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Human and Nature in Indonesia-Maluku
Heritage to Protect Environment in Luang Island

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ABSTRACT

This dissertation examines the practice of *Hygeralai* as a representation of the Traditional Ecological Knowledge (TEK) system. The study specifically focuses on five main dimensions, namely cognitive-linguistic, socio-cultural, historical, and ecological aspects, using the Multiple Evidence Base (MEB) framework. The research location is on Luang Island, a small outer island in Maluku Province, Indonesia, inhabited by a coastal indigenous community whose livelihood is highly dependent on marine resources. The main objective of this research is to examine how the *Hygeralai* system influences the ecological cognition of the Luang community and their communication style using elements of the marine ecosystem. Exploring how traditional institutional roles function within *Hygeralai* practices. How the historical emergence of *Hygeralai* occurred and its impacts on the marine ecosystem. Additionally, this study aims to assess social-ecological resilience capacity and changes resulting from interactions with formal institutions such as churches and government programs.

In terms of methodology, this study applies a qualitative-ethnographic approach with data collection techniques in the form of participatory observation, in-depth interviews, and a review of local historical documents. In addition, the Geographic Information System (GIS) method is used to map the *Hygeralai* area spatially and analyze patterns of marine resource use by the local community. To understand the socio-ecological dynamics, the adaptive renewal cycle and panarchy frameworks were used, along with the TEK and adaptive co-management approaches to examine the relationship between local knowledge, traditional institutional structures, and natural resource management strategies.

The results of this study show that, from a cognitive and linguistic perspective, *Hygeralai* shapes the ecological mindset of the Luang community, as reflected in the way they name, classify, and navigate marine areas using local language, idioms, and a directional system based on natural phenomena. This reflects the close relationship between language, environment, and the cognition of coastal communities. From a socio-cultural perspective, *Hygeralai* functions as a traditional socio-ecological management system involving traditional social structures such as village heads, luwu heads, saniri, and marinyo. This system establishes rules, prohibitions, and sanctions, as well as strengthening social solidarity and community resilience in the face of ecological crises.

Historically, *Hygeralai* emerged from the local cosmology of the Luang community and underwent significant evolution after the introduction of Protestant Christianity.

This transformation demonstrates the traditional system's ability to adapt and negotiate with new values, forming a hybrid environmental management system that combines traditional customs and religious institutions. Ecologically, *Hygeralai* has a tangible impact on the sustainability of marine ecosystems, particularly in maintaining the populations of high-value species such as sea cucumbers, lola, and kima. However, this system also faces pressures from internal factors (shifting values, weak customary authority) and external factors (illegal fishing, climate change, marine pollution). Analysis within the adaptive cycle and panarchy frameworks indicates that *Hygeralai* has the capacity to adaptively transform in the face of various challenges.

This research contributes to strengthening understanding of the importance of local knowledge such as *Hygeralai* in inclusive and sustainable natural resource management. The MEB approach allows for the recognition of epistemic equality between local and scientific knowledge, and provides a strong theoretical basis for community-based policy development. On the academic side, this research enriches studies in the fields of environmental anthropology, TEK, and socio-ecological systems, and paves the way for the integration of local knowledge into a more equitable and contextual resource management framework, particularly on the outer islands of Maluku and Indonesia.

ABSZTRAKT

A disszertáció a *Hygeralai* gyakorlatát, mint a hagyományos ökológiai tudás (Traditional Ecological Knowledge-TEK) rendszerének reprezentációs formáját vizsgálja. Az értekezés elsősorban négy dimenzió tanulmányozására-kognitív-nyelvi, szociokulturális, történelmi és ökológiai - összpontosít a többszörözött bizonyítási eljárásokon alapuló (Multiple Evidence Base - MEB) megközelítés keretein belül. A kutatást az indonéziai Maluku tartományban található Luang-szigeten, egy kicsi, a szigetvilág külső övezetéhez tartozó szigeten végeztük, és ahol az őslakos tengerparti közösség megélhetése nagymértékben a tengeri erőforrásoktól függ.

A kutatás fő célja annak az elemzése, hogy a *Hygeralai*-rendszer hogyan befolyásolja a Luang közösség ökológiai világképét és a tengeri ökoszisztémákkal kialakult „kommunikatív” kapcsolatukat. Az értekezés a hagyományos intézmények működését kifejezetten a *Hygeralai* gyakorlatokon keresztül belül vizsgálja, tanulmányozva ezáltal a rendszer történeti fejlődését és ökológiai hatásait. Az elemzés emellett vizsgálja a közösség társadalmi-ökológiai rezilienciáját, illetve azokat a változásfolyamatokat, amelyek a formális intézményekkel, például az egyházakkal és a kormányzati programokkal való találkozás következményei.

Módszertanilag a dolgozat kvalitatív etnográfiai megközelítést alkalmaz, részvételi megfigyeléssel, mélyinterjúkkal és a helyi történelmi dokumentumok áttekintésével. A szöveg a Hygeralai területek pontos térbeli meghatározása és a tengeri erőforrások használatának elemzése érdekében a földrajzi információs rendszereket (GIS) is használta. A társadalmi-ökológiai dinamika tanulmányozása érdekében a kutatás az adaptív megújulási ciklus és a panarchia megközelítést alkalmazza a TEK és az adaptív gazdálkodási szempontok mellett azért, hogy feltárja a helyi tudás, a hagyományos intézményi struktúrák és a természeti erőforrásokkal való gazdálkodási stratégiák közötti kölcsönhatást.

Az eredmények azt mutatják, hogy kognitív-nyelvészeti szempontból a *Hygeralai* formálja a Luang közösség ökológiai világképét, ami a tengeri területek elnevezésében, osztályozásában és a térben történő tájékozódási gyakorlatban egyaránt megnyilvánul, és amit a helyi nyelv, az idiómák és a természeti jelenségeken alapuló tájékozódási rendszerek alapoznak meg. Mindez a tengerparti közösségek esetében a nyelv, a természeti környezet és a kognitív megismerési folyamatok kölcsönös függési kapcsolatviszonyait bizonyítja.

Társadalmi-kulturális szempontból a *Hygeralai* hagyományos társadalmi-ökológiai irányítási rendszerként működik, amely felöleli a társadalmi struktúrákat, beleértve a falu vezetését, a *luwu* vezetőt, a *sanirit* és a *marinyót*. Ezek az intézmények szabályokat, tilalmakat és szankciókat érvényesítenek, miközben erősítik a társadalmi szolidaritást és az ellenálló képességet az ökológiai működési zavarok közepette. Történetileg a *Hygeralai* a helyi kozmológiából eredeztethető és a protestáns kereszténységnek a helyi közösségben történő elterjedését követően jelentős átalakuláson ment keresztül. Ez az átalakulás jól szemlélteti a rendszernek a külső hatásokhoz való alkalmazkodási képességét, ami végül egy olyan hibrid környezetvédelmi szabályozási modellt eredményezett, amely integrálja a hagyományos szokásokat a vallási intézmények működésébe. Ökológiai szempontból a *Hygeralai* jelentősen hozzájárul a tengeri élővilág fenntarthatóságához, különösen az olyan értékes fajok populációinak megőrzésével, mint a tengeri uborka, a *lola* (*Trochus niloticus* -tengeri csiga), az abalone (*Haliotis spp.*–tengeri fülcsiga) és a bia kima (*Tridacna gigas*-óriáskagyló). Mindazonáltal a rendszerre egyre nagyobb nyomás nehezedik a belső változásdinamika (pl. változó kulturális értékek, meggyengült szokásjog) és a külső erők (pl. illegális halászat, éghajlatváltozás, tengerszennyezés) miatt. A ciklikus alkalmazkodás és a panarchia keretrendszerének felhasználásával végzett elemzés azt sugallja, hogy a *Hygeralai* megőrizte az alkalmazkodási képességét a fentiekben említett sokrétű kihívásokra adott válaszként.

A disszertáció alapjául szolgáló kutatás elősegíti az olyan helyi tudásrendszerek, mint a *Hygeralai*, szerepének megértését a befogadó és fenntartható erőforrás-gazdálkodásban. A MEB elemzési keretrendszer elősegíti a helyi és a tudományos tudás közötti episztemiológiai egyensúly elismerését és szilárd elméleti alapot nyújt a közösségi szempontú szakpolitika-fejlesztéshez. Tudományos szempontból az értekezés hozzájárul a környezeti antropológiához, a TEK „tudomány” és a társadalmi-ökológiai rendszerek kutatásához, miközben az őslakosok tudásának a méltányos és kontextus-specifikus gazdálkodási stratégiákba való integrálására irányuló erőfeszítéseket is támogatja, különösen Maluku és Indonézia külső szigeteinek vonatkozásában.

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1. INTRODUCTION

Human life is highly dependent on biodiversity and ecosystem services that support food security, availability of clean water, climate stability, and overall environmental health. However, in recent decades, the global biodiversity crisis has continued to worsen. The Global Assessment Report on Biodiversity and Ecosystem Services, published by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), revealed that more than one million species are threatened with extinction in the near future (IPBES, 2019). Habitat loss due to land conversion, urbanization, deforestation, and ecosystem degradation constitutes the primary cause of these threats. This threat is further exacerbated by additional factors such as climate change, overexploitation of natural resources, pollution, and the spread of invasive species, as highlighted in the Thematic Assessment on Invasive Alien Species and Their Control, also released by IPBES (Helen et al., 2023).

