UTS ePRESS

Cosmopolitan Civil Societies: An Interdisciplinary Journal

Vol. 17, No. 3
2025

Citation: Rado, R. H., Purwanda, S., Betaubun, R. M. N., Adam, A. F., Rachmat. 2025. Protection of Yei Tribe's Sago Food Processing as Traditional Knowledge: An Archive-Based Effort on Digitization. *Cosmopolitan Civil Societies: An Interdisciplinary Journal*, 17:3, 94–105. https://doi.org/10.5130/ccs.v17.i3.9486

ISSN 1837-5391 | Published by UTS ePRESS | https://epress.lib.uts.edu.au/journals/index.php/mcs

ARTICLE (REFEREED)

Protection of Yei Tribe's Sago Food Processing as Traditional Knowledge: An Archive-Based Effort on Digitization

Rudini Hasyim Rado[1], Sunardi Purwanda[2], Restu Monika Nia Betaubun[3], Aenal Fuad Adam[1], Rachmat[1]

[1] Musamus University, Merauke, South Papua, Indonesia
[2] Andi Sapada Institute of Social Sciences and Business, Kota Parepare, Sulawesi Selatan, Indonesia
[3] Universitas Terbuka (Open University), Jayapura, Papua, Indonesia

Corresponding author: Rudini Hasyim Rado, Musamus University, Street Kamizaun Mopah Lama, Merauke, South Papua, 99611, Indonesia, rado_fh@unmus.ac.id

DOI: https://doi.org/10.5130/ccs.v17.i3.9486
Article History: Received 10/12/2024; Revised 05/06/2025; Accepted 11/06/2025; Published 17/12/2025

Abstract

Communal intellectual property on traditional knowledge, in the South Papua region, has not been adequately identified. This research focuses on the importance of digitized archives for the protection and preservation of traditional knowledge on the processing of Yei tribal sago snacks. This socio-legal study uses an ethnographic study approach. The results found that the Yei tribe's sago food processing practices fulfill the elements for protection as traditional knowledge including methods or processes, skills, and/or sago processing skills as traditional food even though they have not been recorded and registered in the communal intellectual property database on traditional knowledge. In this era of globalization, there is a need for documentation and publication based on digitized archives for the entire practice of processing sago snacks so as to produce digital copies available on the internet or other devices to ensure accessibility, sustainability and preservation of traditional knowledge that can later be passed on to the next generation.

Keywords

Sago Food Processing; Communal Intellectual Property; Traditional Knowledge; Yei Tribe, South Papua; Digitization

DECLARATION OF CONFLICTING INTEREST The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. **FUNDING** This research was funded by the Directorate of Research, Technology, and Community Service, Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia through BIMA with Contract Number 062/E5/PG.02.00/PL/2024 dated June 11, 2024.

Introduction

In October 2021, Miss World Malaysia 2021 Lavanya Sivaji uploaded a photo of a batik dress on social media. She informed her social media followers that the batik dress was Malaysian batik cloth (Baswedan et al. 2010). The claim was criticized by the Indonesian people. With Indonesia's abundant biodiversity and cultural diversity resources (Republic of Indonesia 2011, Ridwan 2018, Nugroho 2024), it is inevitable that this kind of claim may occur in the future. Traditional knowledge is a national asset that must be protected and preserved, which is why it needs to be protected through intellectual property rights (Kusumadara 2011).

Intellectual property rights (IPR) are rights that arise from the results of a thought process that produces a product/process that is useful for humans (Koto 2023). It can be understood that intellectual property rights not only protect private ownership, but also accommodate communal intellectual property rights (Purwanda et al. 2024.). Communal intellectual property rights are intellectual property ownership owned by a group of people who exist somewhere permanently. In Indonesia, communal intellectual property itself consists of four types, including: traditional cultural expressions, traditional knowledge, genetic data sources, and geographical indications.

According to United Nations Educational, Scientific and Cultural Organization (UNESCO), intangible cultural heritage is the practices, representations, expressions, knowledge, skills, and creativity that are part of a society's cultural heritage (Septarina 2016; Prathama et al. 2023). One of them is traditional knowledge, a concept that is generally used to refer to knowledge that has a long tradition and/or is relevant to indigenous peoples (Liu 2003; Adawiyah & Rumawi, 2021). Thus, this kind of knowledge practice is a manifestation of cultural wealth that should be preserved, protected and recognized to ensure the prosperity of the community that is its origin.

