger ages usually have a stronger physique at work (Sari et al., 2022). As the age of the farmer increases, the experience and skills in rice farming will increase, and it will have a positive effect on rice production (Zakaria & Indah, 2019).

Table 1. Respondents' Characteristics

Variable	Frequency	Percentace
	people	%
Farmer's age		
20-40 years	16	16
41-60 years	67	67
61-80 years	17	17
Average (years)	51.2	
Education level		
Elementary school	49	49
Junior high school	11	11
Senior high school	37	37
Bachelor	3	3
Farm size		
0.10-0.50 ha	64	64
0.51-1.00 ha	30	30
1.10-1.50 ha	3	3
1.51-3.00 ha	3	3
Average (ha)	0.4	
Farming experience period		
≤10 years	3	3
10-25 years	37	37
>25 years	60	60
Average (years)	29.6	

The highest level of education of farmers was elementary school graduates, followed by high school, junior high, and undergraduate graduates, respectively. This shows that the level of formal education of farmers is still low. The level of education influences the quality of human resources to manage farms run by farmers and also affects more advanced ways of thinking (Umar et al., 2020). Generally, rice farmers who have a higher level of education will have a better ability to accept innovation when compared to farmers who have never gone through a high level of formal education (Sari et al., 2022). Although their level of formal education was low, the farmers had been running their farm for a long time. Most of the farmers have been running rice farming since they were small and have experience. They also attended non-formal education from various activities like counseling and training. The goal those activities is to increase the knowledge of farmers to support implementation in their farming.

The area of arable land managed by farmers was dominated by an area of 0.10-0.50 ha (64%). This

shows that the area of arable land cultivated by farmers is still narrow. To increase production and income obtained by farmers, the area of arable land needs to be increased (Gara et al., 2021; Iskandar & Jamhari, 2020). The addition of land area will increase the population of lowland rice plants. The increase in the population of lowland rice plants can increase lowland rice production. Some farmers worked on their land, and some worked on other people's land with a profit-sharing system. The profitsharing system applied was that half of the harvest was given to landowners and the other half was given to smallholders (50% each for land owners and sharecroppers in the form of goods/grain or money). Cultivators were responsible for managing their farms from tillage to harvesting.

Based on Table 1, the farmers' experience in farming is mostly over 25 years, as many as 60%. This means that most of the farmers have been running rice farming for a long time, and most of the farmers continue the farming that their parents had run. The farmers' experience was inherited from their parents and supported with non-formal education from agricultural extension workers. Farmers developing their farms obtained farming skills from the experience of these farmers. Farmers with longer farming experience have better skills and understanding to manage and run their farms. The length of experience in farming affects the perception of farmers in accepting technological innovations from outside. Farmers who have been farming for longer find it easier to implement innovations than novice farmers (Sari et al., 2022).

#### **Technical Efficiency**

Increasing rice production requires improving rice field infrastructure, intensifying the use of rice planting technology, and changing farmers' perceptions about rice farming. The efficiency of rice production can be increased by adding labor, mechanical power, and irrigation to rice fields (Zeng et al., 2023). The technical efficiency of rice farming in rainfed rice fields in two regencies, namely Maros Regency and Pangkajene Islands Regency, can be seen in the difference in the results by using the independent sample t-test. The results of the analysis of the technical efficiency of rice farming in rainfed rice fields can be seen in Table 2.

Table 2 shows that Maros Regency and Pangkajene Islands Regency are technically efficient.

This is based on the criterion of the level of technical efficiency, which is between 0.80-1.00. With this criterion, it is found that more farmers were more efficient than inefficient in the two districts. The results of the t-test analysis of technical efficiency showed that the values of t-count and t-table had significant differences between farmers in Maros Regency and Pangkajene Islands Regency. This means that there were differences in technical efficiency between farmers in the two districts, i.e., the efficiency in Maros Regency was lower than that in Pangkajene Islands Regency. The number of technically efficient farmers in Maros Regency was 54.00%, while in Pangkajene Islands Regency was 74.00%. The number of technically inefficient farmers in Maros Regency was 46.00%, and Pangkajene Islands Regency was 26.00%.

Table 2.	Results of Technical Efficiency Analysis of
	Rainfed Rice Farming in Maros Regency and
	Pangkajene Islands Regency

Taskaisel Efficience	Maros	Pangkajene	
	Regency	Islands Regency	
Average value	0.78	0.81	
Minimum value	0.50	0.50	
Maximum value	0.97	0.94	
Efficient percentage	54.00	74.00	
Inefficient percentage	46.00	26.00	
Technical efficiency t-test:			
t-count (Maros with	n Pangkajene 2.082**		
Kepulauan)		(1.990)	
t-table (a = 5%)		-	

Source: Processed Data, 2023

The difference in technical efficiency is due to the area of cultivated land in Pangkajene Islands Regency being larger than Maros Regency. Likewise, the use of urea and phonska fertilizers is greater and closer to the recommended fertilizer use in Pangkajene Islands Regency, which is wider than Maros Regency. Meanwhile, there was no difference in farming experience between the two regencies. Therefore, it can be interpreted that farmers in the Pangkajene Islands Regency are more technically efficient in terms of using production inputs to manage rice farming in rainfed lowland areas (Suharyanto et al., 2015). Farmers were not always able to achieve the expected level of efficiency and productivity even though they had long experience in farming agricultural commodities. This is because one of the influencing factors is the intensity of input use (Iskandar & Jamhari, 2020). The difference in the level of technical efficiency achieved by farmers

indicates that the level of mastery and application of technology is different. The use of mobile phones is correlated and significant with reducing the inefficiency of rice farming along with farmer education and the implementation of irrigation (Kusumaningsih, 2023). The different levels of technical mastery of farmers are caused by internal factors within farmers such as education, age, farming experience, frequency of attending counseling, and external factors such as land conditions (Arifin et al., 2019).

#### **Production Risks**

Risk in farming is unavoidable because all forms of business must have risks in them. The risk of rice farming production is related to the production obtained by farmers (Rizwan et al., 2020). For the production risk of rainfed lowland rice farming in Maros Regency and Pangkajene Islands Regency, the difference can be known by using the chi-square test analysis. The results of the production risk analysis can be seen in Table 3.

The results of the analysis of the different tests of variance are shown in Table 3. The values of Fcount and Ftable have differences that have a significant effect on farmers in Maros Regency and Pangkajene Islands Regency. There were differences in production risk between farmers in the two districts in terms of variance, where the production risk for farmers in Maros Regency was smaller than for farmers in Pangkajene Islands Regency. The difference in production risk happened as farmers in Maros Regency did not dare to take risks, thinking if they wanted greater production results, they also faced greater risks. This is because most farmers in Maros Regency were underprivileged farmers and only relied on labor in the family. Small farmers are more risk-averse and rice farmers face many risks. Risk-averse farmers will allocate their labor to offfarm jobs (Rizwan et al., 2020). The limitations of these farmers had an impact on their ability to use production inputs to increase their farming results. The average use of the input was still lacking and did not meet the recommended recommendations. Risk is used more in the context of decision-making because risk is the opportunity for an adverse event to occur as a result of an action. The higher the level of uncertainty of an event, the higher the risk caused by decision-making (Dewati & Waluyati, 2018).

Table 3. Analysis of Variance and (	Coefficient of	Variation of	f Rainfed	Rice	Farming	in Maros	Regency	and
Pangkajene Islands Reger	ncy							

Variant	Coefficient of Variation
882,886.89	0.70
3,212,300.00	0.70
	16.071***
	(1.998)
	0.000 ns
	(3.841)
	Variant 882,886.89 3,212,300.00

Table 4. Profitability Analysis of Rainfed Rice Farming in Maros and Pangkajene Kepulauan Regency

No.	Item	Maros Regency	Pangkajene Kepulauan Regency
1	Profit (IDR)	5,797,490.00	11,100,092.00
2	Variable Cost (IDR)	2,366,907.00	4,019,530.18
3	Tetap Cost (IDR)	430,800.17	198,701.00
4	Total Cost (IDR)	2,797,707.17	4,218,231.18
5	Income (IDR)	2,999,782.83	6,881,860.82
6	Net Farm Income (IDR)	2,999,782.83	6,881,860.82
	Net Farm Income t-test:		
	t-count (Maros with Pangkajene Kepulauan)		4.354***
	t-table (a = 1%)		(2.414)
7	Return on Investment (%)	95.76	143.17
	Return of Investment t-test:		
	t-count (Maros with Pangkajene Kepulauan)		3.227***
	t-table ( $a = 1\%$ )		(2.414)
8	Break Event Point (IDR)	802,132.77	353,596.25
	Break Event Point t-test:		
	t-count (Maros with Pangkajene Kepulauan)		4.599***
	t-table ( $a = 1\%$ )		(2.414)

For the value of the coefficient of variation of farmers in Maros Regency and Pangkajene Islands Regency, there was no difference in production risk, but the two districts were at risk based on the criterion that CV was greater than 0.50. Both districts had a coefficient of variation of 0.70. Based on the results of the analysis of the chi-square test  $(\chi 2)$  in Table 3, it shows that the value of 2count was smaller than the value of 2table. This means that the production risk of farmers in Maros Regency is the same as the production risk of farmers in Pangkajene Islands Regency. There was a similarity between farmers in Maros Regency and Pangkajene Islands Regency, in that they avoided risks in running their farms. According to Mitra & Sharmin (2019), sources of risk in agriculture include production and technical risk, namely production risk that occurs when there is a technical relationship between output and level of input use. The courage of farmers in making decisions is strongly influenced by the risk conditions of their farming. Dadzie et al. (2022) mentioned that

the risk of farming is more concentrated on the individual side of small farmers.

#### Profitability

Profitability analysis is very necessary to find out the profits obtained in the business and is also used as a measuring tool to determine the development of the business that is being carried out (Arifin, 2022). Farming profitability is the ability of farming to generate profits. Two important components in calculating farm profitability are the revenue and costs of rainfed lowland rice farming. In this study, the calculated cost component is the cost incurred by the farmer (cash cost). The results of the profitability analysis can be seen in Table 4.

