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Sasi As A Socio-Ecological Mechanism For Building Community Resilience And Sustainable Well Being In Negeri Piliana, Maluku

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Abstract

This study examines the role of Sasi as a socio-ecological governance mechanism in strengthening community resilience and sustainability in Negeri Piliana, Tehoru District, Central Maluku Regency, Indonesia. Negeri Piliana was selected as the study site because it is among the few communities in Maluku that continue to actively practice Sasi as an integral part of community governance, particularly in the management of forest resources that provide food, water and spiritual value to local people. The study argues that sustainability within the Sasi system lies in the capacity of the socio-ecological system to continuously learn, adapt, and collectively reorganize resources while maintaining its cultural identity. The revitalization of Sasi is supported by three interrelated pillars: the strengthening of customary institutions, the application of adaptive local norms, and the equitable distribution of benefits among community members. The findings contribute to the broader discourse on local wisdom-based natural resource governance by demonstrating how indigenous institutions can foster resilience and long-term sustainability. Furthermore, the study offers practical implications for the development of social-forestry policies and the recognition of customary institutions within Indonesia's conservation and natural resource governance frameworks

Keywords: Sasi; Socio-ecological governance; community resilience; ecological stewardship; sustainability; customary institutions; social forestry.

INTRODUCTION

Environmental pressures have continued to intensify in Indonesia over the past several

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decades as a result of economic growth, industrialization, and changing societal lifestyles. Deforestation, environmental pollution, and the excessive exploitation of natural resources have caused significant ecosystem degradation, threatening environmental sustainability and human well-being, particularly among indigenous communities whose livelihoods are highly dependent on nature. The Ministry of Environment and Forestry reported that between 2021 and 2022, deforestation covered approximately 123,000 hectares of land. Meanwhile, according to Global Forest Watch, Indonesia lost approximately 30.8 million hectares of tree cover between 2000 and 2023, representing a 19% decline in total tree cover since 2000.

Deforestation also constitutes a major component of the national climate crisis. Processes of deforestation and forest degradation in tropical regions are among the primary contributors to greenhouse gas (GHG) emissions, accounting for between 0.3 and 1.8 gigatons of CO_2 annually in global deforestation-related emissions, while reforestation activities have a sequestration potential ranging from 0.1 to 2.6 $GtCO_2$ per year (Basuki et al., 2022). According to Climate Action Tracker (CAT), Indonesia's land-use and forestry sector contributes nearly half of the country's total annual emissions, approximately 1 $GtCO_2e$ per year. Furthermore, the forestry sector accounts for around 60% of Indonesia's mitigation target under its Nationally Determined Contribution (NDC) toward 2030.

In this context, indigenous communities, particularly those whose livelihoods depend directly on forest resources, are among the most vulnerable groups. Land degradation results in declining soil productivity, increased erosion and drought, and directly affects local livelihoods such as agriculture and non-timber forest product collection (Dewi et al., 2023). A study conducted by Hidayat and Sinaga (2021) in Gunung Mas, Central Kalimantan, demonstrated how deforestation reduced the socio-economic resilience of local communities and increased poverty due to limited access to land and education.

In many cases, top-down environmental conservation policies have themselves become sources of pressure on local communities. Armitage et al. (2017), in their study of coastal communities in the Philippines, found that conservation approaches that reduce local participation may weaken adaptive capacity and undermine social-ecological resilience. In Central Maluku, several indigenous communities in the Manusela Mountains have experienced restrictions on their living spaces as a result of forest conservation policies, including the reclassification of portions of customary territory into Convertible Production Forest (Hutan Produksi Konversi/HPK) areas (Mongabay, 2025). Such top-down conservation policies may therefore contribute to declining adaptive capacity and weakened social-ecological resilience.

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Amid these pressures, the Sasi system in Negeri Piliana, Tehoru District, Central Maluku Regency, serves as a social-ecological mechanism through which communities respond to various forms of change and disturbance. Fundamentally, Sasi is a traditional conservation practice found throughout Maluku and parts of Papua that has been maintained across generations. In Piliana, however, Sasi is understood as more than merely a conservation practice; it is a normative system that regulates not only the use of natural resources but also reciprocal relationships between humans and nature. The system encompasses a set of norms, knowledge systems, and institutions—including the Saniri (customary council) and Kewang (customary environmental guardians)—that facilitate community-based resource governance while strengthening collective adaptation to both external and internal pressures. Negeri Piliana, with a population of 590 people living in 154 households (Tehoru District in Figures, 2025), exists in relative geographical isolation, a condition that reinforces reliance on local systems of life, including Sasi, to sustain both environmental integrity and communal well-being.