Furthermore, this condition is inextricably linked to the climate crisis, which has been extensively examined by the Intergovernmental Panel on Climate Change (IPCC). In various recent IPCC reports, global warming is identified as a major threat to ecosystem stability and human well-being. These ecological pressures are exacerbated by rapid population growth (Emerton, 2020; IPCC, 2023), urgent economic demands (Castronuovo, 2024), as well as large-scale exploitation of natural resources, both on land and in the ocean (Raihan, 2024), alongside levels of pollution resulting from industrialization, which also contribute significantly to environmental degradation. One of the underlying root causes of this crisis is the dominance of an anthropocentric worldview a paradigm that places humans at the centres of the planetary system (Steffen et al., 2011; Moran, 2017). Indeed, humans are not the only actors on Earth, but rather a part of an interconnected system of life (Capra, 1984; Tiberius, 2008; Di Paola, 2024). Therefore, a paradigm shift toward an ecological ethics approach is necessary—one that demands humans to demonstrate moral responsibility in the management of natural resources and the environment (Dearing et al., 2015).

In response to this crisis, the IPBES report calls for urgent action through structural policy changes, the implementation of sustainable economic principles, and the recognition of traditional ecological knowledge in biodiversity management. Governments across various countries and the private sector have begun to respond by developing strategies that integrate sustainability

principles. Long before the emergence of formal policies, indigenous communities around the world have developed local practices that have proven effective in maintaining ecosystems. Traditional values, such as the ancient Indonesian proverb "*di mana kaki menyentuh bumi, di sanalah langit dijunjung*" (where the feet touch the earth, there the sky is upheld), reflect a way of life harmonized with the environment. This refers to the global ecological principle expressed in the saying "When in Rome, do as the Romans do". Both proverbs emphasize the importance of adaptation, respect for nature, and the application of local ethics in human interactions with the environment.

It is important to emphasize that many communities who directly depend on natural resources for their livelihoods have developed informal regulatory systems in the form of social norms and customary rules rooted in their local culture. This framework functions as a collective self-regulatory mechanism for the responsible exploitation and management of natural resources.

The emergence of these informal institutions represents a significant response arising from deep ecological understanding and first-hand experiences of declining quality and availability of natural resources. This phenomenon aligns with the resource depletion crisis model proposed by Berkes and Turner within the Social-Ecological Systems (SES) framework, which emphasizes that excessive pressure on natural resources, can lead to depletion, ultimately resulting in both ecological and social crises. The model illustrates the complex dynamics of human–environment interactions, particularly in the context of overexploitation (Berkes & Turner, 2006). As a historical example, the community regulation system of the Székely in Hungary, which was in place from the 15th to the 19th century, demonstrates a form of social adaptation through restrictions on the use of communal resources, aimed at ensuring intergenerational sustainability (Molnár et al., 2015).

Furthermore, many indigenous communities whose livelihoods depend on natural resources particularly marine ecosystems—actively participate in the management of these resources and the environment based on traditional knowledge systems. Such practices are evident across various regions and localities, including villages Sasa (Fong, 1994), Solomon Islands and Vanuatu (Johannes, 1998), New Zealand (Ballantine, 1999) , Brazil (Anaya & Espírito-Santo, 2018) , Oceania (Aswani Canela, 2011) , dan Indonesia (Brouwer, A., 1996; Harkes., 2000; Bagir et al., 2021). Although the population of indigenous communities accounts for only about 6% of the global human population, these communities manage or have tenure over approximately 25% of

the world's land surface, encompassing a significant proportion of remaining intact ecosystems and biodiversity hotspots (World Bank Group, 2023). They actively participate in and bear responsibility for conserving approximately 80% of the Earth's biodiversity.

According to data from World Population Review (WPR) as of April 2024, Indonesia's population is recorded at 279,390,258 people, making it one of the world's largest island nations in terms of population. Geographically, Indonesia is divided into 38 provinces, including eight provinces whose entire territories consist of islands. The country is renowned for its high ethnic and cultural diversity, with approximately 1,340 ethnic groups and 718 regional languages spoken across the archipelago. Around 70% of Indonesia's territory is maritime waters, while the remaining 30% is land area. Consequently, a significant portion of the world's marine species can be found in Indonesian waters (Randall, 1998; Roberts et al., 2002). Indonesia is home to more than 17,500 islands, including 111 outermost small islands. (Joseph, 2023; Kementerian Kelautan dan Perikanan Republik Indonesia, 2017; Kementerian Koordinator Bidang Kemaritiman dan Investasi Republik Indonesia, 2020), and shares borders with ten countries, both on land and at sea. Outermost small islands ¹ Defined as islands with an area not exceeding 10,000 km² (Bakosurtanal, 2007; Hastuti et al., 2007; Pemerintah Republik Indonesia, 2017). These islands have base point coordinates that form part of the archipelagic baseline, as stipulated within the framework of international law (United Nations Oceans and Law of the Sea, 1982; St. Korowicz, 1986) even national (Hamzah, 1984; Arsana, 2007; Kapur, 2019). In the context of national policy, these areas are categorized as Certain National Strategic Areas (*Kawasan Strategis Nasional*

¹ Outermost Small Islands (Pulau-Pulau Kecil Terluar / PPKT) are an essential part of the sovereign territory of the Unitary State of the Republic of Indonesia and hold strategic importance in terms of geopolitics, national defense, and natural resource management. According to Presidential Regulation No. 78 of 2005, outermost small islands are defined as "small islands located in border areas and/or at the outermost parts of the Unitary State of the Republic of Indonesia that directly border other countries." This definition highlights the crucial role of these islands not only in determining national boundaries but also in strengthening Indonesia's maritime jurisdiction and geopolitical presence in both regional and international waters. This definition emphasizes the critical role of outermost small islands (Pulau-Pulau Kecil Terluar / PPKT) as markers of national sovereignty boundaries, as well as reference points in determining the archipelagic baseline for the delimitation of Indonesia's maritime zones, in accordance with international maritime law. Generally, the category of "small islands" refers to islands with an area of less than or equal to 10,000 km², as stipulated under Law No. 27 of 2007 concerning the Management of Coastal Areas and Small Islands, as amended by Law No. 1 of 2014. In this context, outermost small islands such as Luang Island serve not only as territorial assets and strategic defense outposts for the state but also as living spaces for coastal and indigenous communities who maintain local resource management systems rooted in traditional ecological knowledge, such as the Hygeralai practice. Although the governance of PPKT is legally under state authority, the presence of indigenous communities and their culturally-based management systems highlights the importance of an integrative approach that recognizes and incorporates local participation in safeguarding Indonesia's frontier territories.

Tertentu / KSNT) regions that hold strategic significance in terms of state sovereignty, environmental management, and the preservation of world heritage sites. As such, their development is prioritized to support the national interests of the Republic of Indonesia (Sprintall, 2009; Hendrapati, 2014; Hall, 2019; Marewa & Parinussa, 2020; Widiyanta, 2020). In this regard, the governance of marine resources in Indonesia remains predominantly guided by formal approaches rooted in modern science, which continues to shape conservation policies and interventions. While these approaches provide a strong technical framework, they often overlook indigenous knowledge systems that have long been practiced by coastal and indigenous communities as part of sustainability strategies grounded in lived experiences. In fact, in many island regions such as Maluku, local practices like *Hygeralai* have proven to play a crucial role in collectively regulating access, harvesting seasons, and the protection of sensitive marine zones. (Sukuryadi, 2023).

The sea plays a highly significant and multidimensional role in the lives of Indonesia's coastal communities. As the world's largest archipelagic nation, comprising more than 17,000 islands, Indonesia possesses a coastline stretching over 95,000 kilometers and is endowed with abundant marine resources—ranging from rich biodiversity and fisheries potential to profound cultural and economic significance for local populations. In many coastal regions, particularly in archipelagic areas such as Maluku, the sea is more than just a source of food and livelihood. For Indonesia's coastal communities, the sea constitutes a living space—not merely a place to earn a living, but also the domain in which collective identities are born and developed. Activities such as fishing, collecting shellfish and sea cucumbers, and cultivating seaweed are integral parts of daily life, carried out using knowledge passed down through generations. In Maluku, known as the "archipelago province" with more than 1,300 islands, the sea serves as a connecting route between islands, a source of both subsistence and commercial livelihoods, and a rich cultural and ritual space. Indigenous communities in Maluku, such as those on *Luang Island*, *Seram*, *Kei*, and *Tanimbar*, possess ecological knowledge systems embodied in local practices like *Sasi*, *Hawear*, and *Hygeralai* customary prohibitions based on seasons, zones, and spiritual values that regulate the collective and sustainable use of marine resources.

This phenomenon aligns with the paradigm of contemporary environmental anthropology, which holds that the relationship between humans and the environment cannot be separated from

its social, cultural, and symbolic contexts. Within this framework, communities are not merely resource users, but integral components of complex and dynamic socio-ecological systems.

As explained by Berkes, Folke, and Gadgil (1995), traditional ecological knowledge such as that possessed by indigenous communities is a manifestation of cultural resilience and ecological adaptation to environmental change. This approach also recognizes that local practices have the capacity to shape ecological sustainability, not only through technological means, but also through embedded values, beliefs, and social structures within the community (Sukuryadi, 2023).

Luang Island is one of the indigenous communities included in the list of Indonesia's 111 outermost islands. Located near the border with Timor-Leste to the west and directly adjacent to Australia to the south, the island lies at the geographic.

Hygeralai is a local knowledge system of the Luang community, consisting of a set of principles, norms, and resource management strategies oriented toward the sustainable use and conservation of both natural resources and the environment. As a local institution, *Hygeralai* regulates the utilization of natural resources through a codified set of rules and practices that have become deeply internalized within the community's daily life. This system is specifically applied to marine resource management, which, in the context of *Luang Island*, is understood as communal property resources provided by nature and collectively owned by the community.

In the *Hygeralai* system, the principle of communal or collective ownership is a prominent feature, as marine resource management is based on customary rights and regulations shaped by local cultural values, including traditional tenure systems. In addition, the social structure of the community including positions, roles, and caste backgrounds plays a crucial role in determining the distribution of authority and responsibilities within this traditional institution. Therefore, *Hygeralai* functions not only as an ecological management mechanism but also reflects an organized customary-based social order within the life of the *Luang Island* community.