Based on the results of the profitability t-test analysis shown in Table 4, the values of t-count and t-table had a difference and had a significant effect on farmers in Maros Regency and Pangkajene Islands Regency. This means that there are differences in profitability in NFI, ROI, and BEP between farmers in the two districts. For Net Farm Income, the results show that there was a difference in value, where Pangkajene Islands Regency was greater than Maros Regency. The difference in values in the two districts can be proven by the results of the t-test analysis with a 99% confidence level or 1% error.

For the Return on Investment (ROI) the result obtained was 95.76% for Maros Regency and for Pangkajene Islands Regency was 143.17%. The ROI results obtained from the two districts were greater than 50%, meaning that the efficiency level of capital use in rainfed lowland rice farming for one harvest season exceeds or is greater than the criteria. It can also be interpreted that for every IDR1 that Maros Regency farmers spent, they had a profit of IDR95.76 or 95.76% when compared to production costs. For Pangkajene Islands Regency farmers, each IDR1 expenditure earned them a profit of IDR143.17 or 143.17% when compared to production costs. Thus, rainfed lowland rice farming in Maros and Pangkajene Islands is profitable. Both regencies provide profits of 50% or more. One of the reasons is that most farmers used family labor in their farming activities, especially from tillage to maintenance. Only some farmers used labor from outside the family to harvest. This way, farmers could save on labor costs. One component that incurs a lot of labor costs in farming activities is planting and harvesting costs. Based on the results of ROI and t-test analysis with a 99% confidence level or 1% error, there are differences in the two districts. The value of ROI and profits obtained by Pangkajene Kepulauan Regency is greater than that of Maros Regency.

The Break Event Point (BEP) was IDR802,132.77 in Maros Regency and IDR353,596.25 in Pangkajene Islands Regency. The BEP results obtained from the two districts were lower than the average actual revenue. The average actual revenue of Maros Regency is IDR5,797,490.00 and Pangkajene Islands Regency IDR11,100,092.00. Thus, rainfed lowland rice farming in Maros Regency and Pangkajene Islands Regency is feasible. The BEP results were lower than the actual revenues of the two districts, indicating that the income earned by farmers from their farming results exceeds the variable and fixed costs that must be incurred. Based on the results of BEP and t-test analysis with a confidence level of 99% or an error of 1%, there were differences in the two districts. The BEP value and the actual average

revenue obtained by Pangkajene Islands Regency were greater than that of Maros Regency.

#### **Research Implication**

There are various ways to increase production, i.e., by increasing land area, making new technological innovations, optimizing land use, and increasing technical efficiency through the use of existing resources. Increasing production through technical efficiency is relevant to be done at this time and also necessary for farmers in Maros Regency and Pangkajene Islands Regency. Increasing productivity is currently not possible through land expansion and in the short-term technology adoption is difficult (Rani & Singh, 2015). Efforts to increase production and obtain maximum profit from lowland rice farming should be done by taking into account the technical efficiency of the use of the production factors used (Khounthikoumane et al., 2021). In corn farming, it has been found that the technical efficiency of corn farmers who use mobile phones in the production process is greater than those who do not (Kusumaningsih, 2023). It is important to increase productivity through technical efficiency. The higher the efficiency, the more profitable it will be because efficiency can explain the optimal combination of various factors of production. The achievement of efficiency is not only influenced by the number and types of production factors and management but it is also influenced by environmental factors in which farming is developed (Arifin et al., 2019).

Rice farming carried out by farmers will face various kinds of situations, both beneficial and detrimental. Adverse situations are commonly referred to as risks (Mitra & Sharmin, 2019). All agricultural commodities, in this case, rainfed lowland rice farming, are cultivated by farmers both in Maros Regency and in Pangkajene Islands, where the main problem lies in production. Production problems are related to the nature of farming which always depends on nature and is supported by risk factors. The production risks that cause the most losses to farmers are the presence of pests and diseases, the frequency of floods, and droughts that cannot be predicted in advance (Arifin et al., 2019). Production risk occurs due to the technical relationship between output and the level of input use, prices, finance, government policies, and individuals (Zakaria & Indah, 2019). The size of the risk faced by farmers will have an impact on the level of production and income obtained by farmers. The higher the risk faced by farmers, the higher the chance of experiencing losses (Andayani et al., 2020). One of the efforts that can be taken to reduce and minimize the risk of lowland rice farming is taken increase the ability of farmers in their farming through extension activities.

Rainfed lowland rice farming in Maros Regency and Pangkajene Islands Regency uses profitability analysis with the approach of NFI, ROI, and BEP to generate income and profit while the crop is feasible to cultivate. Farmers' incomes are generally influenced by several components, namely the amount of production, selling prices, and costs incurred by farmers in their agricultural businesses (Ifeoma et al., 2022). The optimal allocation of inputs affects the costs that must be incurred. The increase and decrease in production will affect farmers' income (Suyatno et al., 2018). The implementation of rice farming by farmers must have the right considerations in production to obtain the best profit (Defidelwina et al., 2019). The best or maximum profit is achieved when the production level is optimal. To obtain the optimal level of production, the producer must take into account the amount of production that is in a position of balance or profit, and if it is reduced/added it will lose. Optimal production occurs when production activities provide the largest difference between revenues and costs. Efficient use of costs is the first step in determining optimal production (Arifin, 2022).

Based on the findings of this research, in terms of efficiency, most farmers are technically efficient. This indicates that the use of production inputs is as recommended as expected. Farming efficiency is very important to find sources of agricultural productivity growth. The success of increasing agricultural productivity is determined by the ability to create technology that can be applied and developed ecologically and economically in each region (Adhiana et al., 2021; Aprianti et al., 2020). The findings of this research can provide an overview of the positive impact on national and global economic development as expected and sustainable.

The agricultural sector has an important role in human life because it can provide the life basic needs, especially food. The agricultural sector is a source of income that improves community welfare and supports the rate of national economic growth (Rahmat et al., 2017). This indicates that agriculture has an important role in the national economy. Rainfed rice fields is one type of land that can be used to provide national food needs. One of the crops cultivated in rainfed rice fields is rice. Rainfed rice fields have low fertility and water availability but are still a source of income for farmers (Sahara & Supriyo, 2022).

Current and future agricultural development is not limited to increasing productivity, but also policies that support sustainable formulating development by increasing human resources and enabling farmers to play a role in the development process (Ramlawati, 2020). Agricultural development in Indonesia is directed towards sustainable agricultural development, as a part of the implementation of sustainable development. Agriculture in the sustainable development paradigm is a development system that comprehensively utilizes human resources, natural resources, and technology to improve community welfare (Sidharta et al., 2021). Efforts for sustainable agricultural development can be achieved by carrying out effective and efficient land intensification (Arham et al., 2019).

Continuous development has resulted in many agricultural lands being converted to non-agricultural purposes. High land prices are one of the trigger factors for farmers to relinquish their land ownership investors for conversion. South Sulawesi to experienced land conversion of 105,154.84 ha. This phenomenon shows that the conversion of agricultural land is still high, especially for rice fields in South Sulawesi Province. Moorland or dry land is also used for seasonal crops, including rice, to support increased rice production in paddy fields. Dry land in South Sulawesi is not very wide, only 3,711 ha with a production of 13,483 tons (BPS-Provinsi Sulawesi Selatan, 2019). The socio-economic conditions of farmers are related to the level of welfare of the farmer's family. The main parameters used to determine the level of welfare of farming families are farming income or the social conditions of farming households (Suprianto et al., 2019). For socio-economic conditions in the research area, generally, the main livelihood is as a farmer. Dependence on farming is very large, especially rice farming, to support the needs of the farmer's family.

#### **CONCLUSION AND SUGGESTION**

Based on the results of the study, it can be concluded that rainfed lowland rice farming in Maros Regency and Pangkajene Islands Regency is technically efficient. Rainfed lowland rice farming in Maros Regency and Pangkajene Islands Regency is at risk. Rainfed lowland rice farming in Maros Regency and Pangkajene Islands Regency uses profitability analysis with the approach of NFI, ROI, and BEP to generate income, profit and is feasible.

Farmers need to use production inputs as recommended to increase production reduce production risk and achieve efficient use of inputs. Efforts to reduce risk can be made through technological improvements, namely using varieties that are resistant to pests and diseases, high production, and good adaptability to the plantgrowing environment.

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## Improving MSMEs with digital business-based community empowerment model in Pangandaran region, Indonesia: A system dynamics perspective

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#### **ARTICLE INFO**

#### ABSTRACT

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JEL Classification C26; I26; J15 The creative economy has become Indonesia's new potential after being included in the national development strategic plan. In 2007, creative economy program was started by the Indonesian Agency for Creative Economy and has now merged into the program of Ministry of Tourism and Creative Economy (Kemenparekraf). This study aims to build a digital business-based community empowerment model to improve MSMEs' resilience in the midst of pandemic. A qualitative approach and system dynamics model were used to investigate the handicraft sector in Pangandaran Regency. This study found that MSMEs in Pangandaran Regency still relied on government support. Also, the handicrafts creation was still below the standard and the quantity was not sufficient. Moreover, the business actors still lacked the capital. This condition was exacerbated by the lack of use of digital marketing by craftsmen. Efforts made by the government were intensive assistance. Although it was still quite far from what was expected, the programs implemented by the relevant agencies were quite significant. Even though the penta-helix synergy has been performed to develop MSMEs in Pangandaran Regency, there were some stakeholders that had not optimally implemented their functions.

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#### **INTRODUCTION**

The creative economy is all kinds of industrial sectors that are generated through ideas and have economic value. Human creativity will always change and adapt to the social environment, so the creative economy sector will experience rapid changes. Howkins John in his book entitled The Creative Economy: How People Make Money explained that "the transactions of creative products that have an economic good or service that results from creativity and has economic value" (John, 2013). Creative economy as all types of industries is related to ideas

and money. The Creative Economy Bill explained that the creative economy is the embodiment of added value from an intellectual property right born of human creativity, science, cultural heritage and technology (Creative Economy Outlook Kemenparekraf, 2019). The creative economy in Indonesia was first started in 2007 during the Indonesian Cultural Products Week event. In 2009, the government issued Presidential Instruction No. 6 of 2009 concerning Creative Economy Development. Through this regulation, various creative economy communities and institutions were formed, and later

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they merged under the Ministry of Tourism and Creative Economy. Indonesia categorizes the creative economy into 16 sub-sectors which include game development, architecture, interior design, music, fine arts, product design, fashion, culinary, film, photography, visual communication design, television and radio, crafts, advertising, performing arts, publishing and software application (Strategic Plan Kemenparekraf, 2020). The creative economy has great potential nationally that in 2016 it contributed 7.44% to the national economy, while the value of national GDP exceeded 1,000 trillion in 2017, and increased in 2018 to 1,202 trillion. This figure is supported by the increasing human resources in the creative economy sector. In 2016, there were 16.91 million people working in the sector. This figure increased rapidly by 5.95% compared to the number of workers in 2015 (Creative Economy Outlook Kemenparekraf, 2019).