This awareness of traditional knowledge has been a concern of the Indonesian nation since the ratification of The Nagoya Protocol, on 29 October 2010. This has also been regulated in the 1945 Constitution of the Republic of Indonesia to 'recognize and respect traditional rights that are still alive and in accordance with development', including respecting 'cultural identity and the rights of traditional communities are respected in line with the development of the times and civilization' (Kurnianingrum 2020). Various related laws were also enacted, including: Copyright Law, Patent Law, Cultural Promotion Law as well as the Government Regulation on Communal Intellectual Property (Putri et al. 2024). This provision regulates the need to conduct an inventory of communal intellectual property, which is currently scattered and has not been fully recorded, in order to avoid misuse, deception, fraud, misrepresentation, and misappropriation (Sardjono 2012; Susanti 2022). his has been regulated in the Explanation of Article 27 paragraph (2) of the Government Regulation on Communal Intellectual Property.

The inventory of traditional knowledge diversity that can be identified and implemented to date includes traditional/local foods such as sago processing. For example, the Indonesian people, especially in the Papua region, have more extensive knowledge of sago than other regions in Indonesia and even other regions in the world. According to data from the National Plantation Statistics for 2020-2022, the area of sago land in Papua reaches 5.2 million hectares, with a potential sago flour production of 3-5 tonnes per year (Republic of Indonesia, Sekretariat Direktorat Jenderal Perkebunan 2021).

Utilizing sago as the main food source, the Yei/Yeinan tribe in South Papua Province consistently practice traditional knowledge it. Generally, the practice and process of processing sago into traditional food begins with gathering family members as the main unit of production, felling sago trees, smoking sago, squeezing sago starch into sago flour to processing into ready-to-eat food. Over the years, this food has not only been a form of food security but also a marker of identity, territorial boundaries, and functions in rituals and customs. Sago is always present and plays a key role in every ritual or festival held by ethnic groups in the lowlands of Papua (Arif 2019).

In the era of globalization, such practices as intangible cultural heritage should be preserved and innovated so that they still exist and are not eroded by the challenges of the times (Sulistianingsih et al. 2021). Cultural practices reflected in traditional methods or processes, technical prowess, skills and/or agricultural knowledge of this kind should be protected. Apart from the intellectual property framework, another possible effort is to take advantage of technological transformation to document, describe and compile this traditional knowledge database into a digitized archive base.

The purpose of digitizing archives is understood as the transfer of analogue data into digital formats and as a series of activities that result in digital copies being available on the internet or other devices. Digitization is a necessity in the current era. Archives must be preserved as cultural property as well as ensuring proof of legal ownership. Archives are one of the important prerequisite documents for intellectual property recognition because they have legal force that can be used as evidence of the existence of local cultural heritage (Hariri 2021). Apart from being authentic evidence of past events, archives are also important evidence in defending the truth.

Methodology

This research was conducted among the Yei tribe, specifically focusing on Kweel Village, not only because the tribal chief and traditional leader of the Yei reside there, but also because Yei culture is centred there and a traditional cultural house, where the indigenous community gathers, stands in this village (Prasetya et al. 2024). To reach Kweel Village, the distance from Merauke City is approximately 180 km (about 4 hours by road). The research was conducted for approximately two months from July to August 2024. The researchers became participant observers who carefully observed various kinds of traditional knowledge practices during the research period. In this location, the traditional knowledge in question is in the context of sago food processing into local food. Given that currently, the Yei tribe's forest area is also faced with a clash of interests in the food security project initiated by the Government in Merauke Regency, which could threaten existing sago forests, this type of unique and valuable traditional knowledge needs to be explored and preserved.

This research is a socio-legal study using an ethnographic study approach as developed by Spradley (1979/2007). Ethnography is an approach that seeks to explore a culture in detail through intensive field research. This study aims to find out how the Yei community organizes their culture and mindset and then uses it as an integral part of daily life. Our task as researchers is to ask questions and summarize explanations from the contents of their minds as the task of an ethnographer is to identify and describe the organization of the knowledge and understandings of a community group. The ethnography we used was realist ethnography, a popular approach that uses a third-person perspective, which reports objectively on the information learned from the research objects on site (Creswell 2015). This approach involves narrating research from a third-person perspective, reporting participants' observations, and their views, then reporting objective data in a form of measurable information, uncontaminated by bias, political goals, and personal judgment. It also involves producing participants' views through edited quotations without changing the meaning and providing conclusions in the form of interpretations and cultural presentations. In our data collection and analysis, respondents revealed that sago as a traditional specialty of the Yei Tribe, has grown naturally (that is, in the wild) since time immemorial and is easily found especially in the environment around the river, which is also in accordance with Ruddle's findings (Ruddle et al. 1978). The age of harvestable sago trees is between 8 to 15 years depending on the location of growth; there is no specific time to harvest because it can be done at any time. At the time of data collection, the researcher selected a family that was harvesting sago in large enough quantities to be stored and processed into daily food. The researcher actively participated in every stage of the activity. In addition, formal and informal interviews

were conducted with tribal chiefs, village heads and local residents to obtain comprehensive information relevant to the research objectives.