The rules within the *Hygeralai* system are unwritten and rooted in conventions passed down through generations. On *Luang Island*, this system serves as the foundation for marine resource governance, guided by locally recognized principles accepted by the community. One of its key applications is the regulation of harvesting periods for *nyawi* (*Sea cucumbers*), which is restricted through a rotational open-close system applicable across all shallow water areas of the island. Under certain circumstances, such as urgent community needs for instance, to support

religious events or village affairs these rules may be adjusted, allowing harvesting to begin earlier than originally stipulated.

Within the *Hygeralai* system, various provisions regarding rights and responsibilities govern the decision-making process, dissemination of information, and enforcement mechanisms. These include rituals accompanying the practice, communication media used to convey regulations, the right to sell marine products, the parties involved as participants, and sanctions imposed on rule violators. Furthermore, the rules also specify the types of fishing gear permitted during harvesting activities

Research on environmental and marine resource governance by indigenous communities on *Luang Island* remains extremely limited. This scarcity is largely due to geographical constraints *Luang Island's* remote location and limited transportation access which has resulted in a lack of systematically documented information. Most existing studies have focused broadly on fisheries, such as marine ecosystem surveys, species inventories, and political issues related to border defense and national security.

The most recent study specifically addressing marine resource management on *Luang Island* was conducted by Pannell in 1997, with a primary focus on economic and political aspects. In his research, Pannell analysed several key issues, including the origin of the term *Hygeralai* and the role of local actors in organizing the system. However, it was observed that Pannell primarily used the term *sasi* a customary practice terminology originating from other regions of Maluku to refer to the local resource management practices. Notably, *sasi* is not a term native to *Luang Island* itself, but rather one borrowed from external cultural contexts.

From the perspective of contemporary environmental anthropology, it is essential to understand that natural resource management systems are deeply contextual and cannot be separated from the social, cultural, historical, and geographical dynamics of the local community. For instance, *Luang Island* possesses a unique historical background that underpins the emergence of *Hygeralai* a community-based marine resource management system rooted in long-term ecological experiences. The island's social structure and traditional governance system also exhibit significant differences when compared to other regions in Maluku, as do its geographical conditions and the characteristics of its marine resources. These variations reflect how each indigenous community develops distinct approaches to respond to their environment and shape socio-ecological institutions that align with local needs and realities.

In general, the foundational principles of customary-based resource management systems around the world do exhibit certain similarities, such as the establishment of no-take zones, seasonal restrictions, and access rights regulation. However, the underlying rationales for implementing these principles are heavily shaped by local contexts. Diverse cultural values, social norms, ecological experiences, and societal structures give rise to distinct management practices that, while appearing similar on the surface, often differ fundamentally in meaning, mechanism, and purpose.

Therefore, contemporary environmental anthropology emphasizes the importance of recognizing local diversity as a key to comprehensively and equitably understanding indigenous sustainability practices. Unfortunately, in several external studies, there remains a tendency to generalize local practices across Maluku such as the widespread use of the term *Sasi* to represent all forms of traditional resource management. Such homogenizing approaches overlook local complexity and risk reducing indigenous knowledge to a single framework that fails to reflect the actual socio-ecological realities experienced by communities like those on *Luang Island*.

Furthermore, *Hygeralai* can be understood as both an integrative framework and a regulatory instrument that guides collective action toward sustainable marine resource management within a complex social-ecological system (SES). According to Merriam-Webster (2004), a SES is defined as an ecological system intricately linked and interacting with one or more social systems. As a living customary practice within the community of *Luang Island*, *Hygeralai* can be more deeply understood through the lens of traditional ecological knowledge (TEK) and the SES framework.

From a TEK perspective, as articulated by Berkes, traditional ecological knowledge is the result of accumulated knowledge, practices, and belief systems developed through long-term adaptation to both environment and culture, and transmitted across generations by indigenous and local communities. In this sense, *Hygeralai* represents not only a set of rules governing resource use, but also a dynamic body of knowledge embedded within the islanders' lived experiences and their reciprocal relationship with the marine environment (Berkes, 2017).

This is further emphasized by Colding and Folke, who state that local knowledge systems reflect communities' understanding of ecological cycles, seasons, and the relationship between humans and nature (Colding & Folke, 2001). In addition, Molnár and Babai emphasize that TEK also encompasses the restoration and sustainable monitoring of natural resources and biodiversity

(Zsolt & Babai, 2021). *Hygeralai* is not merely normative and ritualistic in nature, but also serves as a local mechanism for natural resource management, particularly marine ecosystems such as sea cucumbers (teripang) and other marine resources.

Meanwhile, Ostrom emphasizes the integration of social structures, traditional institutions, and local ecological dynamics as integral elements within a broader social-ecological system (SES), highlighting the interplay between governance systems and environmental sustainability (Ostrom, 2009). *Hygeralai*, as part of a social-ecological system, also reflects the SES framework developed by Ostrom. Practices such as *Hygeralai* meet the criteria of a complex system involving interactions between actors (local communities), resources (marine ecosystems and fishery products), governance structures (customary rules and prohibitions), and the biophysical environment (the waters surrounding *Luang Island*). Furthermore, this informal institution includes monitoring mechanisms, social sanctions, and the capacity to adapt to seasonal changes or external pressures all of which enhance the resilience of the system (Bennet, 1976).

This informal institution also includes monitoring mechanisms, social sanctions, and adaptive capacities in response to seasonal changes or external pressures all of which contribute to the resilience of the system. Thus, *Hygeralai* can be categorized as a form of TEK and simultaneously as part of a local SES in the management of marine resources and ecosystems, while also preserving the cultural identity of the Luang community. This perspective helps explain why customary practices like *Hygeralai* remain significant not only as cultural traditions, but also as relevant resource management strategies in contemporary environmental governance.

Within this framework, TEK is viewed as the accumulated result of local communities' experiences and observations, passed down through generations. It reflects an in-depth understanding of ecosystems, natural cycles, and sustainable resource management strategies. TEK also encompasses spiritual, ethical, and social values that shape a community's worldview and relationship with nature. Therefore, examining TEK within the context of environmental anthropology allows for a deeper understanding of human adaptation dynamics in relation to the environment, as well as the importance of preserving indigenous knowledge in efforts to conserve ecosystems and maintain the cultural resilience of local communities.

TEK is an integral component of environmental anthropology, as both fields examine the relationship between humans and their environment within social and cultural contexts. Environmental anthropology, as articulated by Julian Steward through his cultural ecology theory,

emphasizes that human adaptation to the environment is a process of cultural evolution shaped by ecological conditions and available technologies. Steward argued that while the natural environment imposes certain constraints, human culture actively determines how people adapt to these conditions making TEK not only a repository of ecological insight, but also a dynamic expression of cultural resilience and environmental stewardship (Steward, 1990).

This approach is further expanded by Roy Rappaport, who emphasizes the importance of symbolic systems and rituals in regulating ecological relationships. He demonstrates that resource management is often carried out through social structures and belief systems, highlighting how cultural practices particularly religious and ritualistic elements play a central role in maintaining ecological balance and ensuring sustainable interactions between humans and their environment (Rappaport, 1968). John Bennett adds the perspective that culture is inherently flexible and emphasizes the crucial role of human agency in responding to ecological change. He introduces the idea that humans are not merely passive recipients of environmental forces, but active agents who make strategic choices in adapting to their surroundings. This view underscores the capacity of communities to innovate, modify practices, and reshape cultural norms in response to shifting ecological conditions highlighting the dynamic interplay between culture and environment (Bennet, 1976). Emilio Moran also emphasizes that the interaction between humans and the environment is dynamic and complex, requiring a multidisciplinary approach that integrates ecology, anthropology, geography, and other social sciences. His work highlights the need to understand environmental change through both biophysical processes and human dimensions including cultural practices, economic behaviors, and social institutions to develop comprehensive insights into sustainable resource management and human adaptation strategies (Moran, 2017).

Based on the previous discussion, this study aims not only to analyze *Hygeralai* as an expression of local culture, but more deeply to position it as a traditional ecological knowledge system that holds epistemological and practical value within the context of marine resource conservation. Drawing on the MEB framework developed by Tengö, it is important to recognize that local knowledge systems must be respected in their own right, without being subordinated to formal scientific knowledge. Instead, they should be validated through their own internal mechanisms a process referred to as parallel validation. This approach emphasizes the coexistence of different knowledge systems on equal footing, allowing for a more inclusive, pluralistic, and

contextually grounded understanding of environmental management and conservation (Tengö et al., 2014, 2017). This principle is further reinforced in the IPBES Global Assessment Report (2019), which emphasizes the importance of epistemic pluralism in the production and integration of knowledge. Within this framework, *Hygeralai* as a form of TEK is not treated as a lesser or subordinate form of knowledge that must be validated through scientific methodologies. Instead, it is recognized as legitimate and contextually grounded knowledge that can directly contribute to the formulation of more equitable, inclusive, and sustainable marine resource management policies. Thus, *Hygeralai* represents one of many equivalent evidence systems alongside modern science, offering valuable insights for understanding, interpreting, and managing the relationship between humans and their natural environment.

1.1. Aims and Research Questions

This study examined four research questions (RQs). The four RQs correspond to the four factors. Panell (1978) conducted previous study on *Hygeralai*, focusing on its political and economic aspects. The study found that *Hygeralai* is managed by traditional institutions that possess complete jurisdiction and has a significant economic influence on local communities. At this point, no research has been conducted on *Hygeralai* with the specific objective of broadening its scope of study. Hence, this study aims to examine this subject in a comprehensive and thorough manner, including its cognitive and linguistic, socio-cultural, historical, ecological dimensions and as well how the dynamic of *Hygeralai* in SES and adaptive.