One area where tourism and creative economy become the leading economic sector of the region is Pangandaran Regency. Pangandaran Regency is an expansion of Ciamis Regency which was established in 2012. With its high natural resources potential, this area places tourism as a leading sector, and the creative economy becomes a supporter of tourism. In the 2011 Government Regulation Number 50 concerning the National Tourism Development Master Plan 2010-2025, Pangandaran Regency is one of the National Tourism Strategic Areas/Kawasan Strategis Pariwisata Nasional (KSPN), supported by tourism, agriculture, creative industries, and trade. Handicraft is the main product of creative economy in Pangandaran Regency. In 2020, there were around 95,000 Micro, Small, and Medium Enterprises (MSMEs) in Pangandaran Regency. This number has massively increased from the previous 5 years, when there were only around 1880 MSMEs existed. The superior potential of handicraft products in Pangandaran Regency includes machetes, angklung, bamboo baskets, and hata plate crafts, among others.

According to Goodwin & Santili (2009), the success of community empowerment is viewed in terms of the benefits obtained by the actors after carrying out the scheduled activities. The implementation of community empowerment programs will not succeed if there is no support from the government, especially businesses that are still developing. The government's presence can be represented through training and intensive assistance. It can also be supported by ratification of regulations such as strategic development plans, allocation of regional budgets and several other policies. The government has access to expand partners through cooperation either between local governments or with the private sector. Thus, if there are efforts from the government and the community, the acceleration of creative economic growth will be easier.

In Pangandaran Regency, there are still many creative economy actors who have not been able to market their handicrafts through online marketplace. In the digital era, the use of social media and marketplaces supports branding and product marketing. If there is training for creative actors in maximizing the function of social media and marketplace, it will greatly support the acceleration of creative economy growth since its potential in Pangandaran Regency is very high. In 2017, Pangandaran's merchants were able to sell their handicrafts in the amount of 1000 pieces/month, but the sales locations were only in certain areas such as Ciamis, Bekasi and Jakarta. Thus, if they are supported by digital marketing, the target market will be much wider.

According to the condition of the creative economy in Pangandaran Regency, the use of digital marketing is necessary to expand marketing networks. In addition, the use of digital marketing is much more effective and efficient, because it uses digital communication tools. According to research conducted by Pane (2014), only 70% of SMEs use social media to market products, while according to Purwidiantoro (2016), SME sales increases by 10-60% after using social media as a branding and marketing tool (Kominfo, 2019). This should be the focus of both local and central governments. The use of digital media, especially social media, is also related to the condition of the internet network. When the internet network is not evenly covered throughout the region, the digital marketing process carried out by creative economy actors is also constrained.

Globalisation and COVID-19 Pandemic changes in conditions can intensify competitive economic behaviour among businesses especially in Pangandaran. While increased business competitiveness may have minimal effects on the business performance of large-sized firms, it can create challenges for MSMEs (Kijkasiwat et al., 2021). One of the things that can be done is to increase production and sales through the Digital Business. This study aims to describe, explain, and analyze the development of community empowerment in the handicraft sector as well as describe and explain a model of developing digital business empowerment business in the handicraft sector in Pangandaran Regency. It is expected that handicrafts can be a superior sector in Pangandaran Regenc.

#### **RESEARCH METHOD**

The study selected Pangandaran Regency as it is known to have several leading economic sectors, one of which is the handicraft products, which still needs more serious handling. This study adopted a qualitative approach with the system dynamics model. System dynamics modeling is an action research approach to studying complex systems, such as families, organizations, and communities (Hirsch et al., 2007). Historically, system dynamics has focused on comparatively tangible processes that have discrete boundaries such as sales and the production of goods, where it is used as a tool in decision making. It has been used to explore problems such as highway congestion (Goodman, 1974; Sterman, 2000), the dynamics of urban growth and decline (Alfeld & Graham, 1976; Forrester, 1969), implementation of innovations (Repenning, 2002), community health status (Homer & Milstein, 2002), human service delivery (Miller et al., 2006), and SMEs growth (Saryazdi & Poursarrajian, 2021; Vojtko et. al., 2019; Winch & Arthur, 2002; Bianchi, 2002).

In this sense, system dynamics has become a broadly applicable school of systems science that emphasizes both a system's behavior and the feedback mechanisms that are assumed to underlie a system's behavioral patterns. By policy actions, system dynamics model refers to the operational policies and actions that individuals and groups use to attain goals. Finally, derived insights into the consequences of various policy actions initiates real-world change efforts. This seemingly simple effort reflects a highly refined set of methodological procedures and very different way of thinking about model building than most psychologists are trained to do (Hirsch et al., 2007). This modeling is used as a tool in making a decision (Figure 1).

Figure 1 shows that the steps of dynamic system modeling begin with identifying and defining problem boundaries. Furthermore, an understanding of the system to be modeled is outlined in a concept. At this stage, the researcher begins by identifying all the important components that will be included in the modeling and setting the model boundaries. The third stage is model formulation, where the researcher formulates the true meaning of each relationship in the conceptual model. After the formulation phase is complete, the designed model must be simulated, usually displayed in the form of a table and the variables of each variable. Then the model is analyzed to determine the level of validity or accuracy. When the results are valid, the model can be implemented. Data collection techniques used are observation, interviews, and documentation.



Figure 1. Dynamic system modeling (Richardson & Pugh, 1981)



Figure 2. System dynamic model work (Soesilo, 2019)

Interviews were used as data collection technique to increase information originating from responses. In this study, researchers conducted direct interviews in the field to observe how was the empowerment of the Pasa community sector in the Pangandaran Regency. The interviewees were handler, hand craftsmen, and local government in Pangandaran Regency. Data analysis and problem solving in this study used the workings of the dynamic system model according to Soesilo (2019).

The model in Figure 2 was interpreted into how the dynamic system works starting with problem structuring which consists of identifying problems in Pangandaran Regency and collecting data. After the structuring problem was finished, the researchers began to do dynamic modelling. At this stage the researchers made a system mapping, defined the type of variables and made a stock flow diagram, simulated the model, recreated the model behaviour reference, validated, conducted sensitivity analysis, designed and analyzed policies, and made strategies and trials. After all of those steps were done, researcher made a causal loop modelling.

Causal loop modelling consists of identifying the main variables, preparing behavior over time (BOT) diagrams, making causal loop diagrams (CLD), analyzing loop behaviour over time, identifying systems, identifying coefficients to leverage, and making strategies through intervention. The fourth step was scenario planning and modelling. Researchers planned general scenarios, identified key variables and uncertainties, built learning scenarios, simulated scenarios with models, and evaluated policies and strategies. The last step in the analysis technique using this dynamic system was implementation and organization learning. At this stage, researchers prepared reports and presentations to stakeholders, built a learning lab based on simulations, and used the learning lab to find out mental models and facilitate learning in organizations.

#### **RESULT AND DISCUSSION**

#### **Existing Condition of Handicraft Economy**

Handicrafts in Pangandaran district have the potential to be developed into a creative economy, although the existing potential for handicrafts has not become a leading sector because Pangandaran district is a new autonomous region as a result of regional expansion. Making handicrafts a leading sector takes longer than nine years. At least a local regulation is needed to manage handicrafts in Pangandaran district.

In 2020 there was 95,000 micro, small and medium handicrafts enterprises in Pangandaran. This number is a massive increase from a total of 1880 micro, small and medium enterprises (MSMEs) in 2015. It shows that people in Pangandaran district are interested in opening MSMEs for handicrafts, due to the abundance of materials that can be processed into handicrafts. At least the most potential handicrafts in each sub-district are machetes, angklung, bamboo baskets, hata plates, and broomsticks. The different handicraft products are caused by the interests and expertise of each craftsman.

Efforts to develop handicrafts have been carried out by the Regional Office of Trade and MSME/ Cooperatives (Disdagkop). The development steps take the form of planning for the next five years, coaching for Small and Medium Enterprises, and cooperation with other sectors. Disdagkop aims that for the next five years there should be at least 50 leading MSMEs. The target is based on the goal to make handicrafts the leading sector in Pangandaran district.

The cooperation was carried out by the Disdagkop by issuing circular to hotels, inns, and restaurants in Pangandaran, in which they were invited to help market or promote handicraft products by displaying handicraft products from MSMEs. However, the craftsmen felt that the efforts of Disdagkop were not optimal. Mr. Asep, a representative of craftsmen in Pangandaran district explained that, "the implementation still has a lot of obstacles. Such as display racks, counter guards who have not clearly recorded who is in charge." Mr. Asep hoped that the circular can be properly disseminated. Instead of circulars that are often just an appeal, the craftsmen hoped that there would be local regulations underlying the marketing and promotion efforts.

In addition to planning and cooperation, Disdagkop has conducted training and coaching for MSMEs. Data from Disdagkop shows that the number of MSMEs participating in training and coaching from 2016-2020 tended to increase (Table 1). In 2016 there were only four business owners who participated in training and coaching. That number rose to 10 in 2020. The coaching and training carried out showed an interesting record. Rinda from Disdagkop explained that the coaching and training treatment must be adjusted based on generation. The boomer and millennial generations can participate in coaching and training, while generation Z only needs assistance. Generation Z already understands marketing through social media, operating social media more fluent than the boomer and millennial generation.

Pangandaran MSMEs only need to take care of the Business Identification Number (NIB) as the identity of the business owner. The ease of the permit is based on Government Regulation number 7 of 2021 concerning the Ease, Protection, and Empowerment of Cooperatives and MSMEs. The NIB requirements are expected to make it easier for business owners to obtain business permits. Although licensing requirements tend to be easy, the 2020 data shows that only ten MSMEs have operational permits. This number tends to be small when compared to the total number of MSMEs in Pangandaran.

