



## Assessing the Role of Local Sasi Practices in Environmental Conservation and Community Economic Empowerment in Maluku, Indonesia

Marthinus J. Saptanno<sup>1</sup>, Natelda R. Timisela<sup>2\*</sup>

<sup>1</sup> Faculty of Law, Pattimura University, Ambon 97233, Indonesia

<sup>2</sup> Faculty of Agriculture, Pattimura University, Ambon 97233, Indonesia

Corresponding Author Email: [natelda.timisela@faperta.unpatti.ac.id](mailto:natelda.timisela@faperta.unpatti.ac.id)

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<https://doi.org/10.18280/ijstdp.190418>

### ABSTRACT

**Received:** 15 August 2023

**Revised:** 4 January 2024

**Accepted:** 3 February 2024

**Available online:** 28 April 2024

#### Keywords:

*Sasi, environmental, conservation, community, empowerment, economic*

The problem of this research is how Sasi can be applied properly to preserve resources and its impact on the community's economy. The Sasi is a tradition carried out by the Maluku people with the main aim of preserving resources. The Sasi tradition is a culture from Maluku that was inherited by the ancestors of the Maluku people for centuries. The Sasi culture is carried out because of two principles, namely that natural products must not be enjoyed for a certain period of time that are not yet suitable for use and to provide satisfaction from the results of one's own efforts. This research assessing the role of local Sasi practices in environmental conservation and community economic empowerment. The research was carried out in Seith Village and Rutong Village, Ambon Island in July-August 2022. These locations were selected through purposive sampling since the implementation protects agricultural and fishery resources. Furthermore, a sample of 80 individuals was selected using simple random sampling methods. The results showed that Sasi embodied significant philosophical values such as trust, excellent/mutual collaboration, collaboration between the village government, church, mosque and society, moral and ethical values to sustain the existing natural resources and prevent extinction, and the principle of not stealing the property of others. In addition, the analysis indicated moderate values of  $R^2$  at 0.408, 0.616, and 0.564 for the different parameters. The coefficients for the variables of BS to EP, BS to CEI, and SM to EP showed significant values since the p-value was less than 0.05. Conversely, the coefficients of SM to CEI and EP to CEI indicated no significant effect, with p-values greater than 0.05.

## 1. INTRODUCTION

Maluku is an archipelagic region dominated by small islands with a substantial wealth of biological and non-biological natural resources. The traditional communities have practiced resource conservation since their ancestors to ensure the availability of these resources for future generations [1]. Meanwhile, environmental management is crucial to preserve functions, encompassing policies on arrangement, utilization, development, maintenance, restoration, supervision, and control of the environment [2, 3]. In the local resource management system, the community is familiar with utilization practices relying on an understanding of the relationship between humans and nature, as well as with God. The management and utilization of land and sea resources are regulated through a system of property rights, food rights, guard rights, and user obligations, which reflect the values of kinship, togetherness, caring, maintenance, and sustainability.

Local wisdom is community knowledge that emerges from a long period of evolution and is used as a basis for environmental management principled for sustainable development [4]. As part of ethics and morality, it helps humans to answer moral questions about what and how,

specifically in the field of environmental and natural resource management [5, 6]. Furthermore, the management of coastal natural resources controls human or community actions to ensure the utilization of these resources while adhering to the principles of environmental sustainability [7]. The community plays a pivotal role, emphasizing the need for strategies that empower local resources [6]. Local wisdom is also a conservation strategy to maintain, protect and preserve the environment and natural resources. Sasi is a form of local wisdom that protects certain areas with natural resources, specifically in the Maluku Islands, managed by traditional or religious institutions [8].

Sasi is a social institution deeply rooted in the culture of indigenous peoples, and it ensures the continuous growth and development of natural resources. Specifically, biological and vegetable resources require conservation for a specific period to restore growth and development, leading to satisfactory results [9, 10].