The present study is classified as fundamental research, aiming to analyze and investigate five RQs derived from the primary issues outlined in section 1. There are four RQs presented below. Every research question holds unique significance and relevance. Based on the previously stated claims of the underlying problems and conditions, a set of research questions developed. The initial research inquiries are:

1. RQ1: How does *Hygeralai* affect cognitive and linguistic aspects of Luang islanders?
- 1 RQ2: To what extent does *Hygeralai* work in social-cultural live of Luang islanders?
- 2 RQ3: What historical factors contributed to the rise of a local social movement against the implementation of *Hygeralai*?

- 3 RQ4: To what extent does *Hygeralai* impact the ecosystem of Luang Island's marine environment?, how the dynamic of *Hygeralai* in SES and adaptive?

1.2. Relevance Of The Research

By conducting an in-depth study of *Hygeralai* as part of Traditional Ecological Knowledge (TEK) which is focused on cognitive-linguistic, socio-cultural, historical, and ecological aspects this dissertation positions itself to answer various crucial issues in local-based natural resource management. This comprehensive approach to the social-ecological context is also clear evidence of the application of the MEB approach, in which local knowledge is recognised as a legitimate, equal and complementary source of information with scientific knowledge. By integrating local knowledge systems into academic analyses and natural resource governance, this research reinforces a fundamental principle of MEB, namely that diverse forms of knowledge can be combined collaboratively to address social-ecological challenges in a sustainable, inclusive and contextualised manner. This approach enables research contributions not only at the community level in practical dimensions, but also in the development of theoretical frameworks and scientific understanding in the fields of environmental anthropology and traditional ecological knowledge (TEK). As such, this dissertation offers an important foundation for the integration of local knowledge into more equitable and sustainable natural resource management policies and practices.

1.2.1 Practical Relevance

The findings of this research on *Hygeralai* hold strategic relevance for Indonesia and can serve as a foundation for formulating government policies in the fisheries and marine sectors. First, *Hygeralai* is a marine resource management system rooted in TEK that has been practiced across generations. Its success in managing and utilizing natural resources, preserving marine ecosystems, and regulating access by the Luang community demonstrates that local mechanisms can function as adaptive, low-cost, and sustainable management solutions. Second, *Hygeralai* supports the principles of community-based resource management, emphasizing the importance of active community participation in coastal governance. As such, this practice holds potential as a pilot model for developing inclusive and community-oriented national policies. Third, given the

vast number of small islands scattered across Indonesia's archipelago, the country faces significant challenges in effectively reaching and managing all coastal areas. This study reveals that local communities possess strong traditional institutional capacities for autonomous local governance. Recognizing systems such as *Hygeralai* can contribute to strengthening national socio-ecological resilience. Fourth, the practice aligns with the direction of blue economy-based marine development policies, which emphasize ecological sustainability and social equity.

Finally, the research provides a crucial basis for reinforcing legal aspects through the recognition of customary systems within national regulations such as their formalization in Regional Regulations (*Peraturan Daerah*) the development of community-based conservation areas, and integration into zoning plans for coastal and small island regions. In conclusion, *Hygeralai* is not only a cultural heritage but also a traditional ecological knowledge and a SES as well as one of the evidences within the Multiple Evidence Base for achieving sustainable marine development in Indonesia.

1.2.2 Theoretical Relevance

The findings of this study can serve as valuable material for anthropological research, particularly in the field of environmental ecosystem, both in marine and terrestrial environments. The findings of this study can serve as a valuable resource for future research on the topic of resilience in environmental management, specifically in relation to the ability to adapt and transform using local knowledge. The aim of this research is for it to serve as an educational tool for studying Indonesian Natural Resource Management subject.

1.3. Urgency of the Research

Luang Island serves as a recently established hub for fish production, aimed at supporting the Indonesian government's initiative. China is the only country that exports more fish than Indonesia, making Indonesia the second largest fish exporter globally. Luang Island is positioned in the epicenter of marine biodiversity, which is next to the Banda Sea. It is known for having the second largest coral reef area in Indonesia (Pannell, 1997). based on the ecology survei by the WWF tahun 2015 the rate of degradation of coral reefs on Luang Island is 0% seagrass.

(Estradivari et al., 2015, 2016; Marine and Fisheries Service of Maluku Province, 2021), which is far lower than other regions in Indonesia. Additionally, the island has an enormous amount of seagrass (Wagey & Z, 2008; Soleman & Noer, 2017; Tamami & Siswanto, 2021).

The presence of global climate threats and world economic and geostrategic challenges pose a significant risk to the marine environment, marine natural resources, as well as the people and culture of Luang Island. Sea's acidification is an important element that greatly influences and can cause bleaching of coral reefs around the Luang Island Sea in the future. Coral reefs in the waters of Luang Island serve as habitats and sources of nourishment for marine species. Coral bleaching may hinder the proliferation of marine organisms that inhabit it. Microscopic organisms and small organisms face challenges in their survival and are susceptible to disease, leading to a decline in their population. Gradually, the coral reef species will go extinct, causing disruption to the ecosystem in the waters of Luang Island.

Seawater acidity can also damage shelled organisms, including molluscs and seashells, in addition to coral reefs. The corrosive properties of acid may prevent the growth of shells in shelled organisms, such as the *Tridacna gigas*, which is abundant in the marine waters of Luang Island and is one of the marine organisms attracted to the *Hygeralai*. Seawater acidification can potentially disturb the biodiversity in the marine waters of Luang Island. The extensive seagrass beds in the waters surrounding Luang Island provide significant benefits as a food source for plankton and small fish (Cullen-Unsworth et al., 2014; De La Torre-Castro et al., 2014; Unsworth et al., 2014). The socio-economic and cultural conditions of the indigenous people of Luang Island may be negatively impacted by ocean acidification. Additionally, the marine fish trade commodity may experience a decrease as a result. The population of species such as oysters, mussels, sea urchins, and marine fish will decline. In the future, the people of Luang Island will encounter challenges in acquiring marine resources.

However, despite the constitutional protection provided to indigenous peoples in Indonesia, as stated in Article 18B paragraph 2 of the 1945 Constitution, Article 33, and Law Number 27 of 2007 on coastal areas, development programmes in Indonesia frequently neglect the rights, culture, and natural environment of indigenous peoples. This phenomenon can be seen in the implementation of government initiatives, such as the transmigration project, which affects the hierarchy of indigenous peoples' rights, particularly in Maluku. Government projects aimed at coastal indigenous people sometimes lack effective targeting. The over utilisation of natural

resources, specifically due to fish thievery by foreign and Indonesian vessels in the waters of Luang Island, along with the use of explosive methods like as bombs, potash, and borax by local fisherman known as *andong*, poses a significant threat to the ecosystem and the well-being of the people of Luang island (Berita Maluku, 2016; Salampessy, 2016).

Therefore, the management of natural resources and marine environmental conservation in Luang Island is a collective responsibility that requires the integration of local wisdom and policies across multiple sectors. The ecological complexity of this region calls for a collaborative approach that combines indigenous traditional knowledge with modern development strategies.

2. RESEARCH METHOD

2.1. Research Design

This research was designed as a qualitative study using ethnographic methods and Geographic Information System (GIS) methods, and adopting an ecological anthropology approach, particularly within the framework of TEK. Integrating the methods of ethnography and GIS, these combinations can assist in addressing the research enquiries and goals of this investigation. The ethnographic method was used to deeply explore community practices, narratives and value systems related to their understanding of marine space, customary prohibitions, fishing season cycles, religious rites and local institutional structures. The research involved participatory observation, in-depth interviews, and documentation of cultural practices, including participation in ritual ceremonies such as the opening and closing of *Hygeralai* that function as part of a resource management system based on spiritual and social-ecological values.

While GIS data is a comprehensive system that encompasses geographic elements and attributes relevant to various forms of location information. This includes techniques such as remote sensing and cartographic information (Frank, 1988). The combination of GIS, ecological anthropology, and ethnography is highly appropriate for understanding the sociocultural and ecological aspects of the Luang Island community, which is located in the outer islands and is a coastal community. This interdisciplinary approach allows for a comprehensive analysis of the community's spatial and temporal perspectives. The utilisation of GIS data is essential for conducting spatial analysis of Luang Island physical characteristics and for visualising detailed ethnographic data. GIS has the capability to integrate spatial data related to Luang island with ethnographic information regarding the socio-cultural relationships of the Luang people with their

environment. This research utilises GIS to facilitate the analysis and comprehension of the traditional mapping practices of the Luang people in marine environments. It focuses on studying their harvesting activities, known as *kerja meti* during the *Hygeralai* period. The research aims to uncover and comprehend the narratives that are concealed within the spatial and geographical aspects of the marine waters surrounding Luang Island. Furthermore, GIS has the capability to display marine regions that possess a significant abundance of natural resources.

The anthropological-ecological approach, particularly through the lens of TEK, offers a deeper understanding of how *Hygeralai* operates within the context of SES. *Hygeralai* functions not only as a system capable of resisting pressure (resistance) and adapting to change, but also serves as a transducer that connects cultural values with the community's ecological practices. In this context, resistance refers to an internal regulatory mechanism that maintains traditional practices such as customary fishing methods, ritual ceremonies, and spatial zoning within thresholds that ensure overall system stability. As an adaptive system, *Hygeralai* demonstrates the capacity to adjust and evolve, both structurally and functionally, in response to environmental changes such as seasonal shifts, external pressures, or shifts in resource governance policies.

Within the SES framework, *Hygeralai* occupies a vital position as a mediator between society (the social system) and the marine environment (the ecological system). It shapes and guides human–nature interactions through customary norms, cosmological beliefs, and spatial use systems, all of which contribute to enhancing system resilience. Through *Hygeralai*, the people of Pulau Luang are equipped with the means to observe, respond to, and adapt to local ecological changes, while maintaining the sustainability of their marine resources. *Hygeralai* not only supports the ecological integrity of tropical coastal environments but also acts as a collective knowledge system that unites values, belief systems, and social practices in the face of uncertainty and environmental challenges. Therefore, *Hygeralai* stands as an essential component in sustaining resilience, adaptive capacity, and the potential for transformation within the social-ecological system of the Pulau Luang coastal community. This research was conducted in 2022 and 2023, each for a duration of 3 months.