The development of handicraft potential cannot be separated from capital. There are two main sources of capital for MSMEs. The first source comes from the Regional Revenue and Expenditure Budget (APBD) and the Special Allocation Fund (DAK). The second source comes from bank loans. The local government through the Disdagkop has begun to increase capital for MSMEs. The source of capital from bank loans is in the form of cooperation between MSMEs and the bank. The loan cooperation is considered to be able to help with capital problems. Checks are carried out to see the ability of MSMEs and see the fulfillment of the requirements to get a loan. It is not uncommon for banks to come to offer loans when they see that the MSME applicants have potential.

Business-bank relations are likely to be pivotal to success (Refait-Alexandre & Serve, 2020). Strong relationships between banks and SMEs can reduce a firm's credit constraints and provide intermediation services to support business activities (Mancusi et al., 2018). Detragiache et al. (2000) argued that having relationships with multiple banks (rather than building a relationship with one bank) can reduce liquidity risks and ensure more stable credits.

MSMEs can also diversify service options when they are in contact with different lenders. MSMEs can leverage the different interest rates offered by a number of banks for refinancing to achieve maximum advantage. As an alternative to having more than one bank, which increases costs, sharing information about banks' charges and services between MSMEs enhances each MSME's negotiations with their bank. Many MSMEs leverage additional advantages from business cooperation in terms of bargaining and negotiation power (Kijkasiwat et al., 2021).

Table 1. Performance for Leading MSME Handicrafts in Pangandaran Regency, 2016-2020

Data item	Unit	2016	2017	2018	2019	2020
The number of human resources/Actors of handicraft MSMEs participating in training and coaching related to the development of MSME Handicrafts	people	4	5	5	9	10
The average number of HR/Employees in the handicraft MSME unit in Pangandaran Regency	people	9	7	9	8	8
Number of Handicraft MSMEs in Pangandaran Regency that have obtained operational permits	unit	4	5	5	9	10
Percentage of the Pangandaran Regency MSMEs Office Budget allocated for the development of Handicrafts.	%	n/a	n/a	n/a	4.19	0.22ª
The number of hand-worked MSMEs that have marketed their products through the marketplace	unit	4	5	5	8	9
The number of handicraft MSMEs that have implemented digital branding	unit	4	5	5	8	9

<sup>a</sup>Due to COVID-19, some planned activities had to be cancelled and caused by budget refocusing

Source: Regional Office of Trade and Cooperatives of MSMEs in Pangandaran Regency

The focus of the local government on increasing the amount of capital to MSMEs aims to increase production. In addition, the increase in capital is expected to provide convenience for handicraft business actors. The table shows that the percentage of the budget from Disdagkop in 2019 was 4.19%. That number decreased significantly in 2020 with a percentage of 0.22%. The decline in the percentage was due to budget refocusing to adjust to the COVID-19 pandemic. Several activities that had been planned for MSMEs development were cancelled.

In addition to capital in the form of money, handicraft business owners also need the help of tools, places (production houses), and equipment related to appropriate technology. Appropriate technology was expected by craftsmen to be able to increase the amount of production and solve the problem of lack of human resources even just a little. This problem led to the irregular production schedule of handicraft products. Problems on the production side were experienced by almost all MSMEs in Pangandaran. Businesses only produced based on order, causing the unpreparedness of the product whenever there were orders in large quantities.

One of the handicrafts is the Hata fern craft. The raw material for making Hata bags comes from Pangandaran district. Hata craft began to develop after a training was held in Lombok in 2017. The training was carried out for two weeks. From the training, craftsmen in Pangandaran can make their own Hata bags and tissues. Previously, Pangandaran district only sent raw materials to Lombok.

Good and targeted marketing can increase income and development for handicraft business actors. The COVID-19 pandemic has affected the sales of handicrafts in Pangandaran. Before the pandemic, the marketing of handicraft products was only done in tourist spots. Sales depended upon visitors. However, basing sales only on tourists is also a problem because handicrafts in Pangandaran district do not yet have a characteristic. The craftsman explained that, "Products in Pangandaran do not yet have a characteristic, so MSME owners are like spectators in their own land because they have not been able to meet the needs of tourists to provide typical Pangandaran souvenirs." Handicraft products development can be used by stakeholders as a focus so that Pangandaran district has its own product identity. Lack of handicraft characteristics was due to various factors, from capital problems to the limited number of craftsmen.

The current digital era is important and business owners should understand that marketing can not only be done offline. Marketing can be widely done online, including via social media. Business actors in Pangandaran have started marketing digitally although from a marketing perspective, the results were not significant. MSMEs that have marketed through the marketplace tend to increase from 2016-2020.

#### **Branding and Marketing Strategy**

The development of digital transformation-based creative economy in Pangandaran Regency is carried out with the pentahelix concept. This concept is an amalgamation of all five related elements in unraveling and solving a problem (Chamidah et al., 2020). The elements are related stakeholders which in the context of increasing the capacity of MSMEs in Pangandaran Regency include the government as the holder of political power and formulator of regulations and policies; communities that have social power as the target of programs and development; academics with their knowledge power; investors who care about the socio-economic conditions of the community as capital power, and the role of the media.

In addition, the approach used in describing the development of a digital transformation-based creative economy in Pangandaran Regency uses dynamic system. This approach is part of systems thinking, i.e. a holistic and non-linear perspective on systemic problems (Wheeler & Checkland, 2000). In relation to the development of the creative economy in Pangandaran Regency, it is necessary to map the problems faced by MSMEs as illustrated in the following CLD problem model.

The development of the creative economy for MSMEs in Pangandaran Regency is focused on increasing the capacity of MSMEs. The capacity of MSMEs is always influenced by the problems faced by MSMEs themselves that it is necessary to solve and map the problems to determine the goals and directions of developing MSMEs that are superior and become iconic in Pangandaran Regency.



Figure 3. MSMEs systemic model in Pangandaran Regency (Adapted from Wheeler and Checkland, 2000)

Figure 3 describes that the capacity of MSMEs in Pangandaran Regency is strongly influenced by the presence of the local government (stakeholder assisting) which in this case is represented by the Regional Office of Trade and Cooperatives. The presence of the relevant agencies in this case can increase the capacity of MSMEs (same directions) which are expected through the power base they have in determining regulations and policies in accordance with the desired development direction (political power) (Chamidah et al., 2020).

The capacity of MSMEs in Pangandaran Regency is still well managed and tends to have an impact on other problems within MSMEs. The MSME problem is the quality of the workforce (HR) which is still below the standard so that it affects employee performance (Boselie et al., 2005; Combs et al., 2006). In addition, another issue that is no less important is the cost of living in the district, which tends to be higher than the neighboring autonomous regions. Thus, it later will affect the standard wage system applied in Pangandaran Regency. It should be underlined that in Baniar City, which borders Pangandaran Regency, the cost of living is cheaper, even though it is a municipality. This problem can hinder (opposite) the capacity development of MSMEs in Pangandaran Regency in term of production capacity (Peck & Vannix, 1998).

Another problem related to increasing the capacity of MSMEs in Pangandaran Regency is the need for

business capital, which is not small. Most of the MSME owners in Pangandaran Regency live in middle to lower economic conditions, while small businesses are productive economic businesses that stand alone with limited resources (Kania et al., 2021), run by individuals or legal entities, not subsidiaries or branch of business that is owned by, controlled by, or becomes a part of, either directly or indirectly, a corporate. This kind of obstacle is exacerbated by the poor quality of the data held by the Regional Office of Trade and Cooperatives. There was an increase in the number of MSMEs in Pangandaran Regency when capital assistance programs such as People's Business Credit/Kredit Usaha Rakyat (KUR) and Micro Business User Assistance/Bantuan Pengguna Usaha Mikro (BPUM) were launched. This increase became the highlight of a fairly serious problem because it occurred when BPUM was implemented. In addition, this increase is considered unreasonable when looking at the previous number from 1,880 MSMEs to 9,500 MSMEs, or an increase of around 90% from the previous data.

Although the Regional Office of Trade and Cooperatives is not considered to have enough influence in increasing the capacity of MSMEs in Pangandaran Regency, it is still considered to have a positive (virtuous) impact and support for the capacity of MSMEs. This can be seen from its communication assistance with several well-known e-commerce platforms, i.e., BliBli Indonesia, Tokopedia, etc. Novita et al., Improving MSMEs with digital business-based...

Another positive thing that has been done by the Regional Office of Trade and Cooperatives was to divide the handling and assistance clusters according to the generation of birth (Baby Boomer, X, Millennial and Z) of each registered MSME owner. Although this action did not directly have a significant impact on increasing the capacity of MSMEs in Pangandaran Regency, it is expected to be a supporting factor (leverage) that is useful in achieving development goals and increasing the capacity of MSMEs that are superior, iconic and digital-based in Pangandaran Regency.

The Regional Office of Trade and Cooperatives plays a major role in bringing together investors with potential MSME communities. The Regional Office also functions as a filter and guide for investors who want to invest in MSMEs in Pangandaran Regency. This directive is more about protecting the two stakeholders who work together between the MSME communities as potential development targets and investors that have capital power.

The direct entry of investors into the MSME communities also increases (same directions) capital assistance, which is still small and limited. In addition, it can also reduce the dependency on KUR and BPUM only. The positive benefits of cooperation among the Regional Office of Trade and Cooperatives, the MSME Communities and the investors are also providing knowledge in branding and digital promotion, with training in creating digital content on the YouTube platform. Although, again, this is not done for all MSMEs, but only on selected MSMEs and registered operationally at the Regional Office of Trade and Cooperatives.



Figure 4. Sociogram map of stakeholder roles (Adapted from Granovetter, 2018)

In general, the problem model that has been described has represented the current condition of the synergy among stakeholders related to the development of superior and iconic MSMEs in Pangandaran Regency. Synergy among stakeholders is described through relationships that occur dynamically according to the penta-helix concept used. However, from the description, there are several networks of stakeholder actors who have not been directly or indirectly involved as described in the following sociogram.