Descriptive analysis was used as a means to describe in detail and thoroughly the important findings obtained, thus enabling a better understanding of the facts and interpretation of the phenomena that exist in the Yei Tribe. During the descriptive analysis process, the principle of triangulation was applied to test the validity and credibility of the research findings. This involved cross-checking and re-examining sources and evidence found during the research process.

Results

THE YEI TRIBE AND THE IMPORTANCE OF SAGO

The Yei (also called Yey, Yeinan or Yei Nan) are a small community in Merauke Regency, South Papua Province, bordering neighbouring Papua New Guinea (PNG). The Yei tribe is often referred to as part of the Marind sub-tribe although it differs sharply culturally (Duff-Cooper 1983). This community is spread in six villages, namely Kweel, Bupul, Tanas, Erambu, Toray, and Poo. The customary territory covers the area around the Maro River in the west to several kilometres to the far side of the Flay River in Papua New Guinea. This area is divided into 3 areas including *Yerensiw Kar* as a natural resource utilization area, *Kabekar* as a protected area or the last reserve, *Wankorar* as a settlement area for the Yei tribe (BRWA).

Geographically, the Yei tribe lives in the lowlands which have the following types of landscape, namely jungle/primary/natural forests, savanna fields, and swamp areas. These natural environmental conditions are home to sago plants that breed naturally. This plant is not planted but has existed, growing wild, since the time of their ancestors. Sago, or *sago* itself, means 'starch contained in the stems of sugar palms' (Suroto et al. 2023). This sago plant has grown naturally since time immemorial and is easily found, especially in the environment around swamp/river streams (Ruddle et al. 1978). The age of sago trees at harvest can be mixed with trees between 8 and 15 years old depending on the location of growth; there is no specific time for harvesting because it can be done all year round, according to the needs when consumed. As part of the collective rights, the sago forest can be utilized according to the needs of the community (Ade 2022).

Sago is a local plant that has an important role as a form of food security for local communities as well as part of cultural identity, since time immemorial, as noted above. However, the existence of sago forests, including those in the Yei tribe area, has experienced a shift starting with the non-Papuan migration program to Papua triggering land clearing for settlement and rice fields (Hisa et al. 2017), and the Merauke Integrated Food and Energy Estate (MIFEE) programme launched on 19 February 2010, with the aim of clearing forests for oil palm plantations (Ramadayanti 2020). Gradually, the once-lush forests have been replaced by oil palms. It does not stop there. Currently, a National Strategic Programme has been proposed, with Merauke designated as a Special Economic Zone on 10 October 2023 by the Government, focusing on the development of an integrated food and energy estate spanning 2 million hectares, which also threatens the land and forests, including those owned by the Yei tribe. In response to this programme, the Yei tribe has voiced strong opposition, as it threatens their livelihood, which is heavily dependent on the natural environment and their sago forests (Simanjuntak, et al., 2025).

IDENTIFICATION OF TRADITIONAL KNOWLEDGE OF SAGO FOOD PROCESSING OF THE YEI TRIBE

Sago as a staple food including its processing is an integral part of the Yei culture. This sago food processing process in the Yei community is still found today. As part of traditional knowledge, Yei sago processing includes traditional methods or processes, technical skills, skills and agricultural knowledge. In fact, almost the entire process of making sago into traditional snacks still uses the same materials used by their ancestors.

The processing of sago snacks in the Yei tribe usually involves the nuclear family of husband, wife and unmarried children as the main production unit. In the figures below, Yoseph, his wife and daughter illustrate how this traditional process takes place. They first provide two stalks of nibung leaves (*sote* leaves). His wife deftly showed us the technique and skill of weaving the *sote* leaves. Each "*sote* leaf" is woven using a double cross weaving technique that crosses each other diagonally until all the "*sote* leaves" are folded together and close to the end of the stalk.

The two stalks of *sote* leaves that have been woven are as tall as an adult's body. The woven stalk leaves are called *bugut-bugut*. The function of *bugut-bugut* is to act as a barrier to the pulp of sago pith during the sago smoking process. The process of weaving *bugut-bugut* in the Yei tribe has a different authenticity, as a comparison, for example, with the practice of the Marori tribe, where sago leaf stalks are used as a barrier to sago pith pulp which they then call *pondu* (Hisa et al. 2017). Although there are differences, the Yei also sometimes use sago leaf stalks as *bugut-bugut*.