2.2. Sampling

In the research on *Hygeralai* as a TEK system of the Luang Island community, researchers used snowball sampling technique as an effective sampling strategy to reach informants who have in-depth knowledge of local cultural and ecological practices. This technique begins with selecting key informants, who become key informants in this study are the village head as well as the customary head, traditional leaders, religious leaders, women leaders and youth leaders.

Their selection is based on their strategic role in the social structure of the community. Traditional leaders are the primary custodians of customary values and norms directly related to *Hygeralai* practices. As symbolic and normative authorities, they have in-depth knowledge of customary rules, local history, and cultural natural resource management mechanisms. Religious leaders play an important role in reinforcing environmental values through spiritual narratives, linking nature conservation with moral and religious responsibilities. Youth leaders were chosen because they are agents of change who bridge traditional values and modern challenges, and are active in environmental education and conservation activities. Meanwhile, school principals have a strategic role in transmitting local wisdom through formal education and instilling ecological awareness in the younger generation. As for women leaders, they contribute through domestic and socio-cultural roles, and play an important role in transmitting ecological knowledge to children. The involvement of these various figures provides a comprehensive perspective and enriches the analysis of the sustainability of the *Hygeralai* system in the lives of Luang people.

In addition, supporting informants such as children aged 5-13 are also important. Data collection on children in *Hygeralai*'s research was conducted with a different approach from the methods used on adults, given the limitations of abstract communication and higher ethical sensitivity. Instead of passive interviews or observations, the researcher was directly involved in the children's daily activities, such as playing, swimming, or walking with them around Pulau Luang when the tide was low and the coastal area was open. Through this engagement, researchers created a non-formal, intimate and psychologically safe atmosphere, allowing children to express their views and knowledge of the ocean spontaneously and naturally. This approach allowed local narratives to emerge from the children about their experiences in *Hygeralai* practices, such as the zones they could and could not explore, their understanding of marine life, or the cultural stories they heard from their parents. With this method, data collection became more contextualised and experiential, while minimising the pressure that might arise in a formal interview situation.

Researchers remained mindful of ethical aspects, such as obtaining informed consent, and ensuring that children's involvement was voluntary and not disruptive to their comfort.

Through the initial interviews, the researcher then asked the informants for referrals to find other relevant informants, such as traditional fishermen, *Hygeralai* ritual performers, or senior citizens and elders who hold local knowledge for generations. In addition, the selection of children as informants in *Hygeralai* research is based on the reason that they are considered as early recipients of ecological and cultural knowledge passed on through social interactions and community experiences. From a linguistic perspective, the age of 5-13 years is an active period of language development, so they naturally absorb local vocabulary including marine-related terms and customs. In addition, their involvement can be an indicator of the continuity of inter-generational transmission of *Hygeralai* values. Therefore, the participation of children not only enriches the data, but is also important for assessing the cultural and ecological resilience of the local knowledge system

By using snowball sampling technique, the process of selecting informants is done gradually through recommendations from the initial informants to the next informants who are considered relevant and have knowledge about *Hygeralai*. This technique allows researchers to reach individuals who are difficult to access directly, and obtain rich and contextualised data. The sampling process was stopped when the information obtained began to repeat and did not produce new themes, which signalled that the research had reached the point of data saturation. At this stage, additional informants no longer provided significant new information, so the researcher could conclude that the data obtained was sufficient to answer the research questions and support in-depth analysis.

2.3. Data Collection

The methods of data retrieval employed in this study are literature review including archives, interviews, observations, focus group discussion (FGDs) and documentation. The data on *Hygeralai* was not only acquired through the literature investigation. The fact that there is insufficient data available on Luang Island must be acknowledged. Ecological data can be acquired through reports and studies conducted by the ecological institution WWF Indonesia, the fisheries agencies of the Government of Indonesia, the Indonesian Geospatial Agency (for maps), and the

Maluku Province Customs and Traditional Values Study Centre. Data was collected from various sources to support the research. These sources include studies on language (Taber & Kathy, 1989; van Dijk & De Jong, 1995) research on *Hygeralai* (Pannel, 1997), exploration of the culture of living with the Luang people (Karuna, 2012), investigation of fish and sea cucumbers (Leha, 2020), as well as study of fish species in the Luang Island atoll (Mosse dan Huttubessy, 2023). In order to acquire historical and archival data, research was conducted at various German government organisations like (e.g., Rautenstrauch-Joest Museum in Cologne, the Ethnography Museum in Berlin, and the Museum für Völkerkunde und Vorgesichte in Hamburg) were visited. Beside that in Netherlands also like (e.g. KITLV, the Dutch archive office, the Maluku museum, the Tropen Museum, and Library of the Leiden University). Throughout the course of this investigation, several significant reference sources were identified, including Wilhelm Müller's unpublished reports and diaries (1913–1914) concerning Luang Island, printed historical manuscripts related to Luang, *Ambonsche Rariteikamer* by Rumphius which explores the Maluku region, as well as Riedel's works on the historical development of the area. To further support the analytical framework of this study, a diverse range of scholarly materials were consulted, including peer-reviewed journals, academic articles, digital media, research reports, and books. Collectively, these sources have contributed to the construction of a more coherent theoretical foundation and enhanced the conceptual linkage to the examination of *Hygeralai*.

The data from all research components were acquired through comprehensive and organised face-to-face interviews. The data from certain components was acquired through unstructured interviews. Both structured and unstructured interviews communicated a sense of authenticity and adaptability to both myself and the designated participants. This maintains a relaxed and stress-free atmosphere during the interview process. In this scenario, We had the opportunity to pose the questions we had prepared to the informants without any hesitation. The informants, in turn, were able to respond to each question in a relaxed, adaptable, and unbiased manner.

Despite the flexible and relaxed nature of the interviews, they maintained a strong emphasis on focus and tried to obtain in-depth information. Every informant was required to offer truthful information. The purpose of this interview was to provide informants with the autonomy to acquire comprehensive information. The informants had comprehensive interviews to gain insight into, comprehend, and determine the thoughts, concepts, cultural, and social values of the Luang people regarding *Hygeralai*. This local knowledge has been passed down by their ancestors to preserve

the natural environment and its resources. During the interview process, I thoroughly documented information by hand in a log book to prevent any potential data falsification.

The interview process was conducted in accordance with the conditions, timing, and location specified by the informants. The interviews were conducted at various locations, including the informants' residences, the beach, and the waters surrounding Luang Island. The location of the interview depends upon the arrangement made with the informants. In order to show respect for the time that the informants spent working to provide for their families, and with the goal of ensuring an expedient interview process, I made accommodations to fit their schedules. If we were to wait for their return from working at sea to conduct the interview process, they would lack the necessary time and focus for the interview. If there were maritime informants who were willing to being interviewed while actively engaged in their work, we would attentively shadow them aboard a motorised vessel from dawn until the completion of their duties. Due to my active participation in their job throughout the interview process, the fishermen generously rewarded me with a generous quantity of freshly caught *garopa* fish to bring home. Subsequently, the fisherman engaged in seaweed farming generously provided me with a few kilogrammes of dehydrated seaweed. However, I declined it as a gesture of respect towards them. We exchanged it by requesting young coconuts, which were typically stocked on their engine boat as food.

Multiple times, I shadowed informants and conducted interviews with them on two specific islands, notably Metiamarang Island and Kelapa Island. Due to the lengthy duration of the interview procedure, We failed to notice the sudden recession of the tide. Based on the informant's estimations, the tide is expected to occur at approximately 2 am. Consequently, We had no choice but to rest for a few hours. The informant's calculation was proven to be accurate. The tide followed the expected schedule. Ultimately, We collectively embarked on a separate speedboat and journeyed for approximately 2-3 hours to return to the main island.

The interviews were carried out in several locations, including the informants' homes, besides the beach, and in the sea waters of Luang Island, specifically at seaweed farms and while fishing. The informants were not disturbed during the interviews, as per their own request. Furthermore, the benefit for me of conducting interviews at their place of work was the chance to acquire a significantly greater amount of information.

For the linguistic aspect, We collected data by initially engaging in participant observation to identify the indigenous phrases, idioms, and categories employed in daily conversation that

pertain to environmental factors. We actively participated in daily discussions on this particular component. We actively listened for unfamiliar vocabulary in the Luang language and documented them in my observation notebook (Hammersley & Atkinson, 2019; Spradley, 1979). Subsequently, we marked, enclosed in brackets, ticked off, or assigned codes to words. This facilitated the process of assessing the items that required verification from the respondents. Therefore, drawing on my regular interactions with the individuals in my local community, we utilised this information as a foundation and point of reference to formulate additional enquiries pertaining to this particular subject matter. Subsequently, we carried out comprehensive, open-ended interviews with my sources of information.

The informants chosen for certain aspects were children between the ages of 5 and 13, taking into account their extensive vocabulary. Furthermore, their knowledge of the world may be connected to the environment in which they reside and engage in recreational activities. I collected data through direct interaction with individuals when they were engaged in activities like as playing, swimming in the sea, walking between islands during low tide, and engaging in conversations on various topics. Furthermore, following the conclusion of the interviews on the large island, We patiently awaited their return from school and proceeded to walk along the shoreline during low tide, making my way to their residence located in one of the small settlements adjacent to the large island. The duration of the walk typically spans approximately 40 minutes on foot and approximately 15 minutes by motorised boat. During our journey, we typically discuss topics related to the children's experiences and educational curriculum, and we make commitments to engage in joint activities while at sea. We acquired knowledge of terminology and children's narratives pertaining to the natural sea ecosystem.