The visualization of the sociogram (Figure 4) explains the penta-helix synergy among stakeholders related to the development of MSMEs in Pangandaran Regency. By using a network analysis of actors and a degree out point of view (Granovetter, 2018), it is known that there were 6 stakeholders in the pentahelix concept of MSMEs development in Pangandaran Regency, which consisted of: (i) Regional Office of Commerce; (ii) Investors; (iii) MSME Communities; (iv) Society or labor force; (v) Academician, and; (vi) Media. Of the six actors, the relationship to each actor was mostly owned by the Regional Office of Trade and Cooperatives with 4 relationships. Then there were the MSME communities and investors with 3 relationships each. Lastly, there was Society with 2 relations. The other 2 actors, media and academia, did not have any relationship with the four interrelated actors above.

The results of the network analysis described above show that the penta-helix synergy used in Pangandaran Regency to develop MSMEs has been running. However, there were some stakeholders who still did not optimally implement their functions. The academia as the actor of knowledge power had not functioned. They should have a large share in economic development in an area, especially in the context of empowerment and capacity building for MSMEs (Margolang, 2018). The last one is the media. In the context of developing MSMEs in Pangandaran Regency, media seemed to not have any involvement at all, even though it is a means of leads businesses to be more interactive in marketing communications and to find innovative applications to make products and brands more affordable through online marketing efforts via social media communication channels. These practices, which express social media marketing activities, include actions that encourage consumers to choose products and brands and that target marketing messages to other consumers online (Bilgin, 2018).

The effect of social media on consumer's behavior includes a wide spectrum of activities ranging from informing, sharing ideas and attitudes to acquire awareness and understanding, and visualize postpurchase behavior without purchasing (Tatar & Erdoğmuş, 2016). This leads businesses to be more interactive in marketing communications and to find innovative applications to make products and brands more affordable through online marketing efforts via social media communication channels. These practices, which express social media marketing activities, include actions that encourage consumers to choose products and brands and that target marketing messages to other consumers online. Research has shown that social media influences the intention of trust and purchasing and facilitates sharing of knowledge and experience among consumers (Lu & Hsiao, 2010; Hajli, 2014). Many businesses use online interactions among their users by encouraging their customers to share their purchases (So et al., 2018) with simple clicks using their chosen social media channel.

#### **CONCLUSION AND SUGGESTION**

This study contributes to the literature on strategic digital business-based community empowerment models to improve the performance and production of handicraft MSMEs in Pangandaran Regency by drawing a system dynamics perspective that can be built in the area. This is motivated by the creative potential of the said product, which has not received much attention. For this reason, supports from various stakeholders such as government, community, academia, businessmen, and media are very much needed.

Most of the MSMEs in Pangandaran Regency have problems with shortage of labor and unpreparedness in producing handicrafts in a large scale. The government has conducted training for business owners as an effort to increase human resources and digitize products. Other problems related to increasing the capacity of MSMEs in Pangandaran Regency is the lacking business capital which makes production possible only by order and the lack of characteristics possessed by the said handicrafts.

Pangandaran Regency Government is aware of this so they put out such efforts as empowerment programs in the form of production training. However, people of Pangandaran Regency do not just need training in creating products, but also in making them appealing for the consumers and in marketing them nationally and even abroad.

Also, the Pangandaran Regency Cooperative and MSME Development Service is expected to establish cooperation with e-commerce such as Tokopedia, BliBli, and so on. Currently, MSMEs in Pangandaran Regency have entered the digital market, although it is still not significant. The results of the study showed that from 2016 to 2020, the number of superior handicraft MSMEs that have implemented digital brands has increased. Despite experiencing a significant increase in digital branding, it is still necessary to increase the marketing of handicraft MSMEs in Pangandaran Regency.

In term of the development and empowerment of Handicraft SMEs in Pangandaran Regency, several things can be done. First, there has to be special attention to standard regulations such as the Regent's Regulation which aims to promote and market handicrafts in Pangandaran Regency in places that are often visited such as hotels, restaurants, and several strategic tourist spots. Secondly, there needs to be strict provisions for every stakeholder in marketing the products of MSME handicrafts, as well as socialization, training, and assistance to handicraft MSME owners in the use of technology that can improve digital marketing.

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# Smallholding farmers wellbeing in ecosystem services area of high food provider in border area of Indonesia

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#### ABSTRACT

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The utilization of wetland areas poses a threat to the wetland ecosystems's vitality. The Kayan Sembakung Delta in North Kalimantan Province is one of the wetland ecosystems that is widely used by humans for various activities, raising concenrs about its sustainability. This study aims to assess the area's carrying capacity and environmental capacity as well as the level of welfare of small farmers. The research was conducted in March-June 2020 in Tanjung Buka Village, Tanjung Palas Tengah District, Bulungan Regency, which is part of the Kayan Sembakung Delta area. The study employed an analysis of the carrying capacity of the environment as well as an analysis of the poverty and welfare assessment of farmer households using the Nested Sphere of Poverty (NESP) approach. The results showed that Tanjung Buka Village has an area with a high carrying capacity and environmental capacity as a food provider covering an area of 61,352.12 ha. Small farmers experience subjective and objective welfare in the moderate category. Increasing the welfare of small-scale farmers can be done through efforts such as repairing houses below proper standards, meeting food needs, increasing consumption of protein (meat, eggs, fish), providing clean water, diversifying income sources, ease of access to food. sources of employment, promoting conservation of wood and plant species, securing land tenure, complying with local regulations, and improving infrastructure.

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#### **INTRODUCTION**

There is a strong correlation between the use and utilization of natural resources, the quantity and quality of life environment, and the carrying capacity of life environment. Knowing the carrying capacity of life environment in a certain area is very strategic issue. Why is that? Understanding the carrying capacity of life environment in a specific area is equivalent to undertanding the capacity of environment to support the life of human and other living creatures, balance between them, and also t understanding the capacity of the environment to absorb energy and/or other substances included within the energy. Therefore, understanding the supporting capacity of the living environment is the initial step toward the better quality and quantity of life environment (Zhang et al., 2022). In this research, the carrying capacity of life environment of an area is estimated using an approach called "Ecosystem Services". According to (Sutrisno et al., 2022), the carrying capacity of life environment can be measured by ecosystem services. This approach assumes that high performance of ecosystem services leads to high supporting capacity of life environment (Tougeron et al., 2016).

On the other hand, Johansen et al. (2012) explained that the carrying capacity of life environment of an area is determined by human activity in that area. The activity of smallholding farmers can increase the capacity of food provisioning but also have negative impact by degrading environmental carrying capacity. Conversely, environmental condition may affect farmers condition. Therefore, understanding the condition of smallholding farmers well-being in area with ecosystem services as high food provider is significant. The Poverty and wellbeing of smallholding farmers are understood through multidimensional concept. this research uses the model of Nested Spheres of Poverty (NESP) (Wahyuni et al., 2023). Under NESP model, poverty and wellbeing comprise various environments, or in other words, different daily lives. Central environment in this model is subjective wellbeing. Core environment that influences subjective wellbeing is health, material wealth, and knowledge. These three environments are indirectly affected by contextual environment which in the other hand directly influences subjective wellbeing. In this matter, environment consists contextual of natural, economical, social and political aspects (spheres) of the life that directly or indirectly influence core environment. Otherwise, the contextual environment is affected by infrastructure and services (Talukdar & Banthia, 2013). The illustration of NESP model is presented in Figure 1.



Figure 1. NESP Model (Sutrisno et al., 2022)

By understanding the condition of poverty and wellbeing among smallholding farmers in the area where ecosystem services as high food provider, it becomes possible to identify the challenges faced by these farmers. In line with this perspective, the primary problem addressed in this research is how to improve smallholding farmers in the area where the capacity of ecosystem to provide is high. Meanwhile, the research intends to pinpoint areas with a high supporting capacity as high food provider, comprehend the wellbeing of smallholding farmers in this areasand formulate recommendations on improving the conditions of smallholding farmers in locations with a high capacity for food provision. The research was conducted in Tanjung Buka Village in the administrative of Bulungan Regency, North Kalimantan Province.

#### **RESEARCH METHOD**

This research was conducted in Tanjung Buka Village, located within the administrative area of Bulungan Regency, North Kalimantan Province, based on considerations related to the high level of mangrove forest utilization activity in the village. Tanjung Buka Village has an area of 199.45 Km2. According to village data, the population is reported to be 4,056 people residing in 1,047 households. Respondents or people serving as sources of information in this research were selected as household units, following the guidelines outlined by (Groves et al., 2011) when the population exceeds 100 then researchers can choose 10% to 20% of the total population as sample respondents. In this study 104 households were selected as respondents. the selection process involved a lottery, with efforts to ensure an even distribution.

The materials and instruments used in this research consisted of: (i) Ecoregion (landscape) map; (ii) Land use category map; (iii) Slope map; (iv) Computer hardware and software for processing data and information from Geographic Information Systems (GIS). Such software includes ArcGIS, QGIS, MapSource and Global Mapper; Field (v) documentation instruments for verifying maps and field conditions; (vi) Questionnaire assessing the welfare of small farmers; and (vii) Writing and recording equipment.

Data analysis to determine the level of environmental carrying capacity is completed using an

ecosystem services approach, which focuses on the benefits that humans obtain directly or indirectly from ecosystem functions (Villamagna et al., 2013). The outline of this analysis is illustrated in Figure 2.

Environmental carrying capacity data for ecosystem services is based on spatial data, including the following sources: (i) land scape map, at information scale of 1:250,000, acquired in 2016, provided by the Directorate for Environmental Impact Prevention of Sectoral and Regional Policies and the Directorate General for Forestry Planning and Environmental Governance, both under the Ministry of Environment and Forestry; (ii) A vegetation type map at an information scale of 1:250,000, acquired in 2016, provided by the Directorate for Environmental Impact Prevention of Sectoral and Regional Policies and the Directorate General for Forestry Planning and Environmental Governance, both under the Ministry of Environment and Forestry; (iii) A land cover map, at an information scale of 1:25,000, provided by the

Office of Public Works; (iv) A System Grid Map, at size of 5"x5", acquired in 2016, provided by the Directorate for Environmental Impact Prevention of Sectoral and Regional Policies and the Directorate General for Forestry Planning and Environmental Governance, both under the Ministry of Environment and Forestry; (v) An administrative boundary map at information scale of 1:25,000; (vi) A road network map at information scale of 1:25,000. Meanwhile, data regarding smallholding farmers wellbeing encompass various dimensions: (i) Nutrient and health; (ii) Knowledge; (iii) Material; (iv) Economic sphere; (v) Social sphere; (vi) Natural sphere; (vii) Political sphere; (viii) Infrastructure services; and (9) Subjective wellbeing.

