Ritual ecology and biocultural diversity in the *Jolenan* tradition of Somongari, Java, Indonesia: An ethnobiological study of ritual flora and fauna

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Research

Abstract

Background: Indigenous ritual practices play an important role in maintaining biocultural diversity by embedding ecological knowledge within cultural and spiritual systems. However, many local traditions in Southeast Asia remain underrepresented in ethnobiological studies. This research examines the *Jolenan* tradition of the Javanese community in Somongari, Indonesia, as a form of ritualized utilization of biodiversity and indigenous knowledge.

Methods: Qualitative ethnographic methods were applied through participant observation, semi-structured interviews, and documentation involving 18 informants. The study focused on identifying plant and animal resources used in ritual offerings (*ubarampe*) and interpreting their symbolic meanings.

Results: A total of 22 species from 15 families were documented in ritual offerings used in the *Jolenan* tradition. The findings show that biological resources were selected not only for practical purposes but also for symbolic values related to gratitude, protection, harmony, prosperity, and cosmological balance. Various plant species, agricultural products, and animal-derived materials represent the close relationship between humans, nature, and spirituality. The ritual also functions as a mechanism for transmitting indigenous knowledge and cultural values across generations.

Conclusions: The *Jolenan* tradition reflects a sophisticated system of ritual ecology in which biodiversity utilization is closely linked to cultural and spiritual values. This study highlights the importance of indigenous ritual practices in supporting biocultural conservation and preserving indigenous knowledge relevant to sustainability discourse.

Keywords: ethnobiology; indigenous knowledge; biodiversity; ritual tradition; *jolenan*

Background

Ritual practices of spiritual gratitude play a crucial role in shaping relationships between humans, nature, and the spiritual realm, while simultaneously sustaining biocultural diversity. In many traditional societies, such practices are not merely symbolic but constitute complex systems of knowledge that regulate interactions between humans, nature, and unseen

forces. These practices reflect indigenous knowledge systems that integrate ecological understanding with cultural values and belief structures and are increasingly conceptualized within the framework of ritual ecology.

Indigenous knowledge encompasses principles, skills, practices, rituals, and customs developed by specific communities and transmitted across generations (Adam *et al.* 2019; Adinugraha, 2024; Arce and Cerdas, 2019; Ksenofontov *et al.* 2019; Sujarwo *et al.* 2020). In many traditional societies, ritual practices involving plants and animals serve not only spiritual purposes but also reflect ecological awareness and cultural identity (Adinugraha *et al.* 2024; Arce and Cerdas, 2019; Sujarwo *et al.* 2020). This form of indigenous knowledge emerges and is sustained within particular indigenous or ethnic communities, where cultural identity and ecological practices are closely intertwined.

Across different regions of the world, including Africa, Latin America, and Asia, ritual practices involving biological resources have been shown to contribute to the maintenance of biocultural diversity and reinforce human–nature relationships (Ndemanu, 2018; Ogar *et al.* 2020; Salmi *et al.* 2018). However, despite increasing scientific attention, many local ritual traditions remain underrepresented in ethnobiological research, particularly in understanding how spiritual values shape the use of biodiversity and its symbolic meanings. This gap is also evident in the Indonesian context.

In Indonesia, the Javanese people represent the largest ethnic group, comprising 40.05% of the total population (BPS, 2015). Javanese communities, particularly in rural areas, have long maintained local traditions that embody noble spiritual and ethical values (Adinugraha *et al.* 2024; Permanasari, 2017; Yuningtyas *et al.* 2020). However, the continuity of these traditions is increasingly threatened as modernization reduces community engagement, especially among younger generations, thereby eroding cultural practices and ethical values (Kismini *et al.* 2019). One of the most prominent expressions of these values is the practice of thanksgiving rituals.

Several studies have documented Javanese thanksgiving rituals, such as *Tingkeban* (Austiyana, 2021), *Slametan* (Nasir, 2019), *Ngalab* blessing rituals (Sulistyorini *et al.* 2022), and the use of plants and animals as *ubarampe* in the *Kepungan* tradition (Adinugraha *et al.* 2024). One example of indigenous ritual practice is the *Jolenan* Somongari tradition, which is performed biennially by the Javanese community in Somongari Village. This ritual represents a form of spiritual gratitude for divine blessings while maintaining harmony among the human, natural, and spiritual domains.

This Thanksgiving ritual involves the preparation and procession of *Jolen*, a ritual structure composed of *ubarampe* (offerings) derived from the surrounding biodiversity. *Ubarampe,* or offerings are ceremonial objects prepared from plants, fungi, and animals obtained from the local environment and are central to ritual performances due to their symbolic meanings (Adinugraha, 2024; Adinugraha *et al.* 2024; Arce and Cerdas, 2019; Salmi *et al.* 2018; Sujarwo *et al.* 2020). These offerings are dedicated to God, ancestors, and other spiritual entities as expressions of gratitude, protection, and harmony (Adinugraha *et al.* 2024; Astina *et al.* 2021; Ndemanu, 2018; Saddhono *et al.* 2019).

However, these studies generally emphasize descriptive accounts of ritual practices, with limited attention to how biodiversity utilization is embedded within systems of spiritual meaning and ritual ecology. Furthermore, the *Jolenan* Somongari tradition has not yet been systematically examined from an integrative ethnobiological perspective that connects biological resources, symbolic interpretation, and spiritual values.

The knowledge underpinning the selection, preparation, and symbolic interpretation of these *ubarampe* is embedded within indigenous knowledge systems maintained by the local community. This knowledge develops within specific cultural groups and is closely tied to local ecological contexts and ritual practices. Despite its cultural and biological significance, indigenous knowledge related to ritual practices is primarily transmitted orally through demonstrations and communal participation, making it vulnerable to loss and often receiving less recognition compared to Western scientific knowledge systems (Ogar *et al.* 2020).

Therefore, this study aims to investigate the *Jolenan* Somongari tradition, focusing on ritual practices, the use of plants and animals in Jolen, and associated spiritual values. By positioning this study within the framework of ritual ecology and biocultural diversity, this research seeks to contribute to broader discussions on how indigenous knowledge sustains human–nature–spiritual relationships. Documenting this tradition in written form is essential for preserving indigenous knowledge and recognizing its contribution as a complement to Western science (Adinugraha *et al.* 2025; Chakrabarty, 2024; Wilder *et al.* 2016). In addition, this study highlights the role of ritual practices in supporting biodiversity conservation and cultural continuity amid ongoing socio-cultural change.