Figure 1. The process of piercing the *sote* leaf stalk.
Source: Rado 2024

The next traditional process, technique and skill of sago processing is to prepare all the tools and materials related to sago starch production. Tools include axe, machete (*kem*), pangkur (*ambuk*), stick (*kem*/batter), tote bag (*wad*) and plastic bucket. The materials include felled sago stems, the base of sago fronds, sago frond stalks, bamboo (*koptak*), rattan, coconut frond fibres/tapis, *bugut-bugut* and tapis from *sote* leaf stalks (*maibekhele*). Determining the position of the processing location also needs to be considered. A good location needs to be close to a clean water source.

Figure 2. Axe, *kem*, *ambuk*, *kem*/bat, *wad*, and timba.
Source: Rado 2024

Figure 3. Sago *trunk*, *trep*, sago frond stalk, *koptak*, rattan, coconut frond tapis, *bugut-butu*, and *maibekhele*.

Source: Rado 2024

The prepared materials are then arranged according to their respective functions. Yoseph's wife and daughter deftly stake the old sago fronds into the ground. The stalk of the old sago frond is staked vertically and beaten using the blunt part of an *axe*. Then the other end of the sago frond stalk is placed on top of the already staked sago frond stalk diagonally downwards. The long *rattan* is then thrust into the widest part of the sago frond stalk that has been installed diagonally. The *rattan* is positioned across and staked into the ground. The function of the crossed *rattan* is as a barrier so that during the process of beating the starch essence of the sago stem, the container will not collapse to the ground. After the container stands firmly, then *the bugut-bugut* is installed next to the sago frond stalk that has been installed diagonally. The *bugut-bugut* installed next to the sago frond stalks are tied using a blade from a young *koptak*. At both ends of the *bugut-bugut*, coconut frond fibres are placed, which will serve as a filter for the sago starch juice mixed with water. The coconut frond fibres are clamped using two *koptak* sticks. The bottom end of the sago frond stalk that has been installed diagonally is also fitted with a *maibekhele* which functions the same as coconut frond fibres. In addition, a trough (*trep*) is also installed which functions as a container for sago starch mixed with processed water.

Sago processing begins with cutting down sago trees using an axe. The fallen sago tree is separated from the stem and stalk along with the leaves. Then, the sago bark fibres are cleaned from the hard sago bark using a *kem* (beater). After cleaning from the hard sago bark, sago makers in Kweel usually estimate the length of the stem pieces using an axe. The estimated length of the stem pieces is adjusted to the needs. For example, for the needs of a family in the span of the next week, the cutting length can be approximately one metre. Furthermore, the hard sago bark is separated from the starch of the sago stem (the inside of the sago stem) while the separated sago bark will later be used as firewood. The bark that has been separated and leaves only the soft sago starch that is then chopped using an *ambuk*. The chopped sago starch is then placed in the *trep* (trough).

The sago starch that has been collected is then brought to the sago processing container and placed at the top of the sago frond stalk that has been installed diagonally. The sago starch that has been placed is then moistened with water. After that, it is then beaten using a *kem*. Hitting the sago starch using a *kem*/beater requires its own technique, not just hitting, because it can cause sago starch to fly everywhere and to enter the trough (*trep*) which is at the lowest end of the sago frond stalk. The *kem*/beater needs to be

swung behind the body using both hands, slowly. When it is swung forward and hits the sago starch, the *kem*/beater is pulled back first and then lifted again slowly to the back of the body, and so on until the sago starch is completely chopped.

Figure 4. The process of extracting sago starch before milking
Source: Rado 2024

In the next step, the sago starch is squeezed out using both hands. The sago starch is grasped tightly until the water and sago starch come out. The squeezed sago starch is then separated. After all the liquid has been squeezed, the squeezed sago starch is wetted again. This step is repeated three to four times. From this process, we can see the sago starch juice sliding through the cracks of the sieve flowing down the steep slope into the trough (*trep*) at the lowest end of the sago frond stalk. The *trep* collects the sago starch that settles below the water surface. After all the sago starch juice has been milked, the water at the top of the sediment in the *trep* is thrown out and that leaves sticky sago starch under the surface of the *trep*. Next, the sago starch is packed into a tote bag (*wad*) container made from woven *sote* leaves. The weight of sago that has been processed from a sago tree trunk measuring approximately one metre varies between 7 to 12 per kilogram. The sago dregs that are left over can still be utilized, especially for animal food.

Figure 5. The process of milking sago starch juice into sago starch
Source: Rado 2024

The wet sago starch from the processing process is placed in a *wad* and attached to the forehead or head. The sago starch is taken to the house and left to stand until the water is completely gone. The sago starch that has been left to rest is usually dried. In this dry condition, sago starch (sago flour) can be processed into food. After drying, it is then twisted using the palms of both hands, this is done to produce more sago flour. The twisting process does not have to be smooth.