People wellbeing index and poverty status are comprehended through variables and indicators utilizing NESP approach. The Variables and indicators of this index are outlined by (Wahyuni et al., 2023) as shown in the Table 1.



Figure 2. Environmental carrying capacity mapping framework

Variable		Indicator
Nutrient and	1.	Serious illness
health	2.	Medical services
	3.	Medical check up on pregnant mothers
	4.	Help for laboring mothers
	5.	Fulfillment of needs
	6.	Consumption of meats/eags/fish/chickens
	7.	Sources of drink water
Knowledge	8.	Education level
<b>5</b> -	9.	Children in 7-18 year of age who attend school
	10.	Illiteracy
	11.	Incapable of Indonesian language
	12.	Skills outside of farming and fishery
	13.	Access to information
Material	14.	Physical condition of the house
	15	Cloth nossession for daily activity and special event
	16	Household equipment (motorcycle TV refrigerator chainsaw and internal toilet)
	17	Flectricity
	18	Cooking fuel
	19	Wellbeing of household compared to another
	20	Condition of household in the future
Economic sphere	20.	Difficulty in purchasing refined sugar (the last 12 months)
Leonomic sphere	21.	Source of income
	22.	a Number of source of income
	25.	h Source of fixed income
	74	Onporte of fixed model
	24.	Capability of making savings (the last 12 months)
	25.	Possession of irrigated land/ non-irrigated land/ garden
Political cohore	20.	Desticination (representation in village decision making
	27. 20	Assurance of land evenessing in village
	20.	
Cocial cabora	29.	Implementation of local rules
Social sphere	20. 21	Land dispute/other connect
	21. 22	House level anitoling the Village semural work
	32. 22	Rousehold participation in Windge Conditial Work
	ວວ. ວ⊿	Friendship of children with other children from different religion
Natural anhoro	24.	
Natural sphere	35.	Current condution of the nature
	30.	Floody landslide/lofest life/ pest attack (the last 12 months)
	3/.	Water quality of river, lake and water source
	38.	Existence of Bekantan Monkey, Enggang Bird, Pygmy Elephant
	39.	Number of wood and vegetation in the forest
T	40.	
Infrastructur	41.	Access toward the nearby junior high school
services	42.	Activity of learning and teaching at school
	43.	Health services frequently used by community
	44.	Condition of road/bridge
	45.	Iraining, counseling, course and mentoring on business (the last 12 months)
	46.	Implementation of development program initiated by Regency Government (the last 1 year)
	47.	Implementation of village development program (the last 5 years)
Subjective	48.	Feeling of wellbeing
wellbeing	49.	Feeling of poverty
	50.	Feeling of happiness

Table 1. Variables and Indicators of People Wellbeing Index

After completing data collection based on the mentioned indicators, nine fundamental indices are calculated, including subjective well-being, material wealth, Health, Education, economic environment, natural environment, Political environment.

The index value can be calculated using the following formula:

$$IV = \frac{SO - SMi}{SMa - SMi} \times 100$$

In which IV is value index, SO is number of scores obtained, SMi is minimum number of scores, and SMa is maximum number of scores. Furthermore, determining the classification of each person/village is determined as follows: (i) critical = 0 - 45, (ii) medium = 46 - 54, (iii) good = 55 - 100.

#### **RESULT AND DISCUSSION**

#### **Characteristic of Respondent**

This research explores the sociodemographic characteristics of 104 households in Tanjung Buka Village, Tanjung Palas Tengah District, Bulungan Regency, providing essential insights into the dynamics of small farmers in the Kayan Sembakung Delta region. These characteristics provide various aspects, including gender distribution, age demographics, education level, and more.

Achieving gender balance is critical, as previous research underscores the significant impact of women's participation in agriculture on food security and overall household well-being. 55% of respondents are adult men.

Assessing the age structure of respondents is critical for understanding generational dynamics in farming communities. This highlights the involvement of the younger generation and the potential influence of older farmers on agricultural practices. There are 61 farmers aged 30-45 years, and 43 farmers aged over 45-65 years.

Respondents' educational characteristics play an important role in determining people's adaptability to modern agricultural practices and their understanding of sustainable agriculture. Higher levels of education often correlate with increased participation in development initiatives. 104 farmers have a maximum education at junior high school level.

Identifying respondents' main occupation provides an idea of the diversification of livelihoods in society. If the majority of respondents depend on agriculture as their primary livelihood, this information can provide the design of sustainable agricultural development programs that meet the specific needs of these households.

Characteristics such as land ownership, ownership of agricultural equipment, and access to resources provide insight into a community's ability to manage available resources effectively. Most farmers have their own land for agricultural activities.

Exploring respondents' experiences and length of involvement in agriculture adds a historical perspective. Long-term involvement in agriculture can shape people's approaches to agricultural practices and influence their responses to development interventions. All respondents had personal experience or additional skills in the agricultural sector for more than 5 years.

#### **Environmental Carrying Capacity**

According to the results of identification, field observations, assessment and weighting, this research found that Tanjung Buka Village has 2 types of landscape, 3 types of natural vegetation and 11 types of land cover. The scores and weights of ecosystem services in food supply are presented in Table 2.

Landscape	Score as Food Provider	Weight	Vegetation Type	Score as Food Provider	Weight	Land Cover	Score as Food Provider	Weight
Kalimantan fluvial land	3	0.28	Beach vegetation	3	0.12	Primary mangrove forest	4	0.6
Kalimantan coastal land	3		Mangrove vegetation	2		Secondary mangrove forest	4	
			Herbal vegetation at the bank of brackish river	3		Secondary swamp forest	3	
						Open land	1	
						Plantation/ garden	2	
						Settlement/ built- up land	1	
						Dry land farming with bushes	3	
						Swamp	3	
						Swamp shrubs	3	
						Embankment	5	
						Water body	5	

Table 2. Score and Weight of Landscape, Vegetation Type, and Land Cover as Food Provider

As indicated by the contents of Table 2, the value of ecosystem services is determined from the score and weight of ecosystem services, referring to landscape, natural vegetation, and land cover in research location. For example, Kalimantan fluvial land that has beach vegetation with land cover of mangrove or secondary mangrove forest (after deforestation) is predicted to have high value of ecosystem service.

The value of ecosystem services is crucial in maintain environmental sustainability and diversity. Ecosystem services can cover a number of benefits, such as providing clean water, flood control, carbon sequestration, and habitat for various species. In this case, the scores and weights of ecosystem services are the key to determining the value of these ecosystem services. For example, in the context of fluvial lands in Kalimantan, coastal vegetation represented by mangrove forests or postdeforestation secondary mangrove forests can make a significant contribution to the value of ecosystem services. Mangrove forests play a vital role in sustaining of coastal ecosystems by acting as a natural fortress that protects the land from erosion caused by sea waves and storms (Winterwerp et al., 2020), (Kathiresan, 2021). Additionally, mangroves serve as a biodiversity buffer by providing a habitat for many unique species, including birds, fish and reptiles. Land cover in the form of mangrove forests on Kalimantan fluvial land also benefits for local communities economically providing resources such as firewood, construction timber, and other non-timber products like agarwood and mangrove crabs. These results can be sold or used on a subsistence basis, contributing to the livelihood of local communities reliant on the mangrove ecosystem. Akram et al. (2023) explained that securing and maintaining land cover in the form of mangrove forests on Kalimantan's fluvial land is important to ensure the survival of ecosystem services that provide sustainable social, economic and environmental benefits.

In determining the value of ecosystem services, scores and weights of ecosystem services play a crucial role (Nellemann & Corcoran, 2010). The ecosystem service score describes the sustainability and quality of ecosystem services at a research location. This score encompasses various factors, including biodiversity, ecosystem productivity and water availability. The higher the ecosystem service score, the more valuable the ecosystem's contribution to human well-being (Villamagna et al., 2013).

Ecosystem service weights, on the other hand, place emphasis on the importance of each type of ecosystem service in the context of the study. This weight can be assigned based on preferences and priorities set by stakeholders, such as local communities, policy makers and scientists. For example, if the study area has rich natural vegetation with high biodiversity, the weight of ecosystem services for biodiversity could be increased to reflect its importance.Landscape use is also an important consideration in determining the value of ecosystem services. Natural and intact landscapes tend to provide more diverse and valuable ecosystem services than degraded landscapes (Anderson et al., 2017). Therefore, landscape fragmentation, land cover, and habitat quality are important determinants in evaluating ecosystems services. By considering the scores and weights of ecosystem services, research on the value of ecosystem services can provide valuable insights in managing and protecting the environment (de Jong & van Zanten, 2011). This information can be used to inform environmental policy, guide decisions about sustainable land use, and promote preserving and restoring valuable ecosystems. Through a better understanding of the value of ecosystem services, research contributes to ensuring environmental sustainability and human well-being can be balanced in the future (Butler & Oluoch-Kosura, 2006).

Table 3. The value of  $I_{ecc}$  by Category of Ecosystem Service as Food Provider

			$I_{\text{ecc}}$ as	Category of
Wls x Sls	$W_{veg} \times S_{veg}$	$W_{lc} \times S_{lc}$	Food	Supporting
			Provider	Capacity
0.28 x 3	0.12 x 4	0.60 x 1	1.92	Low
0.28 x 2	0.12 x 5	0.60 x 2	2.36	
0.28 x 5	0.12 x 3	0.60 x 2	2.96	Moderate
0.28 x 3	0.12 x 4	0.60 x 3	3.12	
0.28 x 2	0.12 x 5	0.60 x 4	3.56	High
0.28 x 3	0.12 x 4	0.60 x 4	3.72	
0.28 x 5	0.12 x 3	0.60 x 4	4.16	
0.28 x 3	0.12 x 4	0.60 x 5	4.32	Very High
0.28 x 5	0.12 x 3	0.60 x 5	4.76	

The value of  $I_{ecc}$  as Food Provider is ranging from 1.92 to 4.76 (Table 3). This range of  $I_{ecc}$  values indicates that environmental supporting capacity of the area as food provider varies from low ( $I_{ecc}$  1.92 –

In addition, the value of  $I_{ecc}$  as food provider in high category is varying from 4.32 to 4.76. This range of values indicates that many combinations of landscape, vegetation type, and land cover result in high and low ecosystem services in food provisioning. For instance, the combination of the landscape of Kalimantan fluvial land and vegetation of herbs at the bank of brackish river, with land cover of primary mangrove forest, has produced an ecosystem service with capacity as high food provider.