The Sasi system in Piliana is not a static institution; rather, it continuously faces multiple interacting pressures. Externally, national conservation policies and commercial activities such as plantation expansion and proposed mining developments threaten customary territories. Internally, declining youth participation in customary practices, weakening transmission of traditional ecological knowledge, shifts from collective to individualistic values, migration, and increasing dependence on external markets all contribute to the erosion of community adaptive capacity. In addition, legal recognition of customary rights and local governance authority in Piliana remains limited, creating further vulnerabilities when community interests intersect with state policies concerning land control and resource utilization.

Previous studies on Sasi have provided important foundations for understanding this institution but leave several significant gaps. First, most literature conceptualizes Sasi primarily as an ecological conservation mechanism designed to preserve environmental sustainability and regulate natural resource use. However, these studies have not explicitly examined how Sasi functions as a mechanism for strengthening community resilience and enabling adaptation and recovery from both external and internal disturbances. Second, much of the existing literature relies on broad theoretical discussions, cross-regional comparisons, or historical datasets, providing limited contemporary and localized analyses of specific communities. Negeri Piliana, with its distinctive customary and environmental dynamics, has received relatively little scholarly attention. Third, while some studies have begun exploring the roles of women and indigenous communities in general, few have investigated in depth how different social groups interact with

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and are affected by Sasi practices.

Based on these gaps, this study aims to analyze the role of the Sasi system as a social-ecological mechanism for strengthening resilience and sustainability in Negeri Piliana. Specifically, the study addresses the following research questions:

1. How does the Sasi system function as a social-ecological mechanism that helps the Piliana community adapt to external pressures (such as conservation policies and climate change) as well as internal pressures (including shifts in social values, economic dependency, and migration)?
2. How can the revitalization of the Sasi system strengthen the resilience and sustainability of the Piliana community through the reinforcement of customary institutions, equitable benefit distribution, and resource management based on local norms?

This study is expected to enrich understanding of how traditional customary systems can remain relevant in the face of contemporary change and how policies supporting local wisdom can be developed to ensure long-term community sustainability. By focusing specifically on Piliana, this research also contributes to filling existing gaps in data and narratives regarding Sasi practices in under-documented regions, while expanding scholarly understanding of the diversity of Sasi implementation across Maluku.

Theoretical Framework

Social-Ecological Systems and Sustainability

The Social-Ecological Systems (SES) framework emerged in response to growing recognition that global environmental change and ecosystem degradation cannot be adequately understood by separating biophysical processes from social dynamics. Environmental change is the result of continuous interactions between social and ecological processes that mutually influence one another (Chapin et al., 2009). Within the SES framework, sustainability is not solely concerned with the conservation of natural resources but also with the capacity of social systems to manage and adapt to environmental change. Berkes and Folke (1998) emphasize that local institutions and traditional knowledge are key components in maintaining the integrity and functionality of social-ecological systems.

This study adopts the SES perspective, which views humans and nature as interconnected components of a single integrated system. Rather than treating society and the environment as separate entities, the SES framework highlights the reciprocal relationships through which

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ecological conditions shape social practices, while social institutions and cultural values influence ecological outcomes. Consequently, sustainability is understood as the capacity of a social-ecological system to maintain its essential functions, structures, and identity while responding to change.

Resilience, Adaptive Capacity, and Transformation

Resilience is defined as the capacity of a system to absorb disturbances and reorganize while maintaining its core functions, structures, and identity (Chapin et al., 2009). Within the context of Piliana, resilience is closely associated with adaptive capacity, namely the ability of individuals and communities to learn, innovate, and adjust to both internal and external pressures (Chapin et al., 2009). Adaptive capacity enables communities to respond to environmental, social, and economic changes without undermining the long-term viability of the system.

However, adaptation alone may not always be sufficient. When a system is no longer capable of maintaining its essential characteristics through adaptation, transformation becomes necessary. Chapin et al. (2009) define transformation as the capacity of a social-ecological system to reorganize itself into a fundamentally different configuration, particularly when existing ecological, social, or economic conditions can no longer be sustained. Transformation involves the creation of new institutions, practices, and relationships that allow communities to navigate changing circumstances while preserving core values and objectives.

Together, resilience, adaptation, and transformation constitute essential foundations for addressing ecological uncertainty, social change, and emerging environmental challenges. These concepts provide an analytical lens through which the dynamics of the Sasi system can be understood as both a mechanism of continuity and a source of innovation.

Adaptive Governance

Chapin et al. (2009) define adaptive governance as a social framework that integrates decision-making processes, stakeholder coordination, value systems, scientific and local knowledge, and political dynamics influencing natural resource management. Fundamentally, adaptive governance refers to institutional arrangements that are flexible, responsive to ecological feedback, and capable of learning from changing conditions.