Theoretical Background

Indigenous knowledge is rooted in ancestral wisdom developed and sustained over long periods of interaction among communities, culture, and nature (Ali, 2021; Cajete, 2020). This knowledge is typically transmitted orally from generation to generation and embedded in the daily practices, beliefs, and traditions of indigenous peoples (Ogar *et al.* 2020). Indigenous knowledge continues to exist among communities that actively believe in, practice, and preserve it as part of their cultural identity (Gonçalves *et al.* 2021; Ishtiaq *et al.* 2013; Kosoe *et al.* 2020). One such community is the Javanese people of Somongari Village, Purworejo Regency, Indonesia, whose indigenous knowledge is manifested in local traditions passed down orally, including the *Jolenan* Somongari ritual.

Indigenous knowledge plays a significant role in biodiversity conservation and environmental sustainability. Numerous studies have shown that indigenous knowledge systems contribute effectively to the protection and sustainable management of biodiversity and ecosystems (Adom, 2022; Ali, 2021; Kosoe *et al.* 2020; Ogar *et al.* 2020). As direct users of biological resources, indigenous peoples possess ecological knowledge that enables them to utilize biodiversity while maintaining ecological balance (Gardner *et al.* 2022; Ntoko and Schmidt, 2021). Through long-term interaction with their environment, indigenous communities have developed value systems and practices that emphasize harmony between humans and nature (Gonçalves *et al.* 2021; Kosoe *et al.* 2020).

The study of indigenous knowledge related to biodiversity can be approached through ethnobiology. Ethnobiology originated as the study of biological knowledge and practices of different societies through an ethnological perspective (Clément, 1998). It is defined as a scientific field that examines the dynamic relationships between humans, biota, and the environment (Albuquerque and Alves, 2016; Quave *et al.* 2015). As a transdisciplinary discipline, ethnobiology integrates methods from biological taxonomy, anthropology, ecology, cognitive science, and political ecology to understand human–environment interactions (Ludwig, 2018).

Ethnobiological research focuses on past and present interactions between societies and their biological environment, encompassing botany, zoology, anthropology, ecology, and history (Medeiros, 2014). From an axiological perspective, ethnobiology aims to document local nomenclature and classification systems, interpret cultural meanings and management of biological resources, identify preferred or avoided species, and analyze the biological consequences of human interventions on species and populations (Casas *et al.* 2015). Therefore, integrating indigenous knowledge through an ethnobiological approach is essential to support biodiversity-related learning and promote sustainable environmental awareness. In this context, ritual ecology emerges as a framework that explains how biodiversity utilization, spiritual beliefs, and cultural practices are interconnected in maintaining harmonious human–nature relationships within indigenous communities. Figure 1 presents the theoretical background of this study.

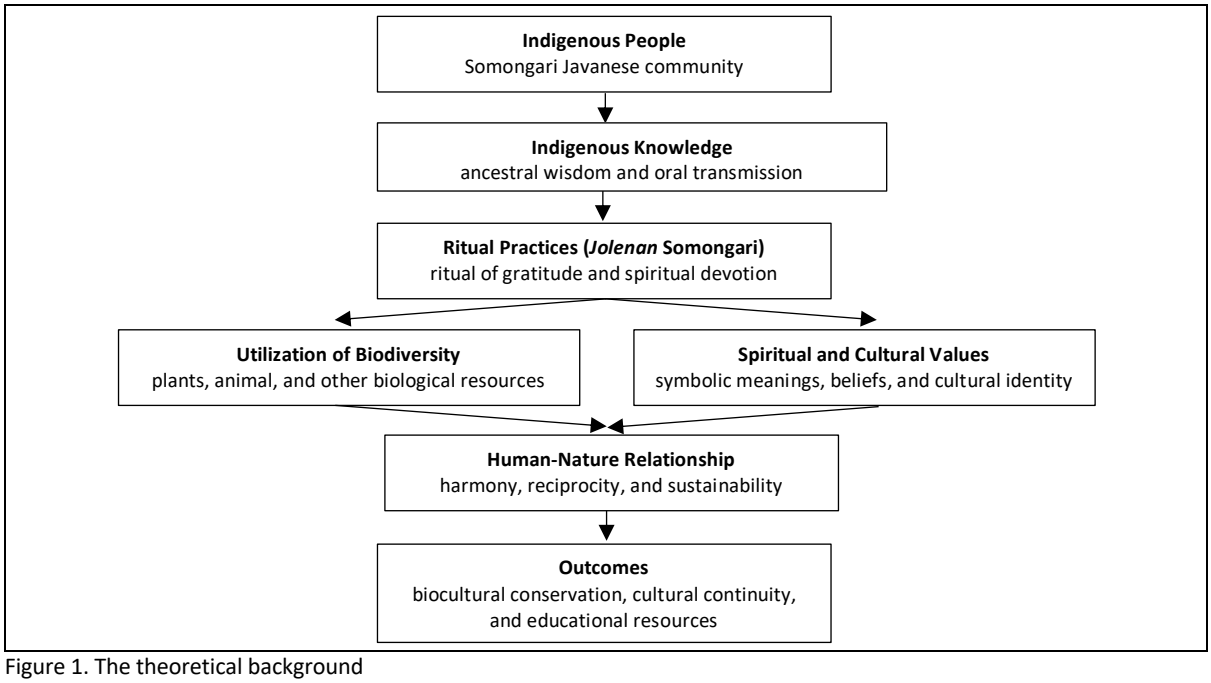

Figure 1. The theoretical background

Materials and Methods

Study area

The research method employed field exploration techniques, including interviews, observations, and documentation, in Somongari village, Purworejo Regency, Central Java Province, Indonesia, in September 2023. Somongari Village is located at $7^0$45'55 south latitude and $110^0$4'18 east longitude (Pemdes Somongari, 2021). The study comprised three steps: observing and documenting the preparation and implementation of *Jolenan*, conducting interviews, and analyzing the interview data using data reduction techniques.