Furthermore, the  $I_{ecc}$  values are inputted into the map of environmental supporting capacity based on ecosystem services. This map is depicted in Figure 3.

In relation to the map above, polygon width of each environmental carrying capacity is calculated and compared to the interval of  $I_{ecc}$  values (in ha unit). The result of calculation is displayed in Table 4.

The Table 4 shows that Tanjung Buka Village as food provider is dominated by the area with environmental supporting capacity in very high category ( $I_{ecc}$  4.32– 4.76) and the width of this area is 71,763.74 ha. This area refers to the landscape of Kalimantan fluvial land with vegetation type of herbs

at the bank of brackish river and with land cover of primary mangrove forest and edam.

Table 4.	Environmental Supporting Capacity of High
	Food Provider in Tanjung Buka Village

Supporting capacity category	Interval Score	$\mathrm{I}_{\text{ecc}}$ Value
		ha
Very High	4.32-4.76	71,763.74
High	3.56-4.16	61,352.12
Moderate	2.96-3.12	11,435.46
Low	1.92-2.36	15,763.71

Regarding the finding above, environmental support capacity of Tanjung Buka Village in food provisioning is considered high. The reason behind this is that the area of Tanjung Buka Village is generally comprises landscape involving Kalimantan fluvial land and Kalimantan coastal land with vegetation type consisting of herbs at the bank of brackish river, beach vegetation, and mangrove vegetation. Such vegetations has made the area abundant of food sources, providing carbohydrate and protein, such as meats, fish, fruits, vegetables with leaf, beans and cereals. All these food sources are also rich of phytochemicals, micro nutrient substance, and simple sugar.



Figure 3. Map of environmental supporting capacity from the ecosystem service of high food provider in Tanjung Buka Village

The area with a very high environmental carrying capacity in Tanjung Buka Village supports various species of freshwater and marine fish, which play an important role in providing a source of protein for the local community. The diversity of plants in Kalimantan's fluvial soil and primary mangrove forest in Tanjung Buka Village produces various green leafy vegetables rich in fiber, vitamins and minerals, such as spinach, kale and cassava leaves. According to research by (Wahyuni, 2021), coastal plants that thrive in the Kalimantan area around the Kayan Delta generally produce fruits rich in vitamin C and antioxidants, such as mangoes, rambutans and bananas, which are sources of carbohydrates and important nutrients for locals. The results of research by (Wahyuni et al., 2022) show that the Tanggul area in Tanjung Buka Village has a variety of legumes, such as peanuts and green beans, which are rich in vegetable protein and fiber which are good for digestive health.

#### **Smallholding Farmers Wellbeing**

In a family or household, there is someone who acts as the head responsible for the entire family and plays a role in making decisions regarding family life. According to the survey results at the study location, it was noted that as many as 96.4% of households had male heads of families, generally husbands (Table 5). The average number of family members in a household is 4. In general, each household is

inhabited by only one family. Furthermore, the average percentage of males aged <17 years was 62.0% of all selected households, indicating a relatively high number of productive-age men in the village. Additionally, the percentage of women living in the household is 46.7%.

Table 5. Sociodemography of Smallholding Farmers

Sociodemography	Unit	Value
Male Head of Family	%	96.4
Average Family Size		4
Average Family amount		1
Population under 17 years old	%	62
Number of women in the household	%	46.7

The largest ethnicity in the research area is the Bugis tribe, consisting 60% of the population. The second largest population is the Javanese ethnic group, accounting for 18%, followed by the Tidung ethnic group at 14%. This demographic distribution is influenced by the dominance of fishing villages and pond farmers in the research location. People of Bugis and Tidung ethnicity manly carry out the professions of fishermen and pond farmers, as traditionally, the life and work of these two ethnic groups are associated with seafaring. The relatively large presence of the Javanese ethnic group is due to the research location (Tanjung Buka) being a transmigration area from Central Java and parts of East Java.



Figure 4. Area with ecosystem services of high food provider as the location of farming work by smallholding farmers



Figure 5. Distribution of smallholding farmers based on their wellbeing level in each living aspect



Figure 6. Model of smallholding farmer wellbeing at the area of high food provider based on NESP approach

Smallholding farmer wellbeing at the area of high food provider (Figure 5 and 6) is assessed using the NESP model. This model describes subjective and objective wellbeing influenced by various aspects of daily life such as personal feeling, material possession, health, knowledge, economical environment, natural environment, political environment, social environment, and structure and services.

Based on the Figure 5 and 6, the current research confirms that small farmers in high food supply areas in Tanjung Buka Village, Bulungan Regency tend to have a level of welfare in the medium category. Indeed, smallholders' subjective feelings about their well-being in the moderate category are influenced by the core environment (material possessions, health), contextual environment (natural environment, economic environment), and external environment (structure & services) which are also in the moderate category. The medium category shows that farmers
have not achieved a good level of welfare, especially in the aspects of material ownership, health, protection of natural sustainability as a food source, community livelihood conditions, community structure and services so that efforts are still needed to improve the conditions of high welfare category (good).

Despite these findings, the core and the contextual environment of smallholder farmers in this area are in good condition, particularly in the social and knowledge/educational aspects, there is high awareness in the community regarding the importance of education, as evidenced by sending children to school and ensuring equal treatment in education for both boys and girls. Equality in education is also applied in non-formal education such as the involving women in counseling and outreach activities, especially related to livelihood activities.

The only contextual environment that influences objective well-being in the low category, i.e. critical, is the political environment. The critical category shows that the political environment of respondents related to representation or involvement in village decisionmaking, certainty of land tenure in the village, and the application of local regulations is still low, requiring intervention to encourage changes in the political environment.

Furthermore, Figure 5 and 6 confirm that small farmers in the high food supply area in Tanjung Buka Village, tend to have a level of welfare in the medium category. This study is supported by previous research highlighting the relationship between the condition of small farmers and their level of welfare. A study by Zhang et al. (2022) shows that smallholder farmers often describe their welfare level as moderate, reflected in their subjective perception of material possessions and health factors. This study also highlights the importance of environmental factors in influencing the welfare of smallholder farmers, with the smallholder environment consisting of three main aspects: the core environment, the contextual environment, and the external environment. The core environment includes material ownership and smallholder health. According to Sutrisno et al. (2022), the core environment of smallholder farmers in the village is categorized as good, meaning that these factors are relatively fulfilled and contribute to a better level of welfare.

The contextual environment includes both the natural environment and the economic environment

that affect smallholders. The aspect of the contextual environment that has a significant negative effect on the objective welfare of small farmers is the political environment. Research by Wahyuni et al. (2022) highlighted that the political environment in the northern Kalimantan border area is categorized as low or critical. Political instability and unfavorable policies can pressure smallholders and affect their overall wellbeing. Overall, this study confirms that smallholder farmers in Tanjung Buka Village, have a level of welfare in the medium category. The core and the contextual environment of smallholder farmers in this area are mostly in good condition, but the political environment is a significant factor influencing their objective well-being. Therefore, special attention is needed to develop a more stable and favorable political environment for small farmers to improve their welfare.

Table 6 indicates that improving the quality of housing is a crucial step in improving the welfare of small farmers. By repairing houses that are not suitable for use, small farmers can acquire a safe and comfortable living place, leading to an overall improvement in family welfare (Meroni, 2007). This aspects holds significant importance in the efforts to improve the welfare of small farmers in Tanjung Buka Village. Inadequate housing, characterized by uninhabitable, or insufficiency, damage, can considerably burden smallholder farmers and their families. Through the housing improvement program, small farmers can access safe and comfortable living place, contributing to an enhanced quality of life (Deelstra & Girardet, 2000). Home improvement may involve renovations, reconstructions, or the addition of essential amenities, such as proper sanitation systems, clean water, sufficient ventilation, and adequate lighting. In addition, sustainability and aspects, enerav efficiencv such as usina environmentally friendly building materials and renewable energy sources (Omer, 2008). This should be considered to minimize adverse environmental impacts and optimize resource use. Decent housing provides safety, comfort, and protection against environmental risks and natural disasters, fostering privacy and adequate space for a healthy family life. Moreover, home improvement can positively impact the economy.

Objective Wellbeing		Efforts To Improve Wellbeing
Core Environment	Material Possession	Repairing inexpedient houses
		Making available of cooking fuels
	Health/	Fulfilling the food needs
	Nutrient	Serving protein consumption (meat, egg, fish)
		Supplying clean water
Contextual Environment	Economic	Increasing income source diversity
		Facilitating the seek for livelihood (job)
		Increasing ability to save money
		Ensuring the adequacy of garden/plant field
	Nature	Conserving endemic animals
		Conserving wood and plant species
	Political Environment	Getting involved in the politics
		Assuring land possession
		Implementing local regulations
Infrastructure	Structure and	Repairing roads and bridges
Environment	Services	Organizing counseling/training/courses/mentoring for entrepreneurship
		Implementing development program/activity

Table 6. Improvement of Objective Wellbeing of Smallholding Farmers in Tanjung Buka Village

Access to safe and affordable fuel is an important factor the welfare of small farmers (Talukdar & Banthia, 2013). The use of efficient and environmentally friendly fuels should also be considered. In Tanjung Buka Village, ensuring access to safe, affordable, efficient and environmentally friendly fuel is crucial for improving the welfare of small farmers in Tanjung Buka Village. Fuel is essential for cooking, heating and meeting daily energy needs. Limited access to adequate fuel can impede the productivity of smallholder farmers, emphasizing the importance of considering sustainability and energy efficiency when selecting fuels. Efficient fuel use helps smallholder farmers save on energy costs and reduce the negative impact on the environment. Exploring alternatives such as energy-efficient stoves or renewable energy-based cooking technologies (for example, biogas or biomass), can be valuable.