One type of sago snack from the Yei tribe was introduced to us, called sago *kubaaze*. This dish is quite simple, because it does not require any mixture other than dried sago wrapped in reed leaves and tied with *sote* leaves and then burned over the coals of the hard sago bark. The sago bark that is to be burned is piled on the ground, and on top of it a grill is made of four dry wooden sticks stuck into the ground or commonly termed *parah-parah*. The burning process does not take long. When the leaves of the wrapper are slightly blackened, this snack can be removed and served. The serving process can be enjoyed together with *sembilang* fish which is abundant in the swamps behind Kweel Village. In addition, the sago staple can produce various processed products, both soupy and dry, including *papeda*, sago *sep*, and sago plate.

For the Yei tribe, sago snacks are something very valuable (Suroto 2014), not just as traditional snacks but also to ensure food security (Fahmi et al. 2023). For them, sago is everything. We were able to observe the whole process, most of which comes from processing the sago tree. This plant is used in this way to support the food affairs of the Yei tribe. Their efforts to preserve the sago tree by starting from cultivation and going through to utilization demonstrates how they care for their survival and culture. Basically, the Yei people just want to survive and pass on their traditional knowledge to the next generation even in the midst of the flow of investment that has encroached on their customary forests today.

Discussion

PROTECTION OF TRADITIONAL KNOWLEDGE OF YEI TRIBE SAGO FOOD PROCESSING BASED ON DIGITALIZATION

Traditional knowledge wealth in Indonesia is still not fully sovereign (Koto 2023), at a time when countries in other parts of the world are competing to register all their communal intellectual property. In contrast, in Indonesia, an integrated national data centre is not yet fully accessible, let alone registered. Currently, the cultural heritage database is still scattered, making it difficult for the community (Adawiyah & Rumawi, 2021) to record their knowledge. Therefore, the government should provide protection through efforts to inventory, preserve, and maintain traditional knowledge.

This inventory of traditional knowledge should be recorded and integrated through the communal intellectual property database (Direktorat Jenderal Kekayaan Intelektual Kementerian 2024). However, investigation has shown that until now this inventory does not contain a full record, nor are the records necessarily adequate. A total of only 494 traditional knowledge data are registered, which is very small compared to the amount of traditional knowledge in Indonesia. One that has not yet been recorded and registered is the inclusive moral rights held by the Yei tribe in the form of traditional knowledge of local food processing from the sago tree.

Exploration and identification of processing in the Yei tribe has shown that this processing practice is still maintained, developed and passed down from generation to generation. As affirmed by Article 1 point 3 of Government Regulation Number 56 of 2022 on Community Intellectual Property, traditional knowledge is all ideas and notions in society, which contain local values as a result of real experiences in interacting with the environment, developed continuously, and passed on to the next generation. The fields of traditional knowledge include: (a) traditional methods or processes; (b) technical skills; (c) skills; (d) learning; (e) agricultural knowledge; (f) technical knowledge; (g) ecological knowledge; (h) knowledge related to genetic resources; (i) medicinal knowledge, traditional medicine, and healing procedures; (j) economic systems; (k) social organization systems; (l) knowledge related to behaviour regarding nature and the universe; and/or (m) other forms of knowledge according to development according to the Government Regulation of the Republic of Indonesia Number 56 of 2022 concerning Communal Intellectual Property (Republic of Indonesia 2022).

Referring to this, it is not an exaggeration that the Yei tribe's sago processing is a field that fulfills the elements of traditional knowledge protected in Indonesian laws and regulations. Protection as traditional knowledge when viewed from the elements regulated in the Government Regulation on Communal Intellectual Property refers to several fields of knowledge, including traditional methods or processes, technical skills, skills and/or agricultural knowledge. In fact, the Law on the Promotion of Culture is categorized as "traditional food" (Republic of Indonesia 2017). This statement aims to protect the cultural rights of the Yei tribe in order to achieve prosperity and justice in the eyes of the law.

In accordance with the idea of legal protection, every record of traditional knowledge practices should be compiled into a digital database. This responds to the progress of the globalization era which is characterized by rapid dynamics in the digital world (Sulistianingsih et al. 2021). Rapid changes demand innovation, including in the field of communal intellectual property on traditional knowledge. In addition to the fact that there is still a lack of recording of traditional knowledge, the awareness of storing digitally-based archival documents should be encouraged (Reddy 2006; Hirwade & Hirwade 2012; Balogun & Kalusopa 2021). Digitization efforts are not only a means of publishing information to the domestic and foreign public but also the first step for registration in the communal intellectual property database (Hariri 2021).