Data Collection

The collected data included a description of *Jolenan* Somongari, the use of biodiversity in the form of *ubarampe* or offerings in *Jolen*, and the noble spiritual value of *Jolenan* Somongari. The data collection was based on the book by Albuquerque et al. (2014). The research site is depicted in Figure 2.

Data describing the *Jolen* and *Jolenan* Somongari tradition were collected through field-based qualitative methods, including interviews, observations, and documentation. A total of 15 village informants who were directly involved in preparing the *Jolenan* ritual participated in this study, along with three key informants who possessed in-depth knowledge of the tradition (Figure 2). Semi-structured interviews were conducted to explore the history of *Jolenan*, the preparation process, and the ritual's implementation.

Observations focused on the preparation activities leading up to the Jolenan Somongari ritual, particularly the making of *ubarampe* or offerings that comprise the Jolen. Documentation included photographs, field notes, and audiovisual recordings to support data triangulation. Additional interviews were conducted after the ritual to complement the observational findings.

Data on biodiversity utilization for *ubarampe* were collected through observations and interviews with village and key informants to identify the plant and animal species used in the ritual and their roles in Jolen preparation. To further explore the spiritual values embedded in the ritual, in-depth interviews were conducted with three key informants, since most village informants understood *Jolenan* only as a general expression of gratitude and lacked detailed knowledge of its symbolic meanings.

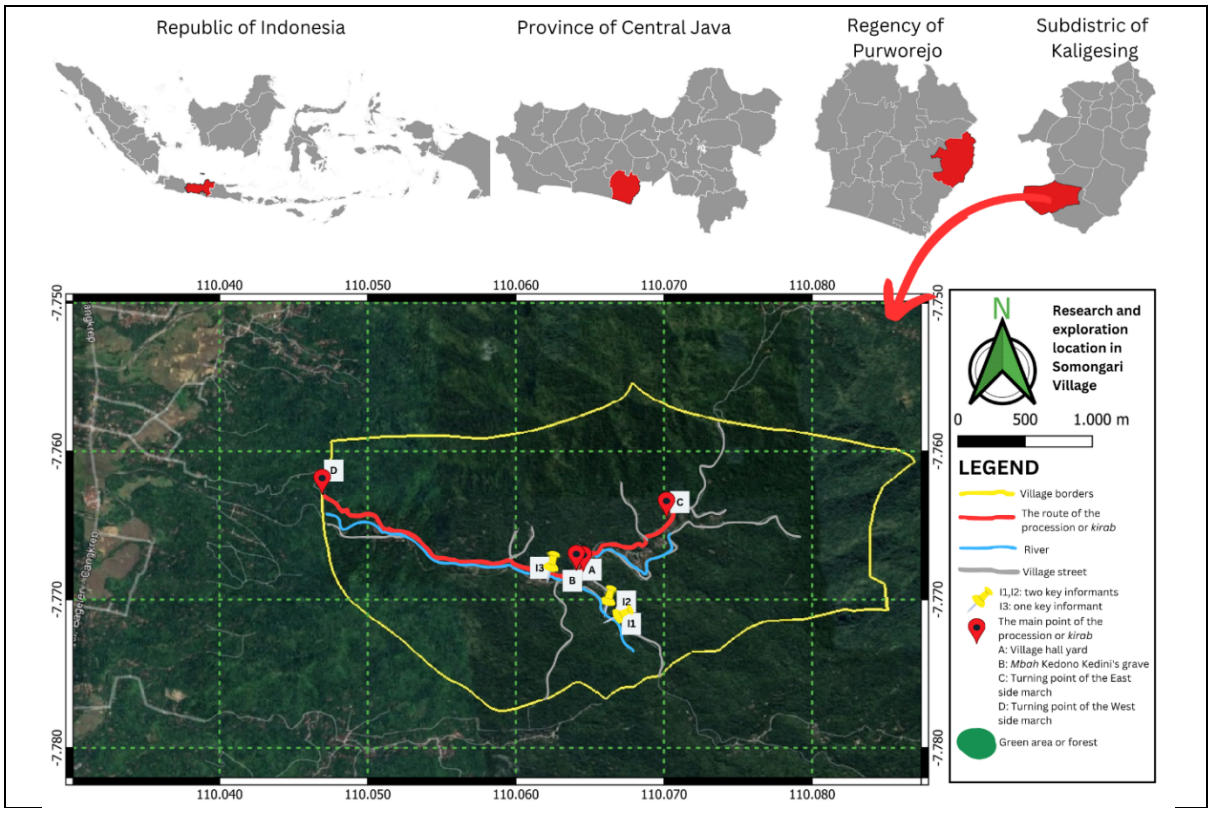

Figure 2. Research and exploration location in Somongari Village

Data Analysis

Qualitative data were analyzed using descriptive qualitative methods. Interview transcripts and observational notes were subjected to data reduction through coding similar information, domain analysis, identification of relationships among domains, and summarization of key findings (Cohen *et al.* 2018). Inconsistent or contradictory information was identified and examined to strengthen data validity. Local Javanese terms were preserved in their original form throughout the analysis, as they represent an essential component of indigenous knowledge and were not translated into English or Indonesian.

Data on plant and animal utilization were cross-checked against relevant literature to verify species identification and documented uses in ethnobiological studies, journals, and reference books. The analysis of spiritual values focused on interpreting symbolic meanings derived from key informant narratives.

The analyzed data were subsequently used to develop an educational video on *Jolenan* Somongari. Video production followed three stages: determining the educational objectives, compiling research-based content, and developing a storyboard (Buchner, 2018). The video was edited in a video editing application and uploaded to YouTube as an educational resource.

Results

***Jolen* in the Ritual of *Jolenan* Somongari**

According to village government data, Somongari Village covers 8.95 km² and is predominantly inhabited by the Javanese community. The village is located in the Menoreh Mountains and is crossed by three rivers. The total population is 2,861 people, with 98.60% adhering to Islam and 1.40% to Protestant Christianity (Pemdes Somongari, 2021). Indigenous knowledge in Somongari Village reflects an acculturation between Islamic teachings and older Javanese cultural traditions. According to informants, traces of ancestral beliefs, including Hindu and Javanese spirituality, remain evident in ritual offerings and the determination of ritual dates. However, prayers are currently performed according to Islamic procedures.