Efforts to ensure adequate and quality food availability for small farmers deserves attention. A sustainable agricultural approach, includina diversification of food crops, can contribute to increase food availability at the household level (Tambunan, 2015). Ensuring adequate protein consumption, such as meat, eggs and fish, is important for meeting the nutritional needs of small farmers. Diversification of food crops is one approach that can be used to increase food availability (Wahyuni et al., 2022). Diversifying food crops allow small farmers to access a more varied and nutritious range of foods while reducing vulnerability to weather disturbances, pests and plant diseases that can impact crop yields (Legesse & Drake, 2005). Alongside sufficient food availability, attention to adequate protein consumption including meat, eggs, and fish, is crucial. Protein is an important nutrient in meeting nutritional needs and promoting growth. Sustainable agricultural approaches, such as using organic fertilizers, efficient water management, and soil conservation, contribute to sustainable food production and environmental protection (Ferris et al., 2014).

Developing smallholder economy а (socioeconomic), diversifying income sources is critical to reducing risks and improve welfare Increased access to non-agricultural employment opportunities can enhance the welfare of small farmers. Inclusive financial programs, encompassing financial literacy and access to financial institutions, support long-term programs to improve farmer welfare (Raza et al., 2023). When smallholders have better access to offfarm employment opportunities, they have opportunities to diversify their incomes. Farmers can look for additional work or start side businesses in other sectors that can provide additional income. In addition, inclusive financial programs also have an important role in improving the welfare of small farmers, with adequate financial literacy, farmers can understand how to manage their finances more effectively (Tambunan, 2015). They can learn about saving management, investing, and financial risk management, all of which can help them increase their financial stability. Access to financial institutions such as banks, cooperatives or microfinance institutions is also important for smallholders. Through this access, they can obtain capital loans to expand their farming business, purchase better equipment or seeds, and develop more efficient farming practices. Smallholder participation in local political processes can influence policies that support improving their welfare.

By being actively involved in local political forums, such as village government meetings or farmer advocacy groups, small farmers can voice their problems and needs (James & Sulemana, 2014). Smallholders can influence policy-making relevant to the agricultural sector and their well-being through political participation. Farmers can propose concrete solutions, provide input to policy makers, and collaborate with related parties to achieve common goals. In addition, smallholder political participation can help raise awareness among policy makers about the challenges smallholders face (Legesse & Drake, 2005).

Good infrastructure, such as roads and bridges, is vital in smallholder accessibility and connectivity with markets and other services. Good infrastructure, such as roads and bridges, is essential for smallholder accessibility and connectivity with markets and other services (Ferris et al., 2014). Smallholders can overcome geographical barriers and reduce high logistics costs through adequate infrastructure. Good roads allow small farmers to deliver their crops more efficiently and in less time. Farmers can access a broader market, send their produce to distribution centers, and sell their crops at better prices. Good road infrastructure also facilitates access to agricultural extension centers, financial institutions and health care facilities, so that smallholder farmers can get the information, support and services they need.

## **Research Implication**

The study provides valuable insights into the complex interplay between human activities, environmental sustainability, and the welfare of small farmers in the Kayan Sembakung Delta. The implications drawn from this research are multifaceted, encompassing environmental conservation, agricultural practices, and socio-economic development. This section discusses the key research implications, emphasizing potential areas for further investigation and practical applications.

Environmental conservation and sustainable agriculture. The findings highlight the need for a concerted effort towards the conservation of wetland ecosystems, particularly peat lands and mangrove forests. Policies and strategies should be developed to ensure the sustainable use of these areas, taking into account the carrying capacity and environmental capacity. Further research could delve into specific conservation measures, including the restoration of degraded areas and the promotion of sustainable agricultural and fishery practices.

Welfare enhancement for small farmers. The study identifies various factors influencing the subjective and objective welfare of small farmers. Policymakers and stakeholders should focus on targeted interventions to improve the living conditions of farmers in Tanjung Buka Village. Initiatives such as housing improvements, access to cooking fuel, food security, and income diversification should be prioritized. Future research could explore the effectiveness of specific interventions and their longterm impact on farmer welfare.

NESP Approach. The utilization of the NESP approach in assessing poverty and welfare provides a comprehensive framework. This method could be applied in similar contexts to assess and address poverty from a multidimensional perspective. Researchers and policymakers in other regions can adopt and adapt the NESP approach to gain a nuanced understanding of poverty and guide targeted interventions.

Community engagement and empowerment. Sustainable development in the Kayan Sembakung Delta requires active involvement and empowerment of the local community. Initiatives should be designed collaboratively with the community to ensure cultural sensitivity and local relevance. Future research may explore participatory approaches in decision-making, community-based conservation efforts, and the role of indigenous knowledge in promoting sustainability.

Policy development and implementation. The study underscores the importance of effective policy implementation for achieving environmental conservation and improving farmer welfare. Policymakers should consider the integration of local regulations, infrastructure development, and support for community-driven initiatives. Future research could assess the impact of existing policies and recommend modifications for better alignment with the needs of the community and the environment.

Education and capacity building. Enhancing the capacity of small farmers through education and skillbuilding initiatives is crucial for long-term sustainability. Research can explore the effectiveness of training programs, awareness campaigns, and educational interventions in improving agricultural practices, resource management, and overall community resilience.

Cross-border collaboration. Given the border area there is potential for cross-border context, collaboration in addressing shared environmental challenges and promoting sustainable development. Future research could explore opportunities for regional cooperation, knowledge exchange, and joint conservation efforts among neighboring countries. The research on smallholding farmers in the Kayan Sembakung Delta provides a foundation for actionable insights and future exploration. The implications outlined above emphasize the interconnectedness of environmental conservation, agricultural practices, and community well-being, urging a holistic and collaborative approach to address the complex challenges faced by small farmers in border areas of Indonesia.

Technological innovations for agricultural sustainability. The integration of technology in agriculture can play a pivotal role in enhancing both productivity and sustainability. Future research could explore the adoption of precision agriculture, remote sensing, and other advanced technologies to optimize resource use, monitor environmental changes, and improve overall agricultural efficiency. Additionally, the study could investigate the barriers and facilitators to technology adoption among small farmers in the Kayan Sembakung Delta.

Climate change resilience and adaptation. Considering the vulnerability of wetland ecosystems to climate change, it is imperative to assess the resilience of smallholding farmers. Research can delve into climate change adaptation strategies, such as resilient crop varieties, water management techniques, and early warning systems. Understanding the local impacts of climate change and developing adaptive measures can contribute to long-term sustainability and the well-being of the farming community.

Market access and value chain development. Improving market access and strengthening value chains are critical components of rural development. Research could explore ways to enhance the marketing capabilities of small farmers in Tanjung Buka Village, facilitating their integration into broader markets. Attention to post-harvest infrastructure, market information systems, and cooperative structures could contribute to increased income and overall economic well-being.

Gender dynamics in agriculture. An in-depth examination of gender dynamics within agricultural practices and household welfare is essential. Research could investigate the roles of men and women in smallholding farming, addressing potential gender disparities in access to resources, decision-making power, and the benefits derived from agricultural activities. Understanding these dynamics can inform gender-sensitive interventions aimed at promoting equitable development.

Ecosystem services valuation. Assigning economic value to ecosystem services can strengthen the case for conservation and sustainable resource management. Future research could employ ecosystem services valuation methods to quantify the benefits provided by wetland ecosystems. This includes assessing the economic value of water purification, flood regulation, and biodiversity conservation, providing policymakers with tangible incentives for investing in the preservation of these ecosystems.

Community-based ecotourism opportunities. the Exploring potential for community-based ecotourism initiatives can contribute to both conservation and economic development. The Kayan Sembakung Delta's unique ecological features may attract ecotourists, providing an alternative income source for local communities. Research could investigate the feasibility, challenges, and benefits of implementing such initiatives, ensuring they align with sustainable and culturally sensitive practices.

Longitudinal studies for sustainable impact assessment. To measure the lasting impact of interventions and changes in the Kayan Sembakung Delta, longitudinal studies are crucial. Future research could establish a continuous monitoring system to assess the sustained effects of welfare-improvement conservation efforts, and programs, policy implementations. This longitudinal perspective will provide valuable insights into the resilience and adaptability of the community and ecosystems over time.

Partnerships with non-governmental organizations (NGOs) and international organizations. Collaboration with NGOs and international bodies can amplify the impact of interventions in the Kayan Sembakung Delta. Research may explore opportunities for partnerships that bring additional resources, expertise, and global best practices to address environmental and social challenges. Such collaborations could facilitate knowledge exchange, capacity-building, and the implementation of effective, evidence-based interventions.

The research implications outlined above extend the scope of the study on smallholding farmers in the Kayan Sembakung Delta, providing a comprehensive roadmap for future research and practical applications. By addressing technological, climatic, market-related, gender, and ecological dimensions, researchers and policymakers can work towards holistic and sustainable solutions that foster the wellbeing of small farmers and safeguard the unique wetland ecosystems in border areas of Indonesia.

## CONCLUSION AND SUGGESTION

Tanjung Buka Village has a food supply area with an  $I_{ecc}$  value of 4.32-4.76 which includes a very high carrying capacity of 71,763.74 ha. The area in question is an area with a Kalimantan fluvial land landscape with herbaceous vegetation on brackish river banks and land cover in the form of primary mangrove forests and dams. Smallholder farmers in food supply areas show high subjective and objective prosperity in the medium category. The medium category shows that farmers do not feel welfare, especially regarding material ownership, health, protection of nature as a food source, community living conditions, community structure and services. Recommendations for efforts that can be made to improve farmers' welfare are repairing uninhabitable houses, providing fuel for cooking, seeking aid for food, especially protein (meat, eggs, fish), providing clean water, increasing the diversity of sources of income, facilitating the search for a livelihood (employment), increasing awareness and ability to save, ensuring sufficient garden/crop land, conserving endemic animals, conserving wood and plant species, getting involved in politics, guaranteeing land ownership, implementing regional regulations, repairing roads and bridges, and organizing counseling/training/courses/ entrepreneurial assistance.

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