In addition, a FGDs took held at the village hall, which serves as a gathering spot for the residents of East Luang and West Luang villages. The purpose of this activity is to verify several aspects, including historical information, the mapping of marine areas using traditional knowledge, the application of *Hygeralai* in specific areas, and the identification of sacred locations.

Observations were done to supplement and validate data obtained from interviews and FGD. This effort was undertaken with a dedicated effort to establish a connection by taking physical and mental risks to interact with the people of Luang island and understand the reasons behind their actions, it involved directly participating in activities, experiencing them personally, and documenting the researcher's observations. I conducted observations and interviews concurrently,

occasionally conducting them independently based on the field conditions. During these circumstances, I actively engaged as an active participant. (Creswell, 2012)

In relation to this, the researcher recorded various important findings during the observation, including the social and collective behaviour of the community in the implementation of *Hygeralai*, which includes the preparation stage, ritual procession, to closing, as well as the level of community compliance with the prohibition of sea cucumber collection during the closing period. In addition, researchers observed the community's interaction patterns with the marine environment, especially in the use of sustainable harvesting methods that do not damage habitats such as coral reefs, as well as how the community treats other marine organisms. Other aspects observed included the role of social institutions such as churches, schools and youth organisations in reinforcing *Hygeralai* values through education and joint activities. Researchers also recorded elements of daily life related to marine practices, such as the use of traditional fishing gear, and customary signs for marine boundaries. In addition, local vocabulary related to the marine ecosystem, which illustrates the cognitive and linguistic dimensions of this knowledge system, was also recorded.

Small details that emerge in the observation process, especially verbal ones such as local vocabulary, relating to marine ecosystems, which illustrate the cognitive and linguistic dimensions of this knowledge system can be documented using brackets, coloured ink pens, small circles or specific codes. This technique aims to make it easier for researchers to retrace information obtained, understand the intent of informants' statements, and ensure that data references remain accurate and relevant when further analyses or clarifications are made to informants. This approach is very important in maintaining the accuracy of field data interpretation, especially in an ethnographic context that emphasises the depth of meaning in social and cultural interactions.

Documentation is a written record of previous occurrences. Documentation serves as both a supplement and a crucial method of gathering facts related to the strong mentality of a community and historical information (Biczó, 2019). Documentation was utilised in the process of data collecting as a supplementary method alongside interviews, observations, and FGD. During this project, We analysed data obtained from newspapers and examined actual photographs. Essentially, the data in this research encompasses the phenomena being studied, revealing the mechanisms and causes behind happenings in a certain environment. The central focus of the 'thick description' (Geertz, 1973) is the attitudes and experiences of the participants. The objective is to

provide a clear and coherent description of the Luang people's characteristics and behaviours within the framework of *Hygeralai*, with the purpose of incorporating it into this dissertation.

When is field data collection completed and stopped? In conducting research in the field, researchers applied the snowball sampling technique by starting data collection from a number of key informants and supporting informants. The interview and observation process took place continuously and gradually, until finally the researcher found that the information obtained began to repeat the same pattern, without producing significant new findings. For example, descriptions of symbolism in traditional rituals, the process of inheriting cultural values, and the community's views on social change showed consistency of themes and uniformity of content between informants.

Under these conditions, it can be concluded that the data has reached a saturation point, both in terms of thematic, social meaning, and diversity of viewpoints. Researchers have also managed to collect data from various social layers in the community, so that a complete picture of the social structure and local culture can be described as a whole. Based on this, data collection can be stopped, because the research has fulfilled the main principle in the qualitative approach, which prioritises depth of meaning over the number of informants. The achievement of data saturation is an indicator that the researcher has successfully explored, understood and documented the cultural life of the Pulau Luang community in a comprehensive and representative manner.

The data collection process in this study was declared complete when the researcher reached data saturation, a condition in which information obtained from interviews, observations, and field interactions no longer produced new meaningful information or themes. At this stage, the main relevant themes begin to repeat and appear consistently among various informants, so that the addition of data no longer enriches the understanding of the phenomenon being studied. This data saturation is an indicator that the diversity of informants' perspectives and experiences has been adequately represented, and the collected data is considered sufficient and comprehensive to answer the research focus as a whole. The concept of data saturation refers to the thinking of Guest, Bunce, and Johnson (2006), who state that saturation is achieved when “no new information or themes are observed in the data” . In qualitative research approaches, such as ethnography, the main objective is not the number of informants but the depth of meaning and representation of the social experiences being studied. Therefore, the data collection process was halted methodologically and ethically, considering that the field exploration had provided sufficient

contextual understanding of the social-ecological system of the Luang Island community, particularly regarding traditional ecological knowledge (Hygeralai), which is the primary focus of this study.

Furthermore, a data tabulation process was conducted based on responses to 148 different questions posed to a number of participants, to assess the extent to which data saturation had been achieved. Referring to the standards used in qualitative research, the threshold for data saturation is considered to have been reached when it exceeds 70% (Daher, 2023; Morse, 1995). Based on the results of the tabulation of the informants' answers in this study, it was found that the level of data saturation had reached more than 90%. This indicates that the majority of important themes and information had emerged consistently, and that the diversity of perspectives had been adequately represented. Thus, it can be concluded that the information was saturated and data collection could be stopped because no new significant data or themes were found. Although this study uses a qualitative approach, the inclusion of quantitative data as a complement is important to strengthen the validity of the narrative and interpretation of the research results. The percentage of data saturation in this study is presented in tabular form to clearly show the repetition and consistency of the information obtained from the informants.

2.4. Data Analysis

The data in this study were analysed using according to the combination method which is ethnographic, Geographic Information Systems analysis (GIS) in the traditional ecological knowledge (TEK) framework approach, SES framework dan adaptive cycles and panarchy (Figure 36).

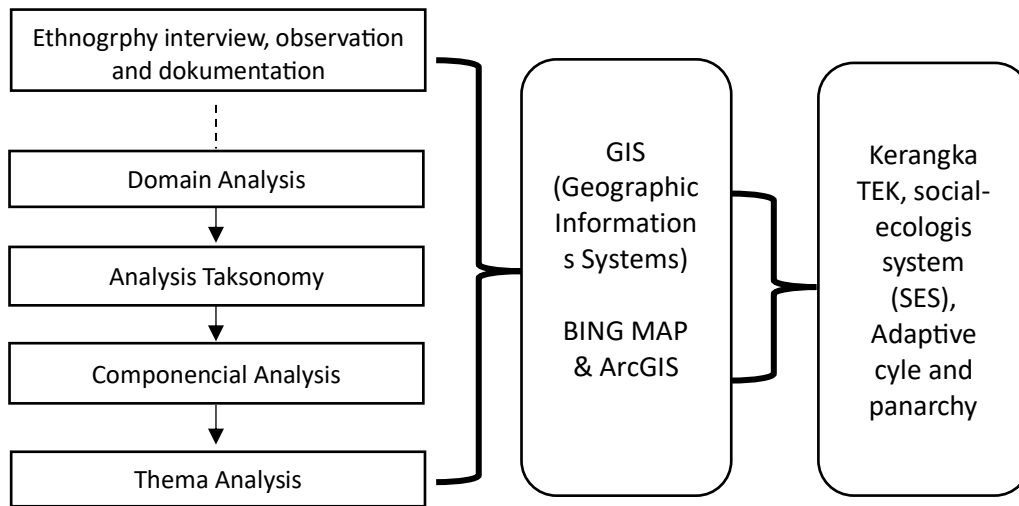


Figure 1: analytical framework of ethnography and Geographic Information System (GIS).
Source: Own illustration based on Spradley (Spradley & McCurdy, 1972), Frank (Frank, 1988), Berkes (Berkes et al., 1995), Gunderson & Holling

Figure 1 illustrates about the analysis framework in the *Hygeralai* study integrates combination analysis. The analysis in this study was conducted in a gradual and structured manner, starting with ethnographic data collection and analysis as the first step. Researchers conducted participatory observations, in-depth interviews, and direct involvement in the daily activities of the people of Luang Island, such as traditional rituals, *Hygeralai* practices, and exploration of coastal areas during low tide. This data was used to identify key themes in *Hygeralai* practices, including the sea prohibition system, cultural value structures, and forms of local ecological knowledge.

Once qualitative data was collected, the next step was spatial visualisation using GIS technology. Information from interviews and participatory mapping (mental mapping) was translated into digital maps to represent no-go zones, ritual areas and fishing trails. This mapping not only enriched the visual understanding of marine cultural spaces, but also strengthened the validity of the qualitative data.

The final step is a theory-based thematic analysis using the frameworks of TEK, SES, adaptive cycles, and panarchy. TEK was used to interpret the values, practices and local knowledge structures that shape *Hygeralai* as a living traditional ecological system. The SES framework is

used to analyse the reciprocal relationship between the community and the marine environment, as well as the role of *Hygeralai* in maintaining the sustainability of the social-ecological system. Meanwhile, adaptive cycles allows researchers to understand the dynamics of change in the *Hygeralai* system from the phases of stability, crisis, to reorganisation. Finally, panarchy is used to read influences across scales from local to global and how external pressures (such as government policies or religious changes) can trigger transformation or adaptation at the community level. Through these stages, the analysis becomes more holistic and contextualised, explaining how *Hygeralai* is not only a cultural heritage, but also an active local mechanism in maintaining ecosystem sustainability and community identity.

Thus, the combination of ethnographic methods, GIS-based spatial visualisation, and the analytical frameworks of TEK, SES, adaptive cycles, and panarchy allowed this research to examine *Hygeralai* as a whole from cultural, ecological, spatial, and social transformation dimensions. This integrated analytical approach is expected to produce an in-depth, contextualised and relevant understanding in explaining the role of local knowledge in the sustainability of the SES of the Luang Island community. For detail refers to (Table 1).