Jolenan Somongari is a traditional ritual conducted every two years during the month of *Sapar* in the Javanese calendar. The ritual is usually held on *Selasa Wage* (Tuesday *Wage*), and if no *Selasa Wage* occurs during *Sapar*, it is performed on Tuesday *Pon*. According to informants, the tradition is believed to have originated from the Majapahit Kingdom and later continued during the Mataram Kingdom period. This historical continuity is reflected in the continued use of the Javanese calendar to determine ritual schedules. Somongari Village itself is estimated to have been established between 1820 and 1850 during the reign of the village lurah.

The *Jolenan* tradition involves the construction and procession of Jolen through the village streets. Jolen is a rectangular pyramid-shaped structure composed of various *ubarampe*, or ritual offerings. Informants explained that *Jolenan* was first introduced by Mbah Somongari, the *pepundhen*, or revered ancestor, who founded the village. Other important *pepundhen* include Mbah Kedono Kedini and Mbah Beroek Singonegoro, who are believed to have transmitted ritual knowledge and village traditions to later generations.

Jolenan Somongari is regarded as the largest traditional ritual in Somongari Village. The event encourages relatives and family members who have migrated to return to the village and strengthens social relationships among community members. The ritual observed in this study was conducted on Tuesday *Wage*, September 5, 2023. Prior to the procession, villagers prepared the Jolen and its *ubarampe* collectively. The preparation stages of *Jolenan* Somongari are presented in Figure 3.

The preparation of *Jolenan* consists of five stages: constructing and decorating the Jolen frame, preparing ritual foods, gathering the *ubarampe* and conducting communal prayers, arranging the *ubarampe* within and outside the Jolen, and bringing the completed Jolen to the village hall field. The *Jolen* frame is constructed from bamboo, banana stems, and woven *aren* leaves, forming a rectangular pyramid approximately 80 cm in length and width and 150 cm in height (Figure 4). Each *Rukun Tetangga* (RT), a smaller neighborhood administrative unit within the village, generally prepares one or more Jolen, resulting in more than 40 Jolen displayed during the ritual procession.

Figure 3. *Jolen* preparation. (a) making the *Jolen* frame; (b) the *Jolen* frame was ready to be equipped with other *ubarampe*, or offerings; (c) preparing food-based *ubarampe* to be placed inside the *Jolen*; (d) making the food that was hung on the *Jolen*; (e) various ethnic foods placed inside the *Jolen*; (f) adding the *ubarampe* on the outside of the Jolen; (g) putting the *ubarampe* inside the Jolen; (g) the ready Jolen was taken to the village hall field; (h) collecting the Jolen to the village field; (i) assembling the *Jolen* at the village hall field.

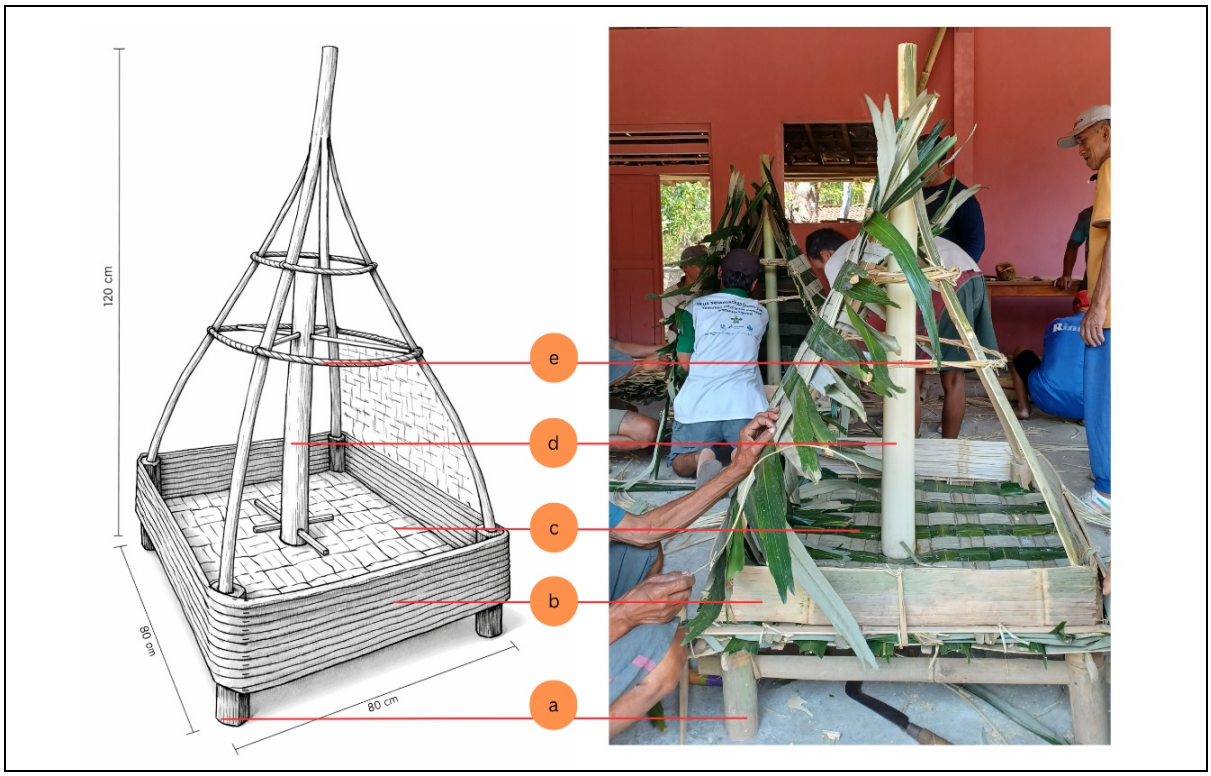

Figure 4. The frame of the *Jolen*. (a) bamboo strips; (b) thinly sliced bamboo; (c) *bleketepe,* a woven ornament made from *aren* palm leaves; (d) banana stems; (e) thinly sliced and twisted bamboo.