Research [11] suggests that one of the tribes in Maluku that still adheres to the Sasi tradition is the Kei tribe in Southeast Maluku Regency. Sasi is a form of prohibition on the extraction of natural resources, both land and sea, within a certain period of time, thereby allowing natural resources to

grow, develop and be preserved. The behavior of the Ohoi Ngilingof community in implementing the Sasi tradition is very good, the community is very obedient to the tradition. Research [12] states that Sasi is a form of local wisdom originating from Maluku. This form of local wisdom is an effort to preserve land and sea natural resources and can help conservation efforts. If Sasi has been implemented by the community, the impact will be that the community will not dare to violate these regulations, so this system is very appropriate to use as a means of managing natural resources both on land and at sea [13]. Several Sasi are carried out in marine areas on marine biota such as lompas fish, sea cucumbers and lola. Lompas fish can be found in several areas in Maluku such as Ambon Island, Seram Island and Haruku Island [14]. Ecologically, Lompas fish have an important role in the food chain, namely as a source of food for other fish. Sea cucumbers are one of the marine biotas protected by the Sasi system, because they have high economic value and are spread throughout almost the entire Maluku Islands region [15]. Lola is marine biota that is included in the protection of the Sasi system. According to the government, the lola is a protected animal based on Government Regulation Number 7 of 1999. The size of the lola that can be taken is 8 cm, if the lola is smaller than that size then the lola cannot be harvested [16].

Sasi is intended to preserve marine and coastal ecosystems for future generations in close association with the green and blue economy. The utilization of natural resources will be more sustainable when the land and sea are well-maintained. Meanwhile, the principle of a green economy is sustainable economic activity, which means using natural resources can be conducted without damaging the environment. A green economy promotes human welfare, environmental sustainability, and ecosystem preservation [17]. The principle of the blue economy is the efficiency of nature, where the concept imitates and enriches nature efficiently. Blue economy development is carried out through four pillars: integrating land and sea development, clean, inclusive, and sustainable development, increasing added value and product competitiveness through innovation, and enhancing a just, equitable, and appropriate society [18].

The Sasi law has been in practice for a significant time in Maluku. It was developed by the ancestors, considering society's economic, social, and cultural aspects. People from various ethnic, religious, and racial backgrounds densely populate the small islands of Maluku. Due to the limited natural resources, the Sasi law was developed to manage these resources sustainably. The Sasi law has a deep philosophical foundation, followed by indigenous peoples and local communities. It has been developed since ancient times by the ancestors, who recognized the importance of managing the economic situation and meeting the needs of people on small islands. Therefore, this research aims to assessing the Role of Local Sasi Practices in Environmental Conservation and Community Economic Empowerment in Maluku, Indonesia".

## 2. RESEARCH METHODS

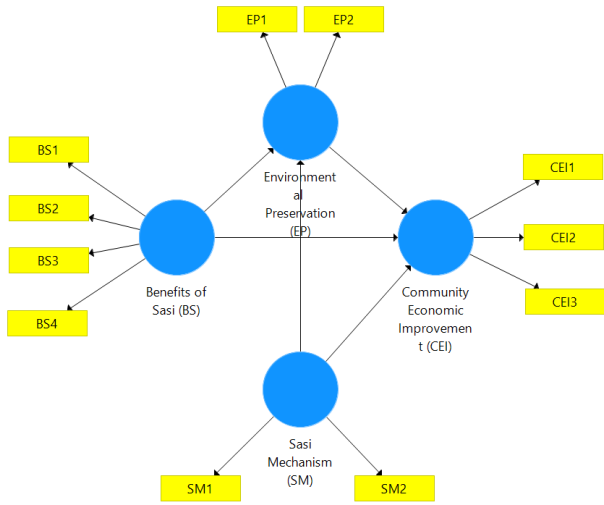
The research was conducted in Seith and Rutong Country, located on Ambon Island, during the period of July-August 2022. The selection was conducted through purposive