Adaptive governance emphasizes the importance of institutions that can manage ecosystems sustainably while mitigating pressures that threaten both social and ecological systems. Rather than relying on rigid regulatory structures, adaptive governance promotes

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collaborative learning, collective decision-making, and continuous adjustment in response to environmental and social change. Such governance systems enable communities to cope with uncertainty while maintaining ecosystem stewardship.

Within this framework, customary institutions play a critical role as intermediaries between formal regulations and local practices. They facilitate the integration of cultural values, traditional ecological knowledge, and community-based decision-making into resource governance processes. Consequently, customary institutions can strengthen the adaptive capacity and resilience of social-ecological systems by providing locally legitimate mechanisms for environmental management.

Positioning the Study within Previous Research

Previous studies on customary institutions in Indonesia have generally focused on four major themes: community-based natural resource management, community resilience in the face of environmental change, the strengthening of customary institutions, and local economic empowerment. While these studies have contributed valuable insights, they often examine these themes separately.

This study extends the existing literature by examining Sasi in Negeri Piliana as a social-ecological mechanism that integrates adaptive governance, social memory, and resilience within a single analytical framework. Furthermore, unlike many previous studies that focus on coastal communities where Sasi is more commonly practiced, this research investigates a mountainous indigenous community whose environmental conditions, livelihood systems, and vulnerability contexts differ significantly from coastal settings.

By situating Sasi within the broader framework of social-ecological systems, this study contributes to understanding how customary institutions function not only as mechanisms of environmental conservation but also as dynamic governance systems that strengthen resilience, facilitate adaptation, and support long-term sustainability in indigenous communities.

Research Methods

Research Approach and Design

This study employs a qualitative approach with an exploratory research design. The qualitative approach was selected to facilitate an in-depth understanding of participants' subjective meanings and social realities regarding the Sasi system in Negeri Piliana. Qualitative methods enable researchers to capture local narratives and lived experiences directly from the

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field, thereby providing a comprehensive understanding of complex social-ecological phenomena (Neuman, 2014).

An exploratory design was considered appropriate because the study seeks to investigate how Sasi functions as a social-ecological mechanism for resilience and sustainability within a specific indigenous community context. This approach allows for the identification of social, cultural, ecological, and institutional dimensions that may not be adequately captured through predetermined analytical categories.

Research Site and Participants

The study was conducted in Negeri Piliana, Tehoru District, Central Maluku Regency, Maluku Province, Indonesia. The site was selected because it is one of the few communities that continues to actively practice Sasi within forest and mountainous environments located on the slopes of Mount Binaiya.

Research participants were selected purposively based on their roles, responsibilities, and knowledge related to the implementation of Sasi. The participants included customary leaders (the Raja and members of the Saniri Negeri), Kewang or Maka Saka Tomonia (customary environmental guardians), religious leaders, women community leaders, and village government representatives. These individuals were considered key informants due to their direct involvement in customary governance, resource management, and community decision-making processes.

Data Collection Methods

Data were collected through three primary methods to ensure methodological triangulation:

1. Observation; participant observation was conducted to enable the researcher to engage directly with community activities and customary rituals while minimizing disruption to ongoing practices. This method allowed for the observation of social-ecological interactions within their natural setting and provided contextual insights into how Sasi operates in everyday life.
2. In-Depth Interviews; semi-structured, in-depth interviews were conducted with key informants to explore their perspectives on the role of Sasi as a mechanism for adaptation, resilience, and sustainability. Interviews focused on participants' experiences, interpretations, and understandings of customary governance, environmental stewardship, institutional change, and contemporary challenges facing the community.

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3. Document Analysis; document analysis was undertaken to collect secondary data from village archives, customary regulations, administrative records, and reports produced by supporting organizations. These documents provided historical, institutional, and contextual information that complemented data obtained through observation and interviews.

Data Analysis and Trustworthiness

Data were analyzed using a narrative-interpretive approach. Field findings were interpreted through the lens of the Social-Ecological Systems (SES) framework to identify relationships among ecological processes, customary institutions, social values, and adaptive practices. Analysis focused on understanding how Sasi functions as a governance mechanism that contributes to resilience, adaptation, and sustainability within the community.