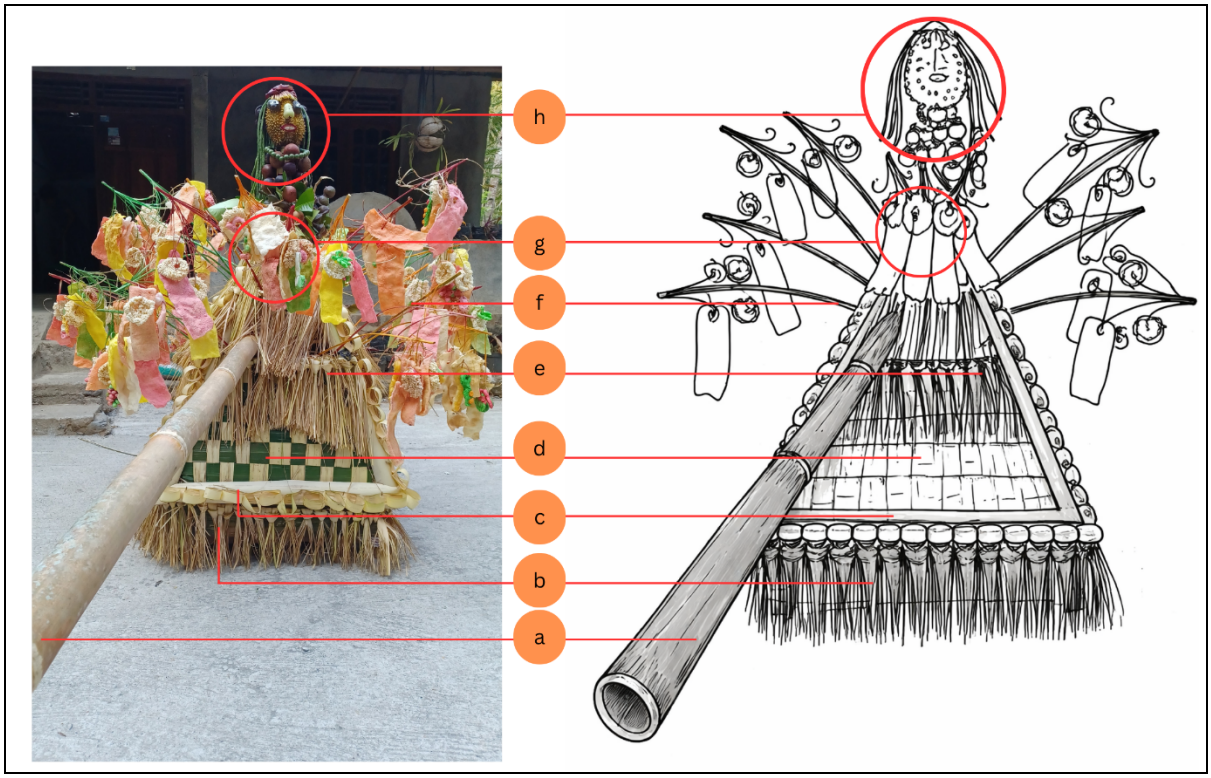

Figure 5. Structure of *Jolen*. (a) bamboo to lift the *Jolen*; (b) thinly sliced bamboo as the base of the *Jolen*; (c) banana leaf sheath to cover the frame of the Jolen; (d) *bleketepe* made of old *aren* leaves; (e) ornaments made of *Janur* (young *aren* leaves); (f) *Sunduk* made of bamboo cut into thin cylinders to put *Ledre, Binggelan*, and *Rengginan*; (g) *Ledre, Binggelan,* and *Rengginan*; (h) plant-derived products such as fruits and flowers in Somongari Village.

The exterior of the *Jolen* is decorated with *bleketepe* made from old *aren* leaves, banana leaf sheath, and *aren* ornaments. *Sunduk* made from bamboo is attached to the exterior to hang traditional foods such as *Ledre, Binggelan*, and *Rengginan*. *Ledre* and *Rengginan* are generally prepared about one week before the ritual, whereas *Binggelan* is prepared one or two days beforehand and fried on the morning of the procession. The upper section of the Jolen is decorated with *palawija lan woh-wohan*, traditional agricultural crops and fruits, such as durian **duren** (*Durio zibethinus* L.), **manggis** (*Garcinia mangostana* L.), **jengkol** (*Archidendron pauciflorum* (Benth.) I.C.Nielsen), and **kokosan** (*Epicharis parasitica* (Osbeck) Mabb.) produced in Somongari Village (Figure 5). These fruits and agricultural products are arranged to resemble human faces.

The inner section of the Jolen contains ritual foods, including three *tumpeng*, cone-shaped rice offerings, three *ayam panggang* or grilled chickens, three *gemblong*, traditional snacks made from glutinous rice, three banana hand, and three packages of vegetables and side dishes. The foods are prepared one day before the ritual and arranged early in the morning prior to the commencement of the procession. Following the procession, the food packages are distributed to the *Jolen* bearers and participants involved in the *kepungan* communal prayer activity (Figure 6). During the same period, the village caretaker (*juru kunci*) performs prayers and places *ubarampe* at the graves of the *pepundhen*.

At approximately 7:00 AM, the *Kirab Jolen* procession begins with the beating of the *bendhe*, a traditional pentatonic musical instrument commonly associated with *incling* dance performances. Although the *bendhe* originally belonged to a resident of Somongari Village, it is currently kept in the neighboring village of Jatirejo. It must be borrowed in accordance with ancestral agreements before major rituals are conducted. The peak of the procession is centered around the grave of Mbah Kedono Kedini.

The *Kirab Jolen* procession begins at the grave of Mbah Kedono Kedini, proceeds eastward through the village, and returns westward to the village boundary before ending at the same location. Dozens of *Jolens* are paraded for approximately 6.5 km through village streets. During the procession, villagers compete to obtain some of the exterior *ubarampe* through a practice called *ngalap berkah*, believed to bring blessings and prosperity from God and the ancestors. In contrast, the *ubarampe* placed inside the *Jolen* are reserved for the *kepungan* activity and the Jolen bearers (Figure 7).

Figure 6. Types of *ubarampe* in *Jolen.* (a) the outside of the *Jolen* seen from the back; (b) the inside of the *Jolen* containing food items such as (1) banana hand, (2) *ayam panggang*, (3) *tumpeng* rice, (4) *gemblong*, (5) vegetables, and side dishes, crackers including *ledre, binggelan,* and *rengginan*.