sampling due to the ongoing implementation of Sasi in these areas, aimed at protecting agricultural and fishery resources. Meanwhile, the sample was determined using a simple random sampling method to select 80 individuals. The data were analyzed qualitatively and quantitatively to describe the Sasi process in Seith and Rutong on Ambon Island. The quantitative method was employed to evaluate the effectiveness of Sasi in promoting environmental preservation and enhancing the community's economic well-being. Analysis of the use of Sasi for preservation and community economic improvement used SEM-PLS to determine the relationship between variables. Likewise, the determination of the sample response used a Likert scale of 1-5. Table 1 shows the variables and research indicators regarding using Sasi for environmental conservation and improving the community's economy. An instrument can be used to measure something if the instrument is valid. A valid instrument means that the measuring instrument used to obtain the data is valid. Validity testing is carried out by testing construct validity. Construct validity testing of the question items in the instrument is in accordance with scientific concepts. Validity testing is carried out using the Product Moment correlation formula to determine the relationship between two variables (symptoms) on an interval scale (a scale that uses actual numbers). The validity test was calculated using the Statistical Package for Social Science (SPSS) version 21 computer assistance. Reliability refers to the understanding of whether an instrument can measure something that is measured consistently over time [19]. Reliability testing with internal consistency is carried out by testing the instrument only once, then what is obtained is analyzed using certain techniques. The results of the analysis can be used to predict the reliability of the instrument. Instrument reliability testing was carried out using the Cronbach's Alpha formula because the data was interval data. Reliability tests were carried out on all statement items. The decision making criteria for determining its reliability is that if the r (Cronbach's alpha) value is greater than 0.60 then the instrument is said to be reliable. On the other hand, if the r (Cronbach's alpha) value is smaller than 0.60 then the instrument is not reliable.

**Table 1.** Research variables and indicators

<b>Variables</b>	<b>Indicator</b>
Benefits of Sasi (BS)	BS1: protecting natural resources
	BS2: preserve natural produce
	BS3: improving the community's economy
	BS4: avoiding the extinction of natural resources, both land and sea
Sasi Mechanism (SM)	SM1: traditions related to restrictions on access to territory or resources
	SM2: protection of indigenous peoples
Environmental Preservation (EP)	EP1: increasing the sustainability of natural resources
	EP2: increasing the quality and quantity of natural resources
Community Economic Improvement (CEI)	CEI1: supporting regional economic growth
	CEI2: increasing people's income
	CEI3: community welfare improvement

Data analysis using SEM-PLS with the model shown in Figure 1 below.



**Figure 1.** SEM-PLS modeling factors influencing Sasi utilization for environmental preservation and community economic improvement

### 3. RESULTS AND DISCUSSION

#### 3.1 Utilization of Sasi

Efforts to preserve the environment for the people of Maluku have been carried out for a long time. Sasi is a community tradition with substantive legal value, namely a temporary prohibition against taking land and sea products until a specific time. The Sasi law is a customary regulation passed down through generations and prohibits harvesting natural resources from land and sea before a designated time. Any violation of this law will result in a corresponding sanction or punishment. The primary purpose of implementing the law is to promote the sustainable preservation of natural resources.

The law dramatically benefits society due to its ability to safeguard natural products. Furthermore, it is instrumental in elevating the economic standards of the community, ensuring the safe and sustainable use of natural resources, and preserving the environment. The law is also pivotal in promoting economic growth by enhancing the economic value of natural resources and maintaining a consistent production output of crops. Generally, the law is crucial for sustainable development and resource management.