Table 1: Distribusi analysis berdasarkan Research Questions (RQs)

RQs	Analysis
RQ1: How does <i>Hygeralai</i> affect cognitive and linguistic aspects of Luang islanders?	Ethnography, GIS, TEK framework, dan SES.
RQ2: What historical factors contributed to the rise of a local social movement against the implementation of <i>Hygeralai</i> ?	Ethnography, GIS, TEK framework, dan SES.
RQ3: What historical factors contributed to the rise of a local social movement against the implementation of <i>Hygeralai</i> ?	Ethnography, GIS, TEK framework, dan SES.
RQ4: To what extent does <i>Hygeralai</i> impact the ecosystem of Luang Island's marine environment? How the dynamic of <i>Hygeralai</i> in social-ecological system and resiliency?	Ethnography, GIS, TEK framework, dan SES, Gunderson and Holling

Source: by researcher own 2025

3. RESULTS

This study's findings indicate that *Hygeralai* is a multidimensional local knowledge system within the Luang Island community, encompassing historical, socio-cultural, ecological, and cognitive-linguistic dimensions, and enhanced by GIS technology. Historically, *Hygeralai* evolved from territorial boundaries to the incorporation of the community's religious beliefs. From a socio-cultural aspect, *Hygeralai* contributes to reinforcing social unity, highlighting collective identity, and governing social interactions according to traditional standards. Ecologically, *Hygeralai* serves as a community-oriented resource management system that promotes sustainable marine conservation activities. From cognitive and linguistic aspect, *Hygeralai* influences the framework of collective thinking and enhances the cultural vocabulary transmitted orally. This research integrates ethnography, ecological anthropology approach, particularly within the framework of TEK, and GIS methods to comprehensively map the cultural space and ecological practices of *Hygeralai*, thereby elucidating the strategic significance of this tradition in sustaining the social-ecological equilibrium of the Luang Island community. This is effectively clarified below.

3.1. The Cognitive and Linguistic Aspect

This section examines the cognitive and linguistic dimensions of how the people of Pulau Luang view the marine ecosystem, which is an integral part of their daily lives. The discussion begins with cosmology, as it is the most fundamental and comprehensive knowledge structure that people have in understanding the world around them. Cosmology explains the Luang community's perception of the relationship between humans, the universe and spiritual forces, which also reflects their value system, beliefs and direction in life. This knowledge forms the basis for mapping space, determining orientation, and interpreting natural phenomena. For the Luang people who depend heavily on the sea, marine cosmology is not only a belief but also a practical guide in determining the time to go to sea, establishing relationships with sea creatures, and understanding the boundaries between the profane and sacred worlds. Therefore, cosmology becomes the main foundation in understanding all cognitive aspects of the Luang people's maritime culture.

In this study, cosmology includes spatial categories and directional orientation, as well as the concept of sea cosmology, which shows how the sea is spiritually and symbolically interpreted. This understanding is then linked to other cognitive aspects, such as how the Luang community maps the sea area based on local knowledge, how they treat each water zone, and how marine life is represented culturally, both through traditional narratives, spatial arrangement of settlements such as the placement of boats in the village structure, and syncretism between maritime culture and elements of Christian spirituality seen in the symbols on the church altar.

After describing the thinking structure and local knowledge of the community, this chapter also outlines the linguistic aspect, namely how language is used as a medium to store, transmit and maintain maritime knowledge. This is reflected in the naming of marine spaces, local terms for marine creatures, and the use of metaphors and verbal symbols that reflect the Luang community's worldview of the sea. By organising the discussion sequentially, from thought to language, this chapter aims to show that the Luang people's maritime culture lives not only in physical practices, but also in structures of thought and language, which are intertwined in forming a collective identity and traditional knowledge system (*Hygeralai*), showing that the language used by the Luang people directly refers to the structure and dynamics of the marine ecosystem.

3.2. Socio-Cultural Aspect

This section comprehensively examines the interconnections between sea cucumber populations, the social structure of the Pulau Luang community, and the practice of *Hygeralai* as a custom-based natural resource management system. Sea cucumbers in this context are not only economically valuable, but also play an important role in the formation and maintenance of social structures, and bind community solidarity. Understanding the biological, social and economic dimensions of sea cucumbers is therefore key in explaining the sustainability of the *Hygeralai* system. The first study in this section focuses on sea cucumber populations and their relationship to the social structure of the Luang community. The distribution of access to harvesting areas, yield sharing, and decision-making authority is inseparable from the caste system and customary leadership. Ecological knowledge of sea cucumber life cycles, habitats and sustainable harvesting techniques are part of the cultural heritage passed down through generations, and form the basis of *Hygeralai* practices. It should also be noted that, while sea cucumbers are the main species in *Hygeralai* arrangements, in practice, communities also harvest other marine species such as

abalone (*Haliotis asinina*), giant clams (*Tridacna gigas*) and lola (*Trochus niloticus*) during customary harvest periods.

The discussion then turns to Pulau Luang's involvement in the sea cucumber trade in the Asia-Pacific region. It is important to show how local practices based on indigenous wisdom are also under pressure from the global market. Price dynamics, the role of investors (methi buyers) and the expectations of outside markets influence the way communities manage their resources. The tension between economic and cultural values is a major concern in this context. Apart from being an economic commodity, sea cucumbers also function as an important element in maintaining the social order of the community. The harvest is not only utilised for personal needs, but also for collective interests such as church construction, support for traditional activities, and social solidarity. This process demonstrates how local cultural values such as gotong royong, fair share and social responsibility are realised through the utilisation of natural resources.

Finally, this section systematically outlines the stages of Hygeralai implementation, from preparations such as monitoring sea products and auctioning sea cucumber prices, conducting opening and closing rites, establishing harvesting areas, enforcing customary sanctions, to the roles of actors involved in coordinating and implementing the system. Customary Figures such as kings, soa heads and elders, work closely with the church and community to ensure the smooth running and compliance with Hygeralai rules. Community participation in the harvest is also organised based on the prevailing social structure, reflecting the social as well as ecological sustainability of the system.

3.2. History Aspect

This section examines the cognitive and linguistic dimensions of how the people of Pulau Luang view the marine ecosystem, which is an integral part of their daily lives. The discussion begins with cosmology, as it is the most fundamental and comprehensive knowledge structure that people have in understanding the world around them. Cosmology explains the Luang community's perception of the relationship between humans, the universe and spiritual forces, which also reflects their value system, beliefs and direction in life. This knowledge forms the basis for mapping space, determining orientation, and interpreting natural phenomena. For the Luang people who depend heavily on the sea, marine cosmology is not only a belief but also a practical

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In this part also describing about the thinking structure and local knowledge of the community, this chapter also outlines the linguistic aspect, namely how language is used as a medium to store, transmit and maintain maritime knowledge. This is reflected in the naming of marine spaces, local terms for marine creatures, and the use of metaphors and verbal symbols that reflect the Luang community's worldview of the sea. By organising the discussion sequentially, from thought to language, this chapter aims to show that the Luang people's maritime culture lives not only in physical practices, but also in structures of thought and language, which are intertwined in forming a collective identity and traditional knowledge system (*Hygeralai*), showing that the language used by the Luang people directly refers to the structure and dynamics of the marine ecosystem.

3.4. The Environmental Effect of *Hygeralai*, *Hygeralai* in Social-Ecological System and Adaptive Cycle

This section discusses the impact of *Hygeralai* on the marine ecosystem of Luang Island. We begin by examining the extent to which the local community adheres to the customary rules of *Hygeralai*. Furthermore, we explore the significance of the *Sea cucumber* as a primary species, along with other species that are simultaneously harvested within the *Hygeralai* framework, in maintaining marine ecological balance. In addition, this section addresses the influence of *Hygeralai* on the daily lives of the Luang people, particularly in terms of behaviors aimed at

preserving the population of marine resources beyond sea cucumbers and associated species. The overarching goal is to ensure the sustainability of natural resources and the marine ecosystem. It is also essential to examine the various factors that influence these practices. Lastly, we analyze how customary institutions respond to and collaborate with other stakeholders, such as the church, schools, and women's associations, in reinforcing the implementation of *Hygeralai*.

Ecological impacts are never singular; rather, they are the result of complex interactions between internal (local) systems and external pressures originating outside the community. In this regard, the TEK approach becomes highly relevant in explaining these dynamics. As Berkes (2017) argues, TEK is not a static system of knowledge but an accumulation of ecological experiences developed through long-term socio-cultural adaptation to the environment. In the context of *Hygeralai*, this system represents a localized form of TEK situational, flexible, and grounded in careful observation of natural cycles and social relations. However, the effectiveness of TEK is significantly influenced by the community's capacity to maintain its ecological practices amid external pressures such as the introduction of Protestant Christianity, shifting cultural values, climate change, geographical vulnerability, and development policies that are often misaligned with local values. The resilience of *Hygeralai* is thus a central focus in this section, with the aim of analyzing the extent to which this traditional ecological knowledge system can endure and adapt to multiple challenges, both internal and external.

This analysis is crucial in determining whether *Hygeralai* continues to fulfill its function in maintaining marine ecological balance and preserving local cultural values, or whether it is undergoing weakening due to social, economic, environmental changes, and external policy interventions. By exploring its resilience, this study seeks to understand the adaptive dynamics of *Hygeralai* as a living and evolving SES in the face of contemporary transformations. Therefore, to fully comprehend the impact of *Hygeralai* on the marine ecosystem of Luang Island, it is essential to analyze how this local knowledge system operates within the framework of a socio-ecological system that is in continuous interaction with internal community factors and dynamic external challenges. This section will subsequently lead into an analysis of the socio-ecological dynamics of *Hygeralai* through the lens of the adaptive renewal cycle and panarchy framework.

4. CONCLUSION

This concluding section revisits the four research questions initially posed in the introduction. Each question is restated and systematically addressed, with the corresponding conclusions presented accordingly.