Result and Discussion

Foundations and Social-Ecological Relations of Sasi

Sasi in Negeri Piliana cannot be separated from the community's collective identity, which is deeply rooted in a long historical relationship between people and nature. Origin narratives associated with *Mara Ina*, migration experiences that eventually culminated in settlement at *Liliyo-Losa*, and the community's identity as part of the *Siwa*[1]*-Alune*[2] cultural grouping constitute a framework of social memory that shapes collective understandings of how humans ought to relate to their environment. Chapin et al. (2009) emphasize the importance of social memory, referring to the knowledge, values, and experiences accumulated within a community that serve

[1] Valentijn, as cited in Bartels (2014), argues that the division between *Patasiwa* and *Patalima* originated from political alliances established during the era of the Ternate and Tidore Sultanates. The Confederation of Nine (*Patasiwa*) was associated with Tidore, while the Confederation of Five (*Patalima*) was linked to Ternate. Earlier narratives, however, connect the division to the legendary separation at *Heka Nunusaku*, a sacred mountain believed to be the ancestral origin of the Maluku people. According to these traditions, a major schism occurred at Nunusaku, prompting one group (*Patasiwa*) to move westward across Seram Island and another (*Patalima*) to migrate eastward (Bartels, 2014).

[2] Ethnographic literature on the indigenous peoples of Maluku frequently associates social identities on Seram Island with the *Wemale* and *Alune* groups. Bartels (2014) notes that both groups belong to the broader Alifuru population that has long inhabited Seram Island. The Wemale are considered among the earliest inhabitants of western Seram, whereas the Alune are generally associated with later settlements in the island's interior and mountainous regions. The identity of the Piliana community is more closely aligned with the Alune group, which is commonly associated with highland communities and the use of the Sopaa language.The identity of the people of Piliana is more closely associated with the *Alune* group, which is commonly linked to upland communities and the use of the *Sopaa* language. This affiliation reflects both the geographical location of Piliana within the mountainous interior of Seram and its cultural connections to broader *Alune* traditions and social organization.

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as a guide for responding to change. Through social memory, communities are able to learn from past experiences, preserve cultural practices, and adapt them to new contexts.

Within this context, the concept of *jaga loyor*[3] reflects the identity of the Piliana people as custodians of their ancestral land. The concept illustrates the community's enduring attachment to its ancestral territory in Manusela, explaining why the people of Piliana chose to remain in the area while other groups migrated elsewhere. For the Piliana community, customary identity represents a way of life that regulates relationships among community members, ancestors, and the territory they inhabit. History and social memory therefore provide the foundational framework through which human-environment relationships are understood, forming the basis for the operation of the entire Sasi system as a social-ecological mechanism.

This collective understanding is institutionalized through the *Petuanan* system, namely the customary territorial domain that functions as a social-ecological space linking access rights with collective responsibilities. Boundaries within the *Petuanan*, ranging from village territories to family-owned gardens, are marked by natural symbols such as Gadihu plants or durian trees. The Petuanan system regulates space and resource access, while customary values and norms ensure that rights to natural resources are inseparable from obligations to protect them.

From a social-ecological systems perspective, the *Petuanan* system represents a form of coupling between social components, such as identity and shared values, and ecological components, such as land, forests, and natural resources. Coupling refers to the reciprocal and interdependent relationship between social and ecological elements within a social-ecological system (Chapin et al., 2009). Through this relationship, social institutions influence ecological outcomes, while ecological conditions shape social practices and collective decision-making.

Built upon the foundations of identity and the Petuanan institution, customary values in Piliana promote environmental stewardship, understood as caring for nature as a moral responsibility rather than merely a utilitarian necessity. Within this worldview, nature is perceived as a moral entity deserving respect, and ecological imbalance is believed to have consequences for social harmony. Cultural values cultivate this sense of respect, customary regulations translate these values into concrete obligations and prohibitions, and ecological conditions provide tangible

[3] *Loyor* is a term commonly used in Maluku to refer to a small cloth or towel used to clean and care for infants and young children. In a broader cultural sense, the expression *menjaga Loyor* ("to safeguard the Loyor") carries a symbolic meaning that extends beyond its literal function. It refers to the act of preserving and protecting something inherited as a treasured legacy, remaining committed to it rather than abandoning or neglecting it. As a cultural metaphor, *menjaga Loyor* signifies the responsibility to maintain and uphold ancestral heritage, values, and collective identity across generations.

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feedback regarding the effectiveness of these norms.

Sasi positions natural resources as an ancestral trust that must be safeguarded for future generations. Through this mechanism, the community continuously evaluates the consequences of resource use on environmental conditions while reinforcing reciprocal relationships between humans and nature. When cultural values, customary regulations, and social-ecological conditions remain in harmony, the Sasi system is able to maintain both resilience and long-term sustainability.

The social-ecological foundations of Sasi in Piliana therefore rest upon the continuous interaction among collective identity, customary territorial governance, and stewardship values. Together, these elements transform Sasi into a living and adaptive social-ecological institution that sustains both community life and environmental integrity across generations.