Figure 7. Activities ritual of the *Kirab Jolen.* (a) the initial line of the procession; (b) Dewi Sri was depicted as number 1 as a symbol of rice fertility and agricultural prosperity, while Raden Sadono was depicted as number 2 as a representation of the male or masculine aspect; (c) pak Lurah and bu Lurah (village leaders); (d) *Jolen* being paraded on the village road; (e) *ledre*, *binggelan*, and *rengginan* taken from *Jolen* during the procession; and (f) *incling* art, a traditional dance performance.

Utilization of Plants and Animals in Jolen Preparation

The *Jolenan* Somongari ritual incorporates a wide variety of plant- and animal-based materials as *ubarampe*. This study documented 22 species from 15 families used in ritual offerings. Biological materials are used either directly or processed into traditional foods prepared specifically for the *Jolen* ritual. Eleven main categories of *ubarampe* were identified, including *Rangka Jolen, Sunduk, Ledre, Binggelan, Rengginan, Palawija lan woh-wohan, ayam panggang* or *pitik garang, sekul tumpeng, gemblong, jangan sak lawuhe,* and *gedhang*. Detailed information on the types of *ubarampe* or offerings, plant and animal species, and the plant parts used is presented in Table 1.

Table 1. Types of ubarampe, plants, animals, and parts used in making *Jolen.*

No	Type of *ubarampe*	Explanation	Local Name	Species	Genus	Family	Clade/ Class*	Parts used
1	*Rangka Jolen*	The structure is made from bamboo, banana leaf sheaths, and banana stems, forming a rectangular pyramid covered with palm leaves.	**pring jawa** (Javanese bamboo)	*Gigantochloa atter* (Hassk.) Kurz ex Munro	*Gigantochloa*	*Poaceae*	*Monocots*	Stem
			gedhang (banana)	*Musa* sp.	*Musa*	*Musaceae*	*Monocots*	Stem and leaf sheaths
			aren (palm)	*Arenga pinnata* (Wurmb) Merr.	*Arenga*	*Arecaceae*	*Monocots*	Leaves (young and old)
2	*Sunduk*	Bamboo is fashioned into an elongated cylinder and coloured to hang food *ubarampe*, such as *ledre*, *binggelan*, and *rengginan*.	**pring jawa** (Javanese bamboo)	*Gigantochloa atter* (Hassk.) Kurz	*Gigantochloa*	*Poaceae*	*Monocots*	Stem
3	*Ledre*	The cassava-starch-based food is seasoned with salt and garlic, flattened to approximately 10x30 cm, and then fried until crispy. It resembles a cracker produced exclusively during the *Jolenan* festival.	**tela** (cassava)	*Manihot esculenta* Crantz.	*Manihot*	*Euphorbiaceae*	*Eudicots*	Tuber
			bawang (garlic)	*Allium sativum* L.	*Allium*	*Amaryllidaceae*	*Monocots*	Bulbs
4	*Binggelan*	The food is made with cassava starch, seasoned with salt and garlic, and shaped into fruit-like shapes before being fried.	**tela** (cassava)	*Manihot esculenta* Crantz	*Manihot*	*Euphorbiaceae*	*Eudicots*	Tuber
			bawang (garlic)	*Allium sativum* L.	*Allium*	*Amaryllidaceae*	*Monocots*	Bulbs
5	*Rengginan*	The food is prepared with sticky rice seasoned with salt and garlic, which is then shaped into a circle and fried.	**ketan** (sticky rice)	*Oryza sativa* var. glutinosa	*Oryza*	*Poaceae*	*Monocots*	Seed
			bawang (garlic)	*Allium sativum* L.	*Allium*	*Amaryllidaceae*	*Monocots*	Bulbs
6	*Palawija lan who-wohan*	Various types of vegetables and fruits are produced in Somongari village. They are used to create carved human faces, with some resembling men and others resembling women.	**duren** (durian)	*Durio zibethinus* L.	*Durio*	*Malvaceae*	*Eudicots*	Fruit
			manggis (mangosteen)	*Garcinia mangostana* L.	*Garcinia*	*Clusiaceae*	*Eudicots*	Fruit
			jengkol	*Archidendron pauciflorum* (Benth.) I.C.Nielsen	*Archidendron*	*Fabaceae*	*Eudicots*	Fruit
			kokosan	*Epicharis parasitica* (Osbeck) Mabb.	*Epicharis*	*Meliaceae*	*Eudicots*	Fruit
			kacang lanjaran (cowpea)	*Vigna unguiculata* (L.) Walp.	*Vigna*	*Fabaceae*	*Eudicots*	Fruit