1. How does *Hygeralai* affect cognitive and linguistic aspects of Luang islanders?

Hygeralai influences the cognitive aspects of the people of Pulau Luang by shaping the way they understand and classify marine space, time, direction, and ecological relations symbolically and socially. This knowledge is part of Traditional Ecological Knowledge (TEK), a knowledge system that develops locally and is passed on across generations through direct experience, observation of nature and cultural structures. TEK in the *Hygeralai* context is rooted in local cosmology, where the sea is not only understood as a physical space, but also as a living entity connected to spiritual forces and ancestors. This cosmology becomes a collective framework that regulates ecological behaviour, such as fishing time, prohibited zoning, and the performance of traditional rites. In linguistic aspects, *Hygeralai* is also manifested in local vocabularies, idioms, and traditional poem marine zone naming systems, ritual terms and nature metaphors. Language acts as the main medium in transmitting traditional ecological knowledge, while strengthening the cultural identity of coastal communities. Thus, *Hygeralai* as part of TEK not only stores ecological information, but also becomes a meaning structure that connects the community to the environment in a sustainable and meaningful way.

2. To what extent does *Hygeralai* work in social-cultural live of Luang islanders?

Hygeralai functions significantly in the socio-cultural life of the people of Luang Island as a custom-based and hereditary marine resource management system. This system focuses on sea cucumber management, which is not only of high economic value in the Asia-Pacific trade network, but also has an important position in the social structure of the community. In the context of Traditional Ecological Knowledge (TEK), *Hygeralai* reflects local knowledge that is structured and internalised through rites, language, harvesting practices (*karja meti*), as well as collective rules such as the establishment of prohibition areas, population monitoring, and harvest timing. The entire process-from preparation, to opening and closing rituals, to auctioning sea cucumber prices and involving participants-

demonstrates the close relationship between people, nature and cultural values. Within the Social-Ecological System (SES) framework, Hygeralai is an example of adaptive community-based governance, with high levels of social compliance, clear division of roles, and internal mechanisms to maintain a balance between marine ecosystem sustainability and the socio-economic needs of the community. As such, *Hygeralai* is not only a traditional system, but also a representation of the integration of local knowledge in building social-ecological resilience in Pulau Luang.

3. What historical factors contributed to the rise of the implementation of *Hygeralai*?

Hygeralai on Pulau Luang is the result of a complex interaction between local cosmology, religious dynamics, and ecological conditions typical of small islands. The transformation of the *Hygeralai* system involves three main dimensions of change. First, ontological change, which is a shift from an animistic view that sees nature as a living entity, towards a relational view that places humans and nature in a reciprocal relationship called relational ontology. Secondly, the epistemological shift, triggered by the introduction of Christianity, encouraged the integration of local knowledge systems and religion in the form of synthesis, in accordance with the Multiple Evidence Base (MEB) approach. Thirdly, institutional change characterised by the involvement of cross-institutional actors from customary leaders, churches and customary governments in collaborative resource management, as one example within the hybrid environmental governance framework.

Ecological aspects also have an important contribution to make in shaping the character of *Hygeralai*, including through phytogeographic and natural history data supporting the presence of specific plants used in indigenous symbolism, as well as its connection to the biogeographical boundaries of Wallacea and the Weber Line. *Hygeralai* is derived from the Luang people's own internal historical narratives, thus making it an authentic, community-based natural resource management system. Besides functioning as an instrument of natural resource management and ecological conservation, *Hygeralai* also plays an important role in strengthening the cultural identity and local legitimacy of the Luang people.

4. To what extent does *Hygeralai* impact the ecosystem of Luang Island's marine environment? How the dynamic of *Hygeralai* in social-ecological system and resiliency? *Hygeralai* on Luang Island is a custom-based social-ecological management system that

contributes significantly to the conservation of marine ecosystems. Through regulating harvest times, prohibiting destructive fishing gear and marking sacred areas, *Hygeralai* maintains the sustainability of important species such as sea cucumbers, clams and lola. However, this system faces internal pressures such as weakening customary authority and shifting values, as well as external pressures of illegal fishing, marine pollution and climate change impacts. Within the framework of the adaptive renewal cycle and panarchy, *Hygeralai* shows the dynamics from exploitation, conservation, collapse, to reorganisation phases, where customary values are integrated into church institutions and village governance. Its resilience lies in the community's capacity to adapt and transform institutions collaboratively across scales. *Hygeralai* thus reflects the dynamic, resilient and contextualised practice of TEK in maintaining the marine ecological balance of Luang Island.

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6. List of Publications



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Nyilvántartási szám: DEENK/363/2025.PL
Tárgy: PhD Publikációs Lista

Jelölt: Kissiya, Efilina
Doktori Iskola: Történelmi és Néprajzi Doktori Iskola
MTMT azonosító: 10086340

A PhD értekezés alapjául szolgáló közlemények

Idegen nyelvű, külföldi könyvrészletek (1)

1. **Kissiya, E., Biczó, G.:** Understanding nature through the Woman's Perspective on Luang Island Maluku Province-Indonesia.
In: Indonesia Contemporary Challenges. Ed.: Sylwia Tubielewicz-Olejniak, Imanuella R. Andilolo., Adam Marszaek Publishing House, Torun, 57-73, 2024. ISBN: 9788381809122

Idegen nyelvű tudományos közlemények hazai folyóiratban (3)

2. **Kissiya, E., Biczó, G.:** Indigenous knowledge and environmental governance - a local wisdom-based approach in Indonesia (literature review).
Különleges Bánásmód. 11 (Spec.Iss.), 65-79, 2025. EISSN: 2498-5368.
DOI: <http://dx.doi.org/10.18458/KB.2025.SI.65>
3. **Kissiya, E., Biczó, G.:** The Local Wisdom Of Luang Islands: 'Hygeralai' Of History Aspect.
Különleges bánásmód. 10 (Spec), 47-62, 2024. EISSN: 2498-5368.
DOI: <https://doi.org/10.18458/KB.2024.SI.47>
4. **Kissiya, E., Biczó, G.:** Luang Island: Coastal Ecology System in Outermost Small Islands (ESCAOSd), Maluku-Indonesia.
Különleges bánásmód. 9 (1), 37-55, 2023. EISSN: 2498-5368.
DOI: <http://dx.doi.org/10.18458/KB.2023.1.37>

Idegen nyelvű konferencia közlemények (2)

5. Calvin, K., **Kissiya, E., Biczó, G.:** Collective Memory and Luang Language Shift (Ltiery Lgona) at the Lexical Level.
In: Proceedings of 5th Borobudur International Symposium on Humanities and Social Science (BISHSS 2023). Eds.: Pambuko Zulfikar Bagus, Setiyo Muji, Praja Chrisna Bagus Edhita, Setiawan Agus, Yuliasuti Fitriana, Muliawanti Linta, Dewi Veni Soraya. Atlantis Press SARL, Paris, 263-271, 2024, (Advances in Social Science, Education and Humanities Research ISSN 2352-5398 ; 856.) ISBN: 9782384762729





6. **Kissiya, E.**, Biczó, G.: The Existence of Boats and Luang People - Maluku - Indonesia.
In: Proceedings of the 4th Borobudur International Symposium on Science and Technology
2022 (BIS-STE 2022) / edited by Muji Setiyo et al, Atlantis Press, Paris, 626-633, 2023,
(Advances in Engineering Research, ISSN 2352-5401 ; 225) ISBN: 9789464632842

Idegen nyelvű absztrakt kiadványok (1)

7. **Kissiya, E.**, Biczó, G.: Human-Nature in Indonesia-Maluku (Hygera Lai: Haritage to Ecology
Protect in Luang Island).
In: VII. Különleges Bánásmód Nemzetközi Interdiszciplináris Konferencia = 7th International
Interdisciplinary Conference about Special Treatment: Program- és absztraktkötet = Program
and Abstract Volume. Szerk.: Mező Katalin, Mező Ferenc, Debreceni Egyetem, Debrecen,
103, 2022. ISBN: 9789634904212

További közlemények

Idegen nyelvű tudományos közlemények külföldi folyóiratban (4)

8. Imbang, D., **Kissiya, E.**, Kaunang, S. T. G., Tulung, G. J., Tumiwa, J. R., Arie, F. V., Biczó, G.: A
Contrastive Morphological Analysis of the Tombulu Dialect of the Minahasa Language and
Indonesian in the Context of Local Language Instruction.
Journal of Posthumanism. 5 (3), 1547-1580, 2025. ISSN: 2634-3576.
DOI: <http://dx.doi.org/10.63332/joph.v5i3.946>
9. Fadli, M. R., **Kissiya, E.**: Character Education Perspective KH. Hasyim Asy'ari's and its
Relevance in the Digital Age.
SwarnaDwipa. 8 (1), 17-30, 2024. EISSN: 2580-7315.
DOI: <http://dx.doi.org/10.24127/sd.v8i1.3266>
10. Arie, F. V., **Kissiya, E.**: Geopolitical Risk and Higher Education in Indonesia: A Systematic
Literature Review.
Cross Cult. Manag. J. 26 (2), 139-153, 2024. ISSN: 2286-0452.
DOI: <http://dx.doi.org/10.70147/c26139153>
11. Pattiasina, J., **Kissiya, E.**, Sopacua, J., Manuputty, C. J.: The Existence of the Wapauwe Old
Mosque in Kaitetu as a Trace of Islam Spread in Maluku.
Jurnal Lektur Keagamaan. 20 (2), 351-382, 2024. ISSN: 1693-7139.
DOI: <https://doi.org/10.31291/jlka.v20i2.1067>



A DEENK a Jelölt által a Tudóstérbe feltöltött adatok bibliográfiai és tudánymetriai ellenőrzését a
tudományos adatbázisok és a Journal Citation Reports Impact Factor lista alapján elvégezte.

Debrecen, 2025.06.03.