Sasi as an Integrative Governance System

In Negeri Piliana, Sasi functions as a social-ecological governance system that integrates three interrelated dimensions within a cohesive institutional structure: the social, ecological, and moral dimensions. Zerner (1994) argues that the effectiveness of Sasi lies in its ability to maintain social order while simultaneously securing moral legitimacy within the community.

The social dimension is manifested through customary norms and institutional authorities, particularly the Saniri and Kewang, which provide mechanisms for regulating property boundaries, controlling social behavior, and resolving conflicts. Several informants emphasized that “Sasi helps ensure that no one steals from another person.” Through these institutions, Sasi establishes a framework of social regulation that promotes trust, mutual respect, and collective responsibility among community members.

The ecological dimension is expressed through the mechanisms of opening and closing Sasi, which provide sufficient time for natural resources and cultivated plants to reach optimal maturity before harvesting. The closure period is understood as an essential component of resource stewardship, during which growing plants and resources must not be disturbed so that they can achieve their full productive potential. This temporal regulation enables sustainable resource use while maintaining ecological balance and long-term productivity.

The moral dimension is reinforced through customary rituals and spiritual sanctions that provide collective legitimacy to the rules governing resource use and social conduct. Rituals surrounding the implementation of Sasi are not merely ceremonial practices; they function as moral instruments that strengthen communal commitment to customary norms and obligations.

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These three dimensions operate simultaneously within every form of Sasi. For example, in the case of *Sasi Hasil Alam* (Natural Resource Sasi) applied to privately owned gardens, the ecological function is to allow crops to mature optimally before harvest. Socially, it serves to mark and respect property boundaries, while morally, violations are believed to carry spiritual consequences in addition to customary sanctions. Through this integration, Sasi functions as a comprehensive mechanism for governing social-ecological relationships.

As an informal legal institution, Sasi regulates property rights and addresses disputes through customary sanctions. These sanctions typically involve customary fines and social penalties intended not only to punish offenders but also to restore disrupted social relationships and provide collective learning opportunities for the wider community. One form of Sasi that remains particularly significant in the daily life of Negeri Piliana is *Sasi Pelanggaran* (Violation Sasi), which is specifically applied to address violations of social norms. The Raja[4] explained that community members remain reluctant to commit offenses because of the social consequences associated with violations, including customary fines and negative judgments from the broader community.

The enforcement of *Sasi Pelanggaran* involves the integration of customary authority, communal deliberation, and coordination with formal state institutions. When violations occur repeatedly, customary leaders convene broader community discussions to evaluate the social situation and determine appropriate responses. Customary fines are generally regarded as a measure of last resort, implemented only when persuasion and social reminders are no longer effective.

Importantly, customary sanctions do not end with the payment of fines. Offenders may also be required to undergo public social sanctions, such as being escorted around the village accompanied by the sound of *tifa* drums while wearing traditional attire and publicly expressing remorse. Such practices serve an educational function by reinforcing communal values and demonstrating the consequences of violating social norms.

In practice, the people of Negeri Piliana do not perceive customary law and state law as mutually exclusive systems. Rather, they are viewed as complementary mechanisms operating at different levels. State law is understood as addressing legal accountability, whereas customary sanctions focus on restoring social harmony and repairing community relationships. The primary responsibility for enforcing Sasi rests with the Saniri Negeri as the representative of customary

[4] Raja is a Village Head**.** In Maluku, a village is commonly known as a *Negeri*, a customary community and administrative unit governed through both formal and traditional institutions.

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authority, while the village government plays a supporting role by providing guidance and administrative assistance. The rituals associated with opening and closing Sasi further reinforce its moral legitimacy through spiritual means. Traditional Sasi ceremonies begin in the customary house with prayers recited in the Sopaa[5] language, followed by the planting of ceremonial spears and the sprinkling of sacred water. These rituals are accompanied by declarations that anyone who violates Sasi will bear the consequences of their actions.

The church also plays an important role in providing spiritual legitimacy. Christian prayers have been incorporated into the rituals surrounding the opening and closing of Sasi, and customary values are increasingly interpreted through Christian teachings concerning responsibility toward fellow human beings and God's creation. This integration reflects the adaptive capacity of Sasi to accommodate religious transformation while preserving its fundamental governance functions.

Spiritual beliefs associated with Sasi remain deeply embedded within the community. Violations of Sasi markers are believed to result not only in social sanctions but also in misfortune, illness, or other adverse consequences. If a violation is identified by the Kewang, the offender may additionally be subjected to customary fines in accordance with village regulations. Social change and the spread of Christianity have brought certain adjustments to ritual practices. In some cases, traditional Kewang rituals have been replaced by church-led ceremonies; water that was once blessed through customary incantations is now blessed by pastors, and in some contexts, the opening and closing of Sasi are conducted directly within church services as part of communal worship.