			klapa (coconut)	*Cocos nucifera* L.	*Cocos*	*Arecaceae*	*Monocots*	Fruit
			jambu air (water guava)	*Syzygium aqueum* (Burm.f.) Alston	*Syzygium*	*Myrtaceae*	*Eudicots*	Fruit
			gedhang (banana)	*Musa* sp.	*Musa*	*Musaceae*	*Monocots*	Flower
7	*Ayam Panggang* or *Pitik Garang*	The *kampung* chicken is briefly marinated in ginger, turmeric, coriander, pepper, and salt to tenderize it, then grilled over charcoal. The seasoning for the grilled chicken varies from cook to cook.	**ayam** or **pitik** (chicken)	*Gallus gallus*	*Gallus*	*Phasianidae*	*Aves*	The whole body
			bawang (garlic)	*Allium sativum* L.	*Allium*	*Amaryllidaceae*	*Monocots*	Bulbs
			jahe (ginger)	*Zingiber officinale* Roscoe	*Zingiber*	*Zingiberaceae*	*Monocots*	Rhizome
			kunyit (turmeric)	*Curcuma longa* L.	*Curcuma*	*Zingiberaceae*	*Monocots*	Rhizome
			ketumbar (coriander)	*Coriandrum sativum* L.	*Coriandrum*	*Apiaceae*	*Eudicots*	Seed
			merica (pepper)	*Piper nigrum* L.	*Piper*	*Piperaceae*	*Magnoliids*	Seed
8	*Sekul Tumpeng*	The rice has been cooked and molded into a conical shape.	**pari (beras)** (rice)	*Oryza sativa* L.	*Oryza*	*Poaceae*	*Monocots*	Seed
9	*Gemblong*	The sticky rice was cooked with garlic and grated coconut. At this event, *Gemblong* was formed into a circle.	**ketan** (sticky rice)	*Oryza sativa* var. glutinosa	*Oryza*	*Poaceae*	*Monocots*	Seed
			bawang (garlic)	*Allium sativum* L.	*Allium*	*Amaryllidaceae*	*Monocots*	Bulbs
			klapa (coconut)	*Cocos nucifera* L.	*Cocos*	*Arecaceae*	*Monocots*	Fruit
10	*Jangan sak lawuhe* (vegetable and side dishes)	Typical meals include stir-fried cowpea vegetables, soybean tempeh, and cooked noodles seasoned with salt, onion, garlic, and chilli.	**kacang lanjaran** (cowpea)	*Vigna unguiculata* (L.) Walp.	*Vigna*	*Fabaceae*	*Eudicots*	Fruit
			dhele (soybean)	*Glycine max* (L.) Merr.	*Glycine*	*Fabaceae*	*Eudicots*	Fruit
			gandum (wheat)	*Triticum aestivum* L.	*Triticum*	*Poaceae*	*Monocots*	Seed (flour)
			brambang (onion)	*Allium cepa* L.	*Allium*	*Amaryllidaceae*	*Monocots*	Bulbs
			bawang (garlic)	*Allium sativum* L.	*Allium*	*Amaryllidaceae*	*Monocots*	Bulbs
			lombok (chili)	*Capsicum annuum* L.	*Capsicum*	*Solanaceae*	*Eudicots*	Fruit
11	*Gedhang* (Banana)	Bananas are served whole, with one *lirang* or banana hand per serving. However, the type of banana used for the *ubarampe* in *Jolen* was not specified.	**gedhang** (banana)	*Musa* sp.	*Musa*	*Musaceae*	*Monocots*	Fruit

Plants constituted the dominant biological resources used in the ritual. Species from the families Poaceae, Fabaceae, and Amaryllidaceae were among the most frequently represented taxa. Plant parts utilized in the ritual included stems, leaves, fruits, flowers, seeds, bulbs, rhizomes, and tubers. **Pring** (*Gigantochloa atter*) was mainly used to construct the *Jolen* frame and *Sunduk*, whereas **aren** (*Arenga pinnata*) leaves were woven into *bleketepe* decorations. Agricultural products and fruits such as **duren** (*Durio zibethinus*), **manggis** (*Garcinia mangostana*), **klapa** (*Cocos nucifera*), and **gedhang** (*Musa* sp.) were arranged as symbolic decorations on the exterior of the Jolen.

Several traditional foods used in the ritual were prepared from locally available biological resources. *Ledre* and *binggelan* were produced from **tela** (*Manihot esculenta*) and **bawang** (*Allium sativum*), whereas *rengginan* and *gemblon*g were prepared from **beras ketan** (*Oryza sativa* var. *glutinosa*). **Ayam** (*Gallus gallus*) *panggang* was seasoned with **jahe** (*Zingiber officinale*), **kunyit** (*Curcuma longa*), **ketumbar** (*Coriandrum sativum*), and **mrica** (*Piper nigrum*). Other ingredients used in side dishes included **dhele** (*Glycine max*), **gandum** (*Triticum aestivum*), **brambang** (*Allium cepa*), and **lombok** (*Capsicum annuum*).

Discussion

Jolenan Somongari represents a form of indigenous knowledge that contains important cultural and spiritual values preserved through ritual practices. Spirituality is closely associated with human identity and cultural expression (Ryff, 2021). Rituals, ceremonies, and traditional celebrations are manifestations of spirituality that strengthen relationships between humans, society, and nature (Pinto and Vilaça, 2023). In Somongari Village, *Jolenan* is not merely a ceremonial performance but also a symbolic representation of gratitude, social identity, ancestral remembrance, and ecological relationships embedded within Javanese cosmology.

According to informants, *Jolenan* Somongari symbolizes gratitude to God and the ancestors who transformed previously forested land into a productive settlement. The cultivation of crops such as durian and mangosteen enabled the local community to survive and prosper. Informants interpreted the word "Jolen" in the phrase *aja kelalen* as meaning "do not forget," emphasizing the importance of remembering ancestral services, maintaining social solidarity, and strengthening devotion to God. Although Islamic practices currently dominate ritual prayers, elements of older Javanese spirituality remain integrated into the ritual system, illustrating cultural acculturation within the community.

The use of 22 species belonging to 15 families in the *Jolenan* ritual demonstrates the close relationship between biological resources and cultural traditions in Somongari Village. Plants and animals are not used solely for basic needs but also serve as symbolic and spiritual elements in ritual practices (Adinugraha, 2024). Similar findings have been reported in ethnobiological studies, showing that indigenous rituals help maintain biocultural diversity by preserving culturally important species and transmitting ecological knowledge across generations (Adam *et al.* 2019; Adinugraha *et al.* 2024). Ritual practices, therefore, function not only as cultural expressions but also as mechanisms for sustaining relationships between humans and nature.

According to local belief, the Jolen symbolizes a mountain that reflects the topography of Somongari Village in the Menoreh Hills. One informant explained, *"Jagad tanpa anane paku gunung mesti ora bakal kuat,"* meaning that the Earth without "mountain nails" would not remain stable. In Javanese spirituality, mountains symbolize protection, balance, and environmental stability. Such symbolic interpretations demonstrate how ecological understanding is embedded within cosmological narratives and ritual traditions. This perspective is consistent with ethnobiological concepts of ritual ecology, in which local communities integrate environmental knowledge into spiritual systems and cultural symbolism (Sabasti *et al.* 2024; Shopo *et al.* 2022).

Informants also described the Jolen as representing a house or living space inhabited by humans, plants, animals, and spiritual beings. The food offerings placed inside the Jolen symbolize sustenance and welfare for all living beings associated with the mountain ecosystem. This symbolic interpretation reflects local ecological perspectives emphasizing reciprocity and balance between humans and nature (Trimanto *et al.* 2025). In many indigenous communities, ritual offerings are considered important expressions of respect toward natural and spiritual entities associated with the surrounding environment (Adinugraha *et al.* 2024; Arce and Cerdas, 2019; Sujarwo *et al.* 2020).