Other reasons why preservation and documentation of traditional knowledge based on digitized archives are considered necessary are: First, *accessibility*: there is ease of implementation when digitized to protect traditional knowledge, ensure long-term access and sustainability, (Huang et al. 2015; Seal & Gargate 2024) and to reduce the risk of damage, theft and extinction of traditional knowledge. Second, *processing methods*: for example, the traditional sago processing process includes the mechanism of logging, smoking, squeezing sago starch juice (Singhal et al., 2008) to make it a snack, all of which have unique technical skills in these traditional practices so that it remains important to be archived (Sidiq et al. 2022). Third, *cultural integration*: cultural integration helps preserve traditional knowledge that will be passed on from generation to generation. And fourth, *cultural promotion*: making sago food processing as a cultural promotion event so that it can reach a wider audience and possibly become one of the sources of improving the welfare of the community communally.

Conclusion

Identification of the Yei tribe's sago food processing practices, usually carried out involving the nuclear family as the main production unit, has shown that they have been on-going and have even become a marker of cultural identity from the past until now. In Indonesian law, traditional knowledge is regulated under two different legal regimes: (1) the regime of copyright, patent rights, and communal intellectual property rights, which affirms that the processing of sago includes technical practices/skills/expertise. Meanwhile, (2) the cultural advancement regime refers to it solely as traditional knowledge within the category of traditional food. The processing of sago by the Yei tribe has fulfilled the elements of protection as stipulated in the provisions regarding the protection of traditional knowledge. Intellectual property rights provisions protect methods or processes and skills, including in sago processing. Sago, apart from being a source of food security, is also an aspect of cultural promotion that needs to be protected. In addition, strategic steps in facing the progress of the globalization era now require documentation and publication efforts on the processing of sago snacks into a digitized archive base as the basis for ownership rights, dissemination of information to the public sphere, long-term preservation and mitigation of loss or extinction of valuable traditional knowledge. This will ensure that this culture can be passed down and enjoyed by future generations in a sustainable manner.

References

Adawiyah, R. & Rumawi, R. 2021, 'Pengaturan Hak Kekayaan Intelektual dalam Masyarakat Komunal di Indonesia', *Repertorium: Jurnal Ilmiah Hukum Kenotariatan*, vol. 10, no. 1, 1–16.

Ade, A. M. 2022, *Sagu Nusantara*, Samudra Biru, Krembung, Indonesia.

Arif, A. 2019, *Sagu Papua untuk Dunia*, Kepustakaan Populer Gramedia, Jakarta, Indonesia.

Badan Registrasi Wilayah Adat (BRWA) 2024, 'Wilayah Adat Yei'Man' [Customary territory], *BRWA*, https://brwa.or.id/wa/view/T1FpLTJkUWtVMXM

Balogun, T. & Kalusopa, T. 2021, 'A framework for digital preservation of Indigenous knowledge system (IKS) in repositories in South Africa', *Records Management Journal*, vol. 31, no. 2, pp. 176–196. https://doi.org/10.1108/RMJ-12-2020-0042

Baswedan, A., Srihadi, E., Yusuf, A., Koban, A. W. & Yuda, A.R. H. 2010, 'Laporan Utama: Menelusuri Konflik Indonesia-Malaysia', *Update Indonesia*, vol. V, no. 6. https://theindonesianinstitute.com/wp-content/uploads/2014/03/Update-Indonesia-Volume-V-No.-06-Oktober-2010-Bahasa-Indonesia.pdf

Creswell, J. W. 2015, *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, Pearson, New York, NY.

Direktorat Jenderal Kekayaan Intelektual Kementerian Hukum dan HAM RI 2024, 'traditional knowledge', *KIKOMUNAL,*. https://kikomunal-indonesia.dgip.go.id/home/explore/traditional

Duff-Cooper, A. 1983, 'Review of: Baal, J. Van: J*an Verschueren's Description of Yéi-nan Culture*', *Journal of the Anthropological Society of Oxford*, vol. 14, no. 2, pp. 259-261.

Fahmi, M. S., Rado, R. H., Klau, R. G. & Utami, G. A. 2023, 'Enhancing national food security by protecting intellectual property rights for farmers in breeding local plant varieties', *IOP Conference Series: Earth and Environmental Science*, vol. 1253, no. 1, article no. 012073. https://doi.org/10.1088/1755-1315/1253/1/012073

Hariri, A. 2021, 'Digitalization of Intangible Cultural Heritage (ICH) archives as legal protection of Intellectual Property Rights', *Khizanah Al-Hikmah: Jurnal Ilmu Perpustakaan, Informasi, Dan Kearsipan*, vol. 9, no. 2, pp. 145–156. https://doi.org/10.24252/kah.v9i2a7

Hirwade, M. & Hirwade, A. 2012, 'Traditional knowledge protection: an Indian prospective', *DESIDOC Journal of Library & Information Technology*, vol. 32, no. 3, pp. 240-248. https://doi.org/10.14429/djlit.32.3.2381

