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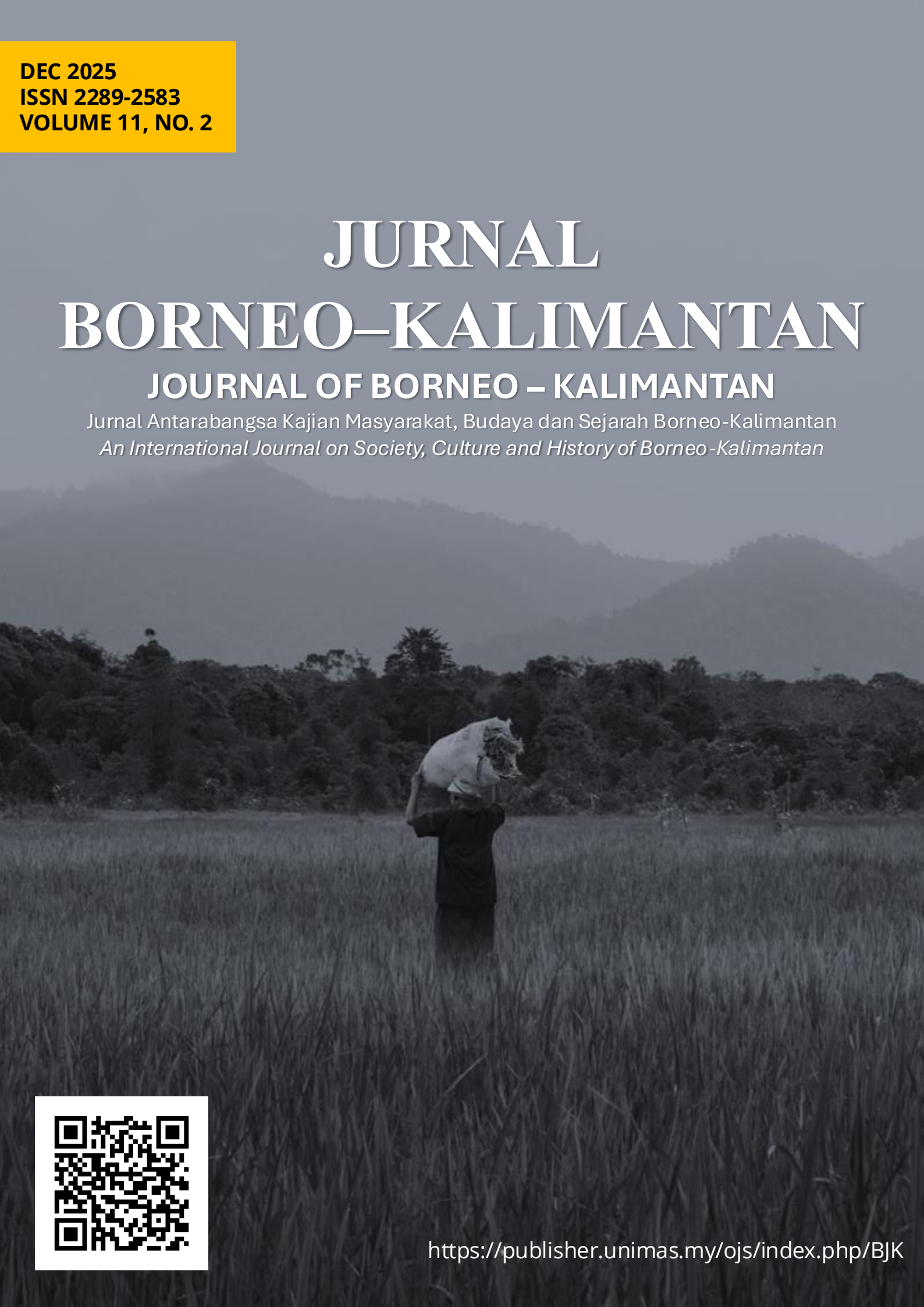

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Chief Editor's Desk

Welcome to another issue of Journal of Borneo-Kalimantan (JBK).

I am pleased to introduce you to 10 articles coming from the disciplines of anthropology, international studies, linguistic, development and health science. The diversity of the articles published reflects the breadth of JBK and its commitment to extend the boundaries of knowledge relating to Borneo Studies.