The *sunduk* attached to the outer structure of the *Jolen* also contains symbolic meanings associated with biodiversity. Informants explained that *sunduk* symbolizes tree branches growing on mountains, whereas *ledre* represents leaves,

binggelan represents fruits, and *rengginan* represents flowers. Through these symbolic representations, biological materials are transformed into cultural metaphors reflecting ecological relationships and local cosmology. Such findings support ethnobiological perspectives emphasizing that biodiversity possesses not only economic and ecological value but also symbolic and spiritual significance within indigenous societies.

The *Jolenan* tradition also strengthens unity and cooperation among villagers. The preparation of *Jolen* requires cooperation among households and community members, reinforcing solidarity, kinship, and mutual respect. The ritual also serves as a cultural gathering for relatives who have migrated and return to Somongari Village to participate in the celebration. However, this study found that not all community members fully understand the symbolic meanings of the *ubarampe* because ritual knowledge is primarily transmitted orally across generations. This condition may contribute to the gradual erosion of indigenous knowledge amid modernization and social change. Given this challenge, there is a need for effective strategies to document and transmit indigenous knowledge in more accessible and sustainable forms.

Educational media may play an important role in preserving and transmitting indigenous knowledge to younger generations. Educational videos have been recognized as effective tools for delivering cultural and environmental learning materials (Baron, 2023; Moussiades *et al.* 2019). Effective educational videos generally combine visual and verbal information, maintain a structured narrative, and enhance audience engagement (Buchner, 2018). In this study, an educational video documenting the preparation, procession, and symbolic meanings of *Jolenan* was developed to support the preservation and dissemination of indigenous knowledge. Such digital documentation may help safeguard intangible cultural heritage and increase public awareness of the relationship between biodiversity and local traditions. Supplementary Video S1 documenting the preparation and procession of *Jolenan* Somongari is available online through YouTube: https://youtu.be/Z2LOXX89tNo.

The findings of this study indicate that *Jolenan* Somongari represents a form of biocultural heritage in which ritual practices serve to preserve cultural identity, ecological knowledge, and relationships with biodiversity. The ritual demonstrates that local communities maintain sophisticated systems of symbolic ecology integrating plants, animals, spirituality, social values, and environmental understanding. Consequently, preserving indigenous rituals such as *Jolenan* may also contribute indirectly to biodiversity conservation and the continuity of local ecological knowledge systems.

This study focused primarily on the ubarampe used in the Jolen structure. It did not comprehensively document all ritual components associated with the broader *Jolenan* tradition, including post-procession activities, offerings placed at ancestral graves, and additional ritual practices conducted outside the main procession. The spiritual interpretations presented in this study were based on information from key informants. They may differ among community members, as Javanese spirituality is predominantly transmitted orally rather than in written form. Therefore, the meanings associated with Jolen and its *ubarampe* cannot be generalized to all individuals within the community.

Additionally, this study did not explore in detail the preparation processes and indigenous culinary knowledge associated with traditional ritual foods such as Ledre, Binggelan, Rengginan, and Ayam Panggang. Traditional food preparation techniques may represent important forms of ethnobiological knowledge related to biodiversity utilization, local food systems, and cultural identity. Future studies should therefore examine broader aspects of *Jolenan* Somongari, including ritual food preparation, knowledge transmission processes, gender roles in ritual activities, and changes in indigenous practices under modernization pressures.

Jolenan Somongari also has considerable potential for integration into educational contexts such as anthropology, history, environmental education, and biology instruction. Indigenous knowledge approaches may enrich educational perspectives by integrating biodiversity values into cultural learning processes. Such approaches may strengthen younger generations' awareness of biodiversity conservation, traditional ecological knowledge, and the importance of maintaining harmonious relationships between humans and nature.

Conclusion

Jolenan Somongari represents an important indigenous ritual tradition that integrates biodiversity use, spirituality, and local ecological knowledge within the Javanese community of Somongari Village. The ritual incorporates 22 species from 15 families, including plants and animals used as *ubarampe* in the construction of Jolen and in the preparation of ritual foods. These biological resources are not utilized solely for subsistence purposes but also possess symbolic meanings related to gratitude, protection, social harmony, and cosmological balance.

The findings demonstrate that *Jolenan* functions as a form of biocultural heritage, in which ritual practices help maintain relationships among humans, ancestors, and nature. Symbolic interpretations of mountains, food offerings, and agricultural products reflect a sophisticated system of ritual ecology embedded within local cosmology and indigenous knowledge systems. The ritual also strengthens unity and facilitates the transmission of cultural and ecological knowledge between generations within the community.

This study highlights the importance of indigenous ritual practices in sustaining biocultural diversity and preserving culturally significant species and knowledge systems. Therefore, safeguarding traditions such as *Jolenan* Somongari is important not only for cultural preservation but also for supporting biodiversity conservation and the continuity of local ecological knowledge amid modernization and social change.

Declarations

List of abbreviations: -

Ethics approval and consent to participate: This study followed ethical principles for research involving indigenous knowledge and local communities. Ethical clearance for this research was granted by the Research Ethics Committee of the Institute for Research and Community Service, Universitas Kristen Indonesia (Christian University of Indonesia), under Ethical Clearance No. 427/UKI.LPPM/PPM.00.02/2026. Prior informed consent was obtained from all informants before interviews, observations, and documentation were conducted. The research respected local cultural values, community permissions, and indigenous knowledge practices throughout the study.

Consent for publication: All participants agreed to the publication of anonymized research data, photographs, and documentation related to the *Jolenan* Somongari tradition.

Availability of data and materials: The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests.

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Author contributions: F.A. conceived and designed the study, conducted fieldwork, collected ethnobiological data, analyzed and interpreted the data, prepared the figures and tables, identified the biological specimens, and wrote the manuscript. R.S. contributed to data interpretation, discussion development, manuscript revision, and supervision of the research process. D.A.D. assisted in fieldwork, facilitated communication with the local community, contributed to indigenous knowledge documentation, and supported data collection during the *Jolenan* Somongari ritual. All authors read and approved the final manuscript.

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