Hisa, L., Mahuze, A. & Arka, I. W. 2017, 'Dokumentasi Etnobotani-Linguistik Tumbuhan Sagu: Laporan Awal dari Etnis Marori di Taman Nasional Wasur Merauke', *Linguistik Indonesia*, vol. 35, no. 2, pp. 187–200. https://doi.org/10.26499/li.v35i2.69

Huang, Y.-M., Chen, M.-Y. & Mo, S.-S. 2015, 'How do we inspire people to contact aboriginal culture with Web2.0 technology?' *Computers & Education*, vol. 86, pp. 71–83. https://doi.org/10.1016/j.compedu.2015.03.001

Koto, I. 2023, 'Perkembangan Hak Kekayaan Intelektual Komunal di Indonesia', *Seminar Nasional Hukum, Sosial Dan Ekonomi*, vol. 2, no. 1, pp. 167–173. https://jurnal.umsu.ac.id/index.php/sanksi/article/view/14324

Kurnianingrum, T. P. 2020, Pelindungan Hukum Atas Pengetahuan Obat Tradisional. *Kajian*, *23*(2), 111–128.

Kusumadara, A. 2011, 'Pemeliharaan dan Pelestarian Pengetahuan Tradisional dan Ekspresi Budaya Tradisional Indonesia: Perlindungan Hak Kekayaan Intelektual dan non-Hak Kekayaan intelektual', *Jurnal Hukum Ius Quia Iustum*, vol. 18, no. 1, pp. 20–41. https://doi.org/10.20885/iustum.vol18.iss1.art2

Liu, Y. 2003, 'IPR protection for new traditional knowledge: With a case study of traditional Chinese medicine', *European Intellectual Property Review*, vol. 25, pp. 194-199.

Nugroho, T. A. 2024, 'Politik Hukum Kekayaan Intelektual Komunal dalam Sistem Hukum Nasional', *Jurnal De Lege Ferenda Trisakti*, vol. 2, no.1, pp. 57–66. https://doi.org/10.25105/ferenda.v2i1.19702

Prasetya, M. N., Nisfur, A. & Adam, A. F. 2024, 'Penerapan E-Government Untuk Peningkatan Pelayanan Publik dan Potensi Desa di Kampung Kweel Kabupaten Merauke', *JURNAL Pengabdian Kepada Masyarakat*, vol. 14, no. 1, pp. 129–134. https://ojs.uninus.ac.id/index.php/JPKM/issue/view/316

Prathama, A. A. G. A. I., Onassis, K. R. M. & Komara, I. G. A. M. D. 2023, 'Perlindungan Hukum Atas Hak Kekayaan Intelektual Komunal Dalam Masyarakat Bali', *Jurnal Ilmiah Raad Kertha*, vol. 6, no. 1, pp. 21–33. https://doi.org/10.47532/jirk.v6i1.823

Purwanda, S., Rado, R. H., Susanti, D. S., Zainuddin, A., & Syahril, M. A. F. 2024, 'Legal protection of Yei People's knowledge of local medicines and medicinal plants from extinction', *Masalah-Masalah Hukum*, vol. 53, no. 3, pp. 245–256. https://doi.org/10.14710/mmh.53.3.2024.245-256

Putri, R. W., Putri, Y. M., & Sabatira, F. 2024, 'Exploring the discourse of subject in intellectual property rights: Communal rights in Indonesia', *Simbur Cahaya*, vol. 30, no. 2, pp. 243–255. https://doi.org/10.28946/sc.v30i2.2903

Ramadayanti, E. 2020, 'Upaya Perlindungan Hak Masyarakat Adat Setelah Satu Dasawarsa Program MIFEE (Merauke Integrated Food and Energy Estate) melalui Citizen Law Suit', *Jurnal Padjajaran Law Review*, vol. 8, no. 2, pp. 18–20. https://jurnal.fh.unpad.ac.id/index.php/plr/article/view/397

Reddy, S. 2006, 'Making heritage legible: Who owns traditional medical knowledge?' *International Journal of Cultural Property*, vol. 13, no. 2, pp. 161–188. https://doi.org/10.1017/S0940739106060115

Republic of Indonesia 2011, Ministry of Law and Human Rights, Legal Review Team on the Protection of Local Plant Varieties in National and International Law *Perlindungan Varietas Tanaman Lokal Dalam Hukum Nasional dan Internasional*, Badan Pembinaan Hukum Nasional Kementerian Hukum dan Hak Asasi Manusia, Jakarta. https://bphn.go.id/data/documents/pkj-2011-15.pdf

Republic of Indonesia 2017, *Undang-Undang Nomor 5 Tahun 2017 Tentang Pemajuan Kebudayaan*. www.koalisiseni.or.id/regulasi/

Republic of Indonesia 2022, *Peraturan Pemerintah Republik Indonesia Nomor 56 Tahun 2022 Tentang Kekayaan Intelektual Komunal*. [Government Regulation Number 56 of 2022 Concerning Communal Intellectual Property] https://jdih.dgip.go.id/produk_hukum/view/id/116/t/peraturan+pemerintah+nomor+56+tahun+2022+tentang+kekayaan+intelektual+komunal

Republic of Indonesia, Sekretariat Direktorat Jenderal Perkebunan, 2021, Plantation Statistics.