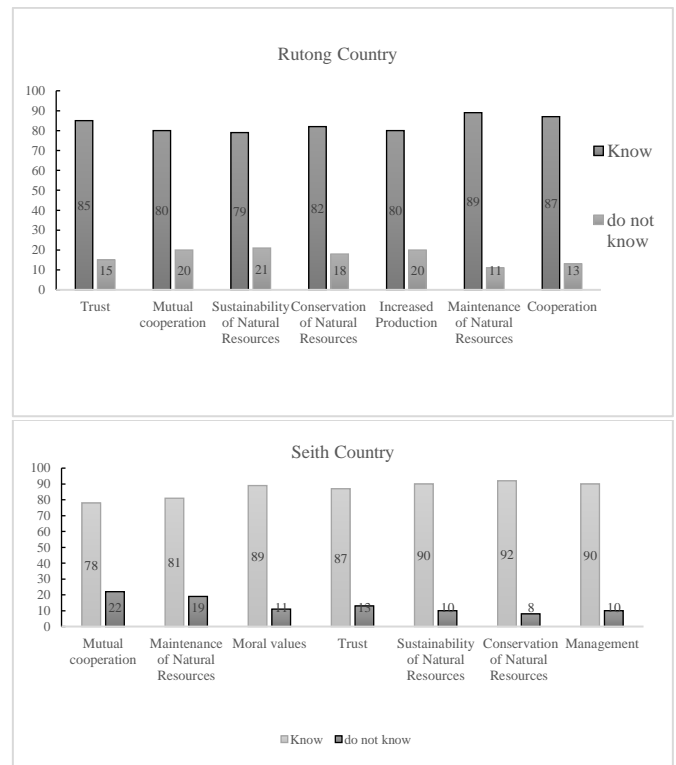
Sasi is a valuable practice for the sustainable utilization of natural products. The people of Maluku have upheld this tradition to preserve the natural potential of the region. The implementation involves prohibiting the harvesting of produce from a particular area for a specific period, as determined by the local church, mosque, or village government. The continued relevance lies in its ability to ensure the continual production of natural resources through responsible management. Neglecting the principles of Sasi could lead to the depletion of natural resources, rendering them extinct and no longer available in the natural environment.

The regular implementation of Sasi brings numerous benefits in harvesting natural products. One of the primary objectives is to safeguard the region's natural resources by imposing a temporary ban on harvesting land-based crops and marine products, as determined by the village government. This result is in line with the opinion [13] that if Sasi has been

implemented by the community, the impact is that the community will not dare to violate these regulations, so this system is very appropriate to use as a means of managing natural resources both on land and at sea. In implementing Sasi, it is based on community knowledge about a certain time or period to know when a resource can be harvested so that the life cycle of an organism is not disturbed [20]. In the implementation of Sasi there are terms opening Sasi and closing Sasi. The opening of Sasi is the time when people are allowed to harvest or people are allowed to take resources that are ready to harvest, and the closing of Sasi is the time when people are not allowed to take existing resources [21]. According to a survey, 80% of the respondents acknowledged the positive impact on their livelihoods, while 20% expressed no perceived benefits. The respondents who acknowledged the significance attributed the concept to local wisdom to preserve the region's natural resources. Individuals who lack awareness regarding the significance of Sasi often fail to comply with the regulations concerning Sasi, resulting in the limited availability of specific plants. The Sasi system serves as the foundation of customary law. It holds significant legal value, which includes the proper utilization of rights within a specified timeframe, the prevention of disputes among members of the community, the preservation of the natural environment for the benefit of the common good, the obligation to use marine and land-based resources sustainably, and the reduction of criminal activity in the form of theft.

#### 3.2 The philosophical values contained in Sasi

Philosophical values refer to beliefs guiding individuals in achieving their ultimate goals. These values are regarded as fundamental principles or standards that shape the perspective of individuals on life. Based on the opinions expressed by respondents in Rutong and Seith Country, the philosophical values embedded within the Sasi law can be seen in Figure 2.