Individuals who violate Sasi are widely believed to experience tangible consequences, whether in the form of illness, misfortune, or moral accountability. This belief contributes to the perception that individuals who take resources unlawfully will eventually return what they have taken, either through customary fines, personal misfortune, or repentance. Consequently, community members often prefer to use the term "borrowing" rather than "stealing" when discussing such actions.

At a deeper level, Sasi functions as a normative system that shapes moral character within the community. It cultivates respect for land, recognition of the rights of others, and a sense of collective responsibility for environmental sustainability. The participation of customary leaders,

[5] The *Sopaa* language is commonly referred to by the people of Piliana as the "mountain language" (*bahasa gunung*), reflecting its widespread use among communities in the Manusela Highlands. Beyond its communicative function, the language serves as a cultural marker that reinforces a shared sense of identity, belonging, and historical continuity among the upland peoples of Seram.

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church leaders, and household heads in Sasi rituals creates a form of moral legitimacy that reinforces compliance across generations.

The capacity of Sasi to integrate social, ecological, and moral dimensions within a single governance framework demonstrates its significance as a living and adaptive social-ecological institution. Rather than functioning solely as a mechanism for resource regulation, Sasi serves as a comprehensive governance system that maintains ecological stewardship, social order, and moral cohesion within Negeri Piliana.

Dynamics of Pressures and Challenges

Within the framework of ecological management, understanding the factors that drive change in social-ecological systems is fundamental to designing adaptive, mitigative, and transformative management strategies. Chapin et al. (2009) distinguish two main categories of factors influencing change, namely *Driving Forces* (external pressures) and *Pressures* (internal pressures/internal stresses), which affect the dynamics of vulnerability, risk, and adaptive capacity within a system.[6] The Sasi system in Negeri Piliana exists in an unstable condition because it faces both external and internal pressures that operate simultaneously. These factors constitute systemic conditions that require adaptive responses in order to maintain the social and ecological functions of Sasi.

External pressures that act as driving forces of broader systemic change emerge in several forms:

- Climate change; uncertainty in rainfall patterns and seasonal cycles creates tangible physical disturbances. Continuous rainfall throughout the year results in crop failure, while prolonged drought damages soil structure and hinders planting activities over the long term.
- State conservation policies; the presence of Manusela National Park, the installation of boundary markers by the Forest Area Consolidation Agency (*Balai Pemantapan Kawasan Hutan*—BPKH), and the classification of areas as Convertible Production Forest (*Hutan*

[6] The concept of *Driving Forces* is used to explain the causal factors that drive changes in ecosystem conditions and the services they provide. The *European Environment Agency* (EEA), one of the European Union bodies concerned with environmental policy, defines driving forces as social, economic, and demographic factors that generate pressures on a system (European Environment Agency, 1999). Driving forces are not direct pressures; rather, they help shape the foundation of how a system responds to disturbances (Chapin et al., 2009). Chapin et al. (2009) further explain that *Pressures* refer to conditions directly experienced by a system, whether in the form of external hazards or internal stresses. While driving forces are structural in nature, pressures are concrete events that affect the day-to-day functioning of a social-ecological system.

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Produksi Konversi—HPK) are perceived as threats to customary living space. This creates legal uncertainty regarding *petuanan* territories, which serve as the primary setting for the implementation of Sasi.

- Market and economic integration; dependence on external markets causes instability in the prices of agricultural products, as local vegetable prices decline when supplies from Masohi are abundant. Dependence on external inputs, such as spinach and water spinach seeds obtained from Masohi, also leads to delays in planting seasons when distribution is disrupted.
- Migration; migration for employment or education outside the village reduces the space and time available for the internalization of customary values, ultimately leading to the erosion of these values among younger generations.

Internal pressures, or *internal stresses*, emerge from within the community and directly affect the adaptive capacity of the people, including:

- The weakening of traditional ecological knowledge; the transmission of oral knowledge concerning environmental indicators and planting cycles has begun to decline due to migration and the limited interaction of young people with the environment of the negeri.
- A crisis in the use of the customary language; most younger generations no longer understand the Sopaa language, even though this language serves as an element of symbolic authority used in nearly all Sasi rituals.
- Changes in social values; there has been a shift from collective values toward individualism, whereby customary sanctions are increasingly regarded as less serious. Some younger people have also begun to separate customary consequences from religious beliefs, thereby weakening the spiritual deterrent effect of Sasi.
- A crisis of regeneration in customary activities; low youth participation in collective activities, particularly those related to customary practices, hampers regeneration within customary institutions and activities. Economic factors exert a strong influence, as participation is often measured in terms of material rewards rather than customary service and commitment.