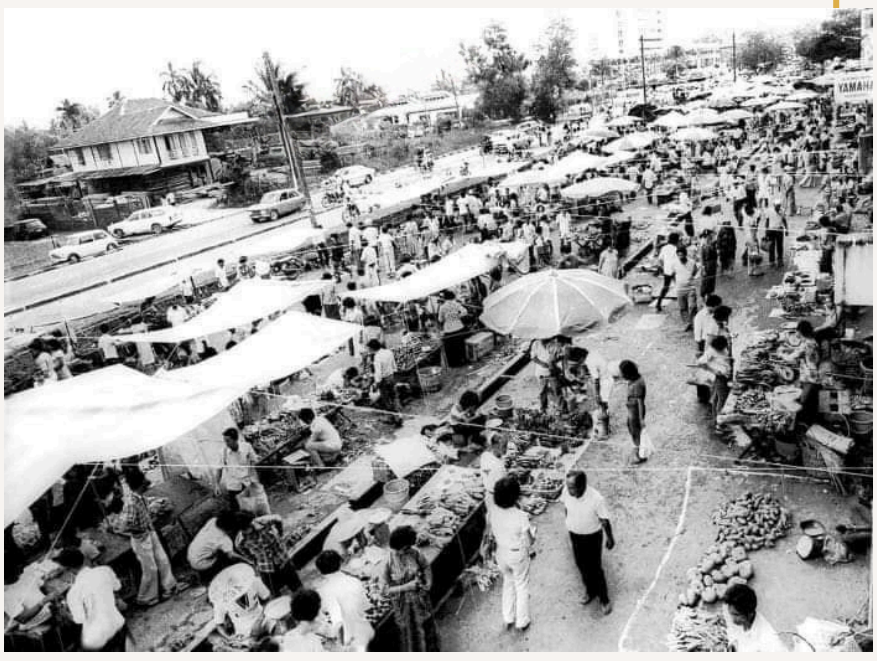
There are two articles pertaining to the Penan communities in Sarawak. Benard Upieh highlights the resilience of the community in navigating and adapting with the transition from nomadic to settled life. Jayl Langub presents an ethnographic account of rivers as integral part in the Penan identity and livelihood and in connecting the kins-relation across river systems. The remaking of cultural identity remains an important framing in describing the process of cultural reconstruction. Calvin Jemarang examines the construction of Punan identity through the triangulation of multiple data sources: ethnographic, genealogy and archive, to reveal how identity construction differs from one context to another. Claudia Jiton et al observes the functional transformation in the Dayak martial arts, kuntau, from self-defence practice to artistic performance has led to the survival of kuntau as a living symbol of Iban's identity in the modern era. Norazuna Norahim contributes to the discussion of the transformation of the Dayak culture through the function of Iban language, from the use in a community context to the formal setting, which will increase the complexity of the language. An article by Nurul Huda Marwan et al adds another dimension in the cross-border interaction in Sarawak by utilising an international relations' perspective in examining the role played by Sarawak state as an agent of paradiplomacy in dealing with the challenges involving the movement and transaction at and across the border. The theme on indigenous health practice is explored in the three articles. Kho et al compiled the plants used by the Kenyah communities in Borneo for medicinal purpose pointed to the knowledge value of the communities. Bolhassan et al draws attention on the continuing use of traditional remedy in the midwifery practice in Sarawak, while Bo et al demonstrates the effective role of religion in promoting healthy lifestyle among its followers.

JBK is delighted to receive a collection of research notes from the Francke Foundations in Halle, Germany. The papers presented in the workshop, Out of Borneo: Provenance and Materiality of Objects from Borneo, discussed the objects and the history of collecting in reference to the Borneo objects housed in the Wunderkammer of the Francke Foundation. Readers will find the descriptions and the contexts informative especially in the current drive towards commodification of artefacts and the nationalisation of cultural identity among the nation-states in Borneo. The other contribution in the section is by Ganendra presenting an Academic Impact Magnified framework.

We thanked our contributors, reviewers, editors and readers for their incredible support to JBK in 2025. We wish you a Happy New Year 2026, and may the year brings more success to all around.

Happy reading !

Chief Editor
Editorial Team



Weekend Market in Satok Road, Kuching, circa 1970s.