**Figure 2.** The philosophical values contained in the Sasi law  
Source: Primary data, 2022 (processed)

According to Figure 2, the values encapsulated in the Sasi law comprise trust, mutual cooperation, natural resource sustainability, increased production, and maintenance of natural resources. Rutong and Seith communities harbor deep faith in the Sasi law based on three fundamental pillars. The first pillar establishes a connection between the Church and Mosque with the Creator, while the second pillar links the country with ancient parents or ancestors. The third pillar signifies the role of the community as a provider of crops for Sasi. These pillars form the bedrock of the strong collaboration and interdependence between the church/mosque, state, and society. This foundation enables Rutong and Seith Country to preserve the philosophical values of Sasi.

Furthermore, the community staunchly believes in the Sasi law because it increases crop yields. The spirit of cooperation remains a hallmark of the villages on Ambon Island, where Sasi is employed. The community also brings plants to the church/mosque to pray for their growth when Sasi is closed.

The current public opinion indicates that 83% of individuals still uphold the principles of the Sasi philosophy, as it aligns with preserving natural resource ecosystems. However, the steady enforcement of Sasi shows that 73% of respondents observe a decline in its implementation due to competing interests, such as the persistent exploitation of land and sea products, leading to neglect of environmental conservation. This could be attributed to a lack of fear or belief, leading individuals to harvest crops under Sasi protection freely.

### 3.3 Utilization of Sasi for environmental preservation and community economic improvement

Preserving natural resources to ensure continued growth and development is an integral aspect of the Sasi's role. Maintaining vegetative natural resources requires a specific duration to restore their growth and development, ensuring optimal yields. Without an enabling environment, natural resources cannot thrive as intended. Consequently, it is crucial to continually uphold the maintenance of Sasi to guarantee the preservation of natural resources for future generations [9]. This is also supported by study [22], where Sasi plays an essential role in environmental management under shared responsibility and sustainability principles. The principle of natural resources aims to achieve sustainable development and maintain the environmental balance, ensuring that the next generation can also benefit.

The benefits of Sasi include protecting natural resources, maintaining products, and improving the community's economy. Meanwhile, factors related to the Sasi mechanism include restricting access to territories or resources and protecting indigenous peoples. Factors for environmental preservation include increasing the sustainability, quality and quantity of natural resources. The community's economy can be improved by supporting regional growth, income, and welfare. The results of the SEM-PLS analysis are shown in Figure 3.

The measurements of the model are conducted using reliability and validity analysis. The reliability analysis results show that the minimum value of Cronbach's Alpha is 0.8 or 0.9. Furthermore, the  $\rho_c$  (composite reliability) value is also used, interpreted as Cronbach's Alpha value. Each latent variable must explain the variance of the indicator by at least 50%. Therefore, the absolute correlation between the latent variable and the indicator must be  $> 0.7$  as the absolute value of the outer standard loadings.

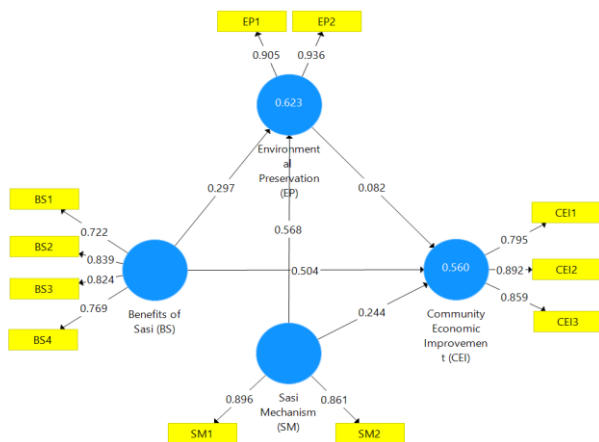
The Cronbach's Alpha and the Construct Reliability values are shown in Table 2. Cronbach's alpha and composite reliability measure a construct's lower limit and actual values. Composite reliability is considered better in estimating the internal consistency of a construct. In addition, the rule of thumb used for the Composite Reliability and Cronbach's alpha values are greater than 0.7 [23]. It can be seen that all Cronbach's Alpha and Construct Reliability values are  $> 0.7$ , and the validity for all constructs is good because the AVE value is more than 0.5.