Republic of Indonesia, Sekretariat Direktorat Jenderal Perkebunan 2021, Statistik Perkebunan Unggulan Nasional 2020-2022, pp. 789-835. [Statistics of National Leading Estate Crops Commodity 2020-2022, List of Sago Tables]. https://ditjenbun.pertanian.go.id/template/uploads/2022/08/STATISTIK-UNGGULAN-2020-2022.pdf

Ridwan, A. M. 2018, 'Perlindungan Pengetahuan Tradisional Terkait dengan Keanekaraaman Hayati di Indonesia', *Pemuliaan Hukum*, 1, no. 1, pp. 97-124. https://doi.org/10.30999/jph.v1i1

Ruddle, K., Johnson, D., Townsend, P. K. & Rees, J. D. 1978, *Palm Sago: A Tropical Starch from Marginal Lands*. Published for the East-West Center by The University Press of Hawaii. https://doi.org/10.1017/S0014479700010437

Sardjono, A. 2012, Culture and Intellectual Property Development in Indonesia. *Indonesian Journal of International Law.*, vol. 10, no. 1, article 2. https://doi.org/10.17304/ijil.vol10.1.284

Seal, R. & Gargate, G. 2024, Role of technology in the preservation and protection of traditional knowledge traditional knowledge management -The way to riches. *2024 Portland International Conference on Management of Engineering and Technology (PICMET)*, 1–9. https://doi.org/10.23919/PICMET64035.2024.10653179

Septarina, M. 2016, 'Perlindungan Hukum Pengetahuan Tradisional Dalam Konsep Hukum Kekayaan Intelektual', *Al-Adl: Jurnal Hukum*, vol. 8, no. 2, pp. 45-62. https://doi.org/10.31602/al-adl.v8i2.457

Sidiq, F. F., Coles, D., Hubbard, C., Clark, B. & Frewer, L. J. 2022, 'Factors influencing consumption of traditional diets: stakeholder views regarding sago consumption among the indigenous peoples of West Papua', *Agriculture & Food Security*, vol. 11, no. 1, article no. 51. https://doi.org/10.1186/s40066-022-00390-5

Simanjuntak, M., Makuba, N., Syarif, N., Alexande, H., Gorga, M. M., & Aprila Hero. 2025, Masyarakat Adat di Pusaran Proyek Raksasa. In *Rumah AMAN Media Informasi & Komunikasi Masyarakat Adat*. https://aman.or.id/files/gaung/94406Gaung%20AMAN%20-%20Jan-April%202025_.pdf

Singhal, R. S., Kennedy, J. F., Gopalakrishnan, S. M., Kaczmarek, A., Knill, C. J. & Akmar, P. F. 2008, 'Industrial production, processing, and utilization of sago palm-derived products', *Carbohydrate Polymers*, vol. 72, no. 1, pp. 1–20. https://doi.org/10.1016/j.carbpol.2007.07.043

Spradley, J. P. 1979/2007, *The Ethnography Interview*. Elizabeth, M. Z. (interpreter), *Metode Etnografi*, 2nd ed. Tiara Wacana,Yogyakarta.

Sulistianingsih, D., Adhi, Y. P. & Pujiono, P. 2021, 'Digitalisasi Kekayaan Intelektual Komunal di Indonesia: Digitalization of Communal Intellectual Property in Indonesia', *Seminar Nasional Hukum Universitas Negeri Semarang*, vol. 7, no. 2, pp. 645–656. https://doi.org/10.15294/snhunnes.v7i2.723

Suroto, H. 2014, 'Babi dalam Budaya Papua', (Pig in the Papua Culture) *Jurnal Penelitian Arkeologi Papua Dan Papua Barat*, vol. 6, no. 1, pp. 37–44. https://doi.org/10.24832/papua.v6i1.41

Suroto, H., Maryone, R. & Salhuteru, M. 2023, 'Budaya Sagu di Papua dari Masa Prasejarah Hingga Masa Kini', *Naditira Widya*, vol. 17, no. 1, pp. 57–66. https://doi.org/10.24832/nw.v17i1.526

Susanti, D. I. 2022, 'Eksplorasi Perlindungan Kekayaan Intelektual Komunal Berbasis Hak Asasi Manusia' *Media Iuris*, vol. 5, no. 3, pp. 401-428. https://doi.org/10.20473/mi.v5i3.40174