These pressures create a context of change that compels the Sasi system to continuously modify and expand its functions in order to remain relevant in maintaining the relationship between the people of Negeri Piliana and their environment and customary territory.

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Adaptive Responses and Transformation of the Sasi System

Sasi functions as a social-ecological mechanism that enables the people of Negeri Piliana to respond to changes occurring around them. By responding to these changes, the Sasi system remains a dynamic institution that continuously adapts to various pressures. The transformation resulting from this adaptation includes profound changes in the structure, functions, and understanding of the system in order to address the pressures it faces.

One of the most significant forms of transformation is the expansion of Sasi's function from merely a conservation instrument into a political-ecological instrument for defending customary land rights. This can be seen in one form of Sasi known as *Sasi Penolakan* (Rejection Sasi), a customary mechanism used to express collective opposition to external threats, such as the installation of HPK boundary markers in Piliana, which are perceived as violating the boundaries of community gardens. Unlike *Sasi Hasil Alam* (Natural Resource Sasi), which regulates harvesting periods, *Sasi Penolakan* functions as a political tool for reclaiming environmental governance based on customary law when state policies threaten the community's living space.

Along with changes in social values and the demands of formal legal systems, Sasi has undergone adjustments in its enforcement mechanisms. Forms of physical punishment that are considered severe and no longer consistent with humanitarian values, such as the practice of holding a heated machete (*mancadu*), have been abandoned. In their place, sanctions have shifted toward more symbolic forms that nevertheless carry strong social consequences, such as being paraded around the village accompanied by the sound of *tifa* drums while wearing traditional attire. This adjustment demonstrates that the normative system of Sasi remains active and capable of adapting to changing times without losing its essential function of maintaining social order within the community.

In terms of knowledge transfer, the church also plays an important role in bridging the gap in the internalization of customary values among younger generations. Local values and responsibilities toward the environment are integrated into religious education, while the church provides spiritual legitimacy through prayers and blessings during the opening and closing ceremonies of Sasi. In addition, the customary deliberation mechanisms conducted by the Saniri and Kewang serve as crucial forums for social learning. Through these institutions, the community does not merely react to pressures but actively evaluates and renegotiates Sasi regulations to ensure their continued relevance. Collective decision-making ensures that the burden of adaptation is not borne by individuals separately, but rather through strong institutional coordination that connects cultural values with practical actions in the field.

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Sustainability and Community Resilience

Sustainability in Negeri Piliana is the result of a dynamic interaction between adaptive capacity, resilience, and transformation rooted in local values. In this context, Sasi is understood as an ancestral legacy that embodies a collective responsibility toward both the community and the environment.

In Negeri Piliana, the revitalization of Sasi is strengthened through benefit-sharing mechanisms, as demonstrated by the practice of *Asisan*[7] which serves as a key mechanism through which harvests are marked as social events that reinforce solidarity through collective cooperation after Sasi is opened. The application of Sasi to Village-Owned Enterprise (*BUMDes*) gardens reflects a relevant form of institutional adaptation. Sasi is applied to BUMDes gardens to protect the quality of horticultural products (such as water spinach and spinach) until they reach the appropriate time to be sold in external markets. This benefit-sharing mechanism and protection of village assets create a positive feedback loop; when community members experience direct economic benefits, the motivation to maintain the Sasi system as a means of sustaining collective life becomes increasingly stronger.

Despite experiencing transformation and pressures, particularly those associated with modernity, the people of Negeri Piliana continue to uphold their identity through obedience to the mandates of previous generations. Core principles, such as the prohibition against harvesting resources before the designated time and the mechanism of opening and closing Sasi, continue to be practiced with the belief that, “There have been no changes to Sasi; we carry it out according to the legacy of our ancestors.” Sasi functions as both an identity and a customary heritage that connects the community to their ancestral land and family history. Although its rituals have adapted—from ancestor veneration to church-based prayers—the essence of the institution remains intact. The ability of the system to transform without losing its fundamental principles demonstrates a high level of resilience, whereby Sasi continues to regulate social order and community morality.

The long-term sustainability of Sasi is largely determined by the creation of harmony among cultural values, customary regulations, and ecological conditions that mutually reinforce one another. Cultural values teach that nature is a moral entity that must be respected; customary regulations translate these values into concrete obligations; and ecological conditions provide tangible feedback regarding the success of these practices.