Measurement of discriminant validity uses the criteria proposed by Fornell-Larcker and "cross-loadings". The Fornell-Larcker postulate states that a latent variable shares variance with the underlying indicator rather than others, and the Criteria Values are shown in Table 3.

The numbers on the diagonal are the AVE roots, and the other numbers are the correlation coefficients between variables. The requirement for the construct to have good discriminant validity is that the AVE root value should be greater than the correlation coefficient. Since all the correlation coefficient numbers are smaller than the AVE root values, it can be concluded that all the numbers developed in the model have good discriminant validity. When interpreted statistically, the AVE value must be greater than the highest R<sup>2</sup> with the other latent variable. Table 3 shows the AVE root value of each construct or variable, and the numbers indicate the results.

The R-squared test (R<sup>2</sup>) measures a structural model's Goodness of Fit level. The value measures the influence of certain independent latent variables on the dependent. According to studies [24, 25], the R<sup>2</sup> result of 0.67 indicates that the model is good. The R<sup>2</sup> between 0.33 and 0.67 shows that the model is categorized as moderate. Meanwhile, the R<sup>2</sup> of 0.33 indicates that the model is weak, and the values are 0.623 and 0.560 in the moderate category.

Bootstrapping is a process for assessing the significance level or probability of direct, indirect, and total effects. The process can also assess the significance level of other values, including r square and adjusted r square, f square, outer loading, and outer weight. In the complete PLS SEM bootstrapping method, all values analyzed in the partial least square analysis are bootstrapped to produce their probability. The path coefficient values between constructs determine the relationship's significance and strength. Path coefficient values range from -1 to +1, and the closer to the +1 value, the



**Figure 3.** The value of the loading factor (outer path), path coefficients (inner path), and R-squares as standard values in the model

stronger the relationship between the constructs. Meanwhile, a relationship closer to -1 is negative [26]. The bootstrapping approach leads to better estimation results. The structural bootstrapping model (inner model) results can be seen in Figure 4.

Table 4 shows that the magnitude of the parameter coefficient of the BS variable on EP is 0.297, meaning there is a positive influence of BS on EP. These results indicate that the BS value is directly proportional to the EP. An increase in one BS unit increases EP by 29.7%. Based on calculations using bootstrap or resampling, the estimated BS coefficient test results are 0.297 with a calculated t-value of 2.362 and a standard deviation of 0.126. Therefore, the p-value is 0.019 < 0.05, meaning BS directly affects EP or is statistically significant. This result is supported by research [27], where using Sasi or prohibitions on the Kei community is local wisdom to preserve natural resources from over-exploitation.

The parameter coefficient for the BS variable on CEI is 0.504, meaning the variables are directly proportional, and an increase in one BS unit increases CEI by 50.4%. The BS estimation coefficient test results on CEI with bootstrap were 0.504 with a t-count value of 3.791 and a standard deviation of 0.133. The p-value of 0.000 < 0.05 means BS directly affects CEI. These results are supported by research [28], where Sasi in the Koiwai community is performed at sea and on land to maintain resource availability, which has implications for ecosystem balance. Furthermore, Sasi has social and economic functions and maintains order in the Koiwai community.

The parameter coefficient for the SM variable on EP is 0.568, meaning the variables are directly related, and an increase in one SM unit increases EP by 56.8%. The SM estimation coefficient test results for EP with bootstrap were

0.568 with a t-count value of 5.323 and a standard deviation of 0.107. Furthermore, the Sasi mechanism supports environmental conservation [29], where Sasi culture can preserve the environment. It is forbidden to take and manage natural products within a certain period in the implementation of Sasi. During the Sasi, natural resources can grow and reproduce without any disturbance. The p-value of 0.000 < 0.05 means the direct effect of SM on EP. The other two coefficients, SM and EP on CEI, have no significant effect. This is because the p-value is greater than 0.05. Hence there is no direct effect of SM and EP on CEI.

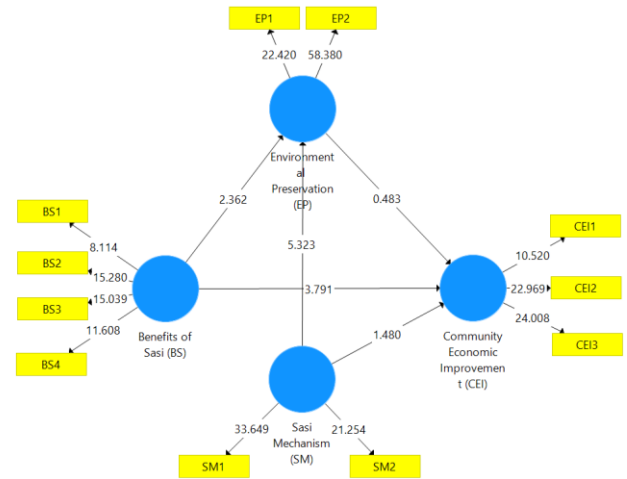


Figure 4. The t-Value resulting from bootstrapping between constructs (Inner model)

Table 2. Reliability and validity construct values

	Cronbach's Alpha	rho_A	Reliability Komposit	Rata-rata Varians Diekstrak (AVE)
Benefits of Sasi (BS)	0.800	0.807	0.869	0.624
Sasi Mechanism (SM)	0.706	0.714	0.871	0.772
Environmental Preservation (EP)	0.823	0.844	0.918	0.848
Community Economic Improvement (CEI)	0.806	0.812	0.886	0.722

Source: Primary data, 2022 (processed)

Table 3. Fornell-larcker criteria values

	Benefits of Sasi (BS)	Sasi Mechanism (SM)	Environmental Preservation (EP)	Community Economic Improvement (CEI)
Benefits of Sasi (BS)	<b>0.790</b>			
Sasi Mechanism (SM)	0.629	<b>0.879</b>		
Environmental Preservation (EP)	0.654	0.755	<b>0.921</b>	
Community Economic Improvement (CEI)	0.712	0.623	0.596	<b>0.850</b>

Source: Primary data, 2022 (processed)

Table 4. Path coefficient values of bootstrapping results

Construct	Original Sample (O)	Sample Average (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Benefits of Sasi (BS) -> Environmental Preservation (EP)	0.297	0.295	0.126	2.362	0.019
Benefits of Sasi (BS) -> Community Economic Improvement (CEI)	0.504	0.503	0.133	3.791	0.000
Sasi Mechanism (SM) -> Environmental Preservation (EP)	0.568	0.572	0.107	5.323	0.000
Environmental Preservation (EP) -> Community Economic Improvement (CEI)	0.082	0.064	0.169	0.483	0.629
Sasi Mechanism (SM) -> Community Economic Improvement (CEI)	0.244	0.265	0.165	1.480	0.139

Source: Primary data, 2022 (processed)

#### 4. CONCLUSIONS

Sasi or prohibitions on the community is local wisdom to preserve natural resources from over-exploitation. Sasi is performed at sea and on land to maintain resource availability, which has implications for ecosystem balance. Furthermore, Sasi has social and economic functions and maintains order in the community. During the Sasi, natural resources can grow and reproduce without any disturbance. The results show an  $R^2$  value of 0.623 and 0.560 in the moderate category. In addition, the magnitude of the parameter coefficients for the variables BS to EP, BS to CEI, and SM to EP shows a significant value. This is because the p-value is smaller than 0.05 while the other coefficients, namely SM to CEI and EP to CEI, have no significant effect since the p-value is greater than 0.05.

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