[7] *Asisan* refers to a form of cooperation and social solidarity carried out collectively through mutual assistance after Sasi has been opened.

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When these three dimensions exist in harmony, Sasi functions as a robust social-ecological governance mechanism. Adaptive governance involving the synergy of customary institutions (Saniri and Kewang), the church, and the village government serves as the primary foundation of community resilience. Through customary deliberation forums, Sasi regulations are continuously renegotiated to remain adaptive to climate change and market dynamics without compromising the core function of the system in safeguarding the well-being of future generations. Ultimately, the resilience of the people of Negeri Piliana lies in the ability of the Sasi system to continuously transform and absorb disturbances amid historical uncertainties, while maintaining a balanced relationship between the community and its environment.

CONCLUSION

This study reveals that Sasi in Negeri Piliana functions as an integrative social-ecological governance mechanism. Through the integration of social, ecological, and moral dimensions, Sasi serves not only as an instrument for natural resource management but also as a means of maintaining a balanced relationship between the community, the environment, and the values that sustain their collective life. Customary norms and authority structures provide a framework for social regulation, resource-use management supports ecological sustainability, while rituals and customary values provide moral legitimacy for its implementation. The integration of these three dimensions positions Sasi as a tangible form of governance capable of uniting the social, ecological, and spiritual lives of the people of Negeri Piliana within a cohesive management mechanism.

In the context of responding to pressures, this study demonstrates that Sasi provides a normative framework that enables communities to maintain access to and control over natural resources based on customary land rights. External pressures in the form of conservation policies, such as the establishment of Manusela National Park and the designation of Convertible Production Forest (HPK) areas, climate change that disrupts seasonal patterns and harvest yields, as well as market dynamics that create instability in agricultural commodity prices, are all addressed by the community through the mechanisms of Sasi. At the same time, internal pressures, including declining participation of younger generations in customary activities, the weakening transmission of local ecological knowledge due to migration, the shift from collective values toward individualism, and the decreasing use of the Sopaa language among younger generations, are also addressed through institutional and normative adaptations that continue to evolve. These findings confirm that system resilience is not built through efforts to control all

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forms of change, but rather through the community's ability to continuously adapt and develop appropriate responses to those changes.

The sustainability of the Sasi system in Negeri Piliana is understood as the result of the interaction between adaptive capacity, resilience, and transformation. Adaptive capacity enables the community to respond to and shape change through various social, institutional, and cultural innovations. The resilience of the Sasi system in Negeri Piliana does not lie in its ability to maintain a fixed form, but in its capacity to preserve its core functions through various processes of adjustment and renewal. Sasi provides a mechanism through which the community can continuously learn, adapt, and collectively reorganize its resources. The transformation of Sasi from an instrument for managing natural resources into a social-ecological governance system encompassing the protection of customary territories, moral education, the regulation of relationships among community members, and the foundation of collective identity demonstrates that sustainability depends not only on the ability to endure but also on the capacity to create new forms that remain rooted in the values and identity of indigenous communities.

The common thread that connects all of these dynamics is social memory. The people of Negeri Piliana possess a collective memory of how Sasi was practiced by their ancestors, how its rules were enforced, and how the system recovered from periods of crisis. This memory serves as the *seeds of renewal* that enable the system to regenerate after experiencing disturbances. When cultural values, customary regulations, and ecological conditions exist in harmony, the Sasi system is able to maintain resilience and long-term sustainability. The resilience of the people of Negeri Piliana lies in the capacity of a social-ecological system that is guided by cultural values, strengthened by customary institutions, sustained by social solidarity, and tested by ecological and historical dynamics, to continue transforming without losing its identity.

This study also identifies that the revitalization of Sasi is an adaptive process that strengthens the capacity of customary institutions to remain relevant within changing socio-economic contexts. The potential for revitalization rests upon three main pillars: the strengthening of customary institutions through the synergy of the Saniri, Kewang, Raja, Church, and village government in forming adaptive governance; the implementation of local norms through the adaptation of customary values and regulations that respond to contemporary pressures without losing their essential character; and the equitable distribution of benefits through the *Asisan* mechanism.

At the most fundamental level, Sasi in Negeri Piliana demonstrates that sustainability is the capacity of a social-ecological system to continuously adapt and reorganize collective

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resources without losing its identity. These findings have the potential to encourage the recognition and strengthening of customary institutions in the governance of forests and indigenous living territories, while also serving as a reference for the development of social forestry policies and community participation in conservation based on local wisdom. Thus, this study not only contributes to scientific understanding of the role of Sasi as a social-ecological mechanism, but also supports more equitable and sustainable social transformation for indigenous communities in Maluku and other regions facing similar challenges.

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