Journal of Borneo – Kalimantan

Identiti Kaum Penan di Sarawak Berasaskan Modifikasi Modal Semula Jadi [*The Identity of the Penan Community in Sarawak Based on the Modification of Natural Capital*]

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ABSTRAK

Hubungan timbal balik yang terjalin secara semula jadi antara masyarakat Penan dan modal semula jadi berpaksikan kepada keperluan asas kehidupan harian yang saling melengkapi. Kecenderungan masyarakat Penan untuk memodifikasi modal semula jadi dilihat sebagai satu strategi yang diadaptasi untuk memenuhi tuntutan kelangsungan hidup.. Seiring dengan itu, proses modifikasi ini telah membentuk suatu identiti unik yang mencerminkan budaya dan cara hidup masyarakat Penan yang dinamik. Makalah ini bertujuan meneliti pembentukan identiti masyarakat Penan berasaskan modifikasi terhadap modal semula jadi. Kajian empirikal telah dilaksanakan melibatkan komuniti Penan di Batu Bungan, Kampung Long Lesuan, dan Kampung Long Ludin, yang terletak dalam daerah Baram dan Telang Usan, Sarawak. Data dikumpulkan melalui pendekatan kualitatif yang merangkumi temu bual mendalam dan pemerhatian turut serta di lapangan. Hasil kajian mengenal pasti kewujudan dua bentuk identiti utama dalam kalangan masyarakat Penan, iaitu (1) identiti tradisional dan (2) identiti beradaptasi. Kedua-dua bentuk identiti ini, secara kumulatif, membentuk susunan sosio-budaya masyarakat Penan kontemporari. Kajian ini mencadangkan agar pembentukan identiti tersebut dijadikan asas dalam wacana ilmiah bagi memperkukuh rujukan akademik yang berkaitan dengan komuniti peribumi. Pemeliharaan identiti masyarakat Penan dilihat sebagai aspek yang signifikan dalam usaha memperkukuh jati diri mereka, khususnya dalam konteks penyertaan yang lebih bermakna ke dalam masyarakat arus perdana.

Kata kunci: Kaum Penan; identiti; inovasi; modal semula jadi; Baram dan Telang Usan.

PENGENALAN

Menurut Langub (2023), masyarakat Penan merupakan salah satu kelompok masyarakat yang mendiami wilayah Sarawak. Davis (1990) turut menyatakan bahawa masyarakat Penan terdiri daripada kelompok-kelompok kecil yang menghuni kawasan pedalaman hutan Borneo. Dipercayai bahawa asal usul masyarakat

Penan adalah dari Sungai Kayan di Kalimantan, Borneo. Selanjutnya, mereka berhijrah ke Sarawak dan berpecah menjadi dua kelompok utama, yang dikenali sebagai Penan Timur dan Penan Barat (Hood Salleh, 2006; Bending, 2006; SUARAM, 2010).

Sejak dahulu, kehidupan masyarakat Penan bergantung erat pada sumber modal semula jadi sekaligus membolehkan mereka melakukan modifikasi terhadap modal semula jadi untuk keperluan harian. Istilah modifikasi modal semula jadi dalam konteks masyarakat Penan merujuk kepada proses penyesuaian, pengolahan dan memanfaatkan sumber alam yang dilakukan secara dinamik mengikut perubahan persekitaran, keperluan hidup, serta peralihan sosioekonomi. Modifikasi ini tidak hanya melibatkan penggunaan langsung hasil hutan, tetapi turut merangkumi bagaimana masyarakat Penan menstruktur semula pengetahuan ekologi, gaya hidup tradisional, dan amalan budaya untuk kekal relevan walaupun berlaku perubahan gaya hidup daripada nomadik kepada kehidupan menetap. Dengan kata lain, modifikasi modal semula jadi menggambarkan cara masyarakat Penan mengekalkan hubungan timbal balik dengan alam sambil menyesuaikan strategi kelangsungan hidup mereka dalam konteks moden. Hal ini disebabkan oleh ketersediaan segala keperluan harian mereka daripada sumber modal semula jadi tersebut (SUARAM, 2010).

Sumber modal semula jadi atau hutan telah dianggap sebagai khazanah yang bernilai dan membentuk jati diri masyarakat Penan sejak berabad-abad (Zawawi & Noorshah, 2012). Pada masa kini, masyarakat Penan telah mengadaptasi cara hidup yang serupa dengan kelompok masyarakat lain, dengan menetap di perkampungan serta mengamalkan aktiviti bercucuk tanam, menghasilkan kraf tangan, dan menjalankan aktiviti ekonomi (Zawawi & Noorshah, 2012; Liau, 2020).

Walau bagaimanapun, identiti masyarakat Penan yang berakar umbi pada modifikasi sumber alam tetap dipertahankan. Oleh yang demikian, peralihan gaya hidup mereka daripada nomad kepada menetap telah mewujudkan identiti baharu yang dimiliki selain daripada identiti tradisional. Hasil kajian menunjukkan bahawa masyarakat Penan memiliki dua (2) jenis identiti, iaitu (1) identiti tradisional dan (2) identiti adaptasi.

Walaupun masyarakat Penan kini mengalami perubahan ketara dalam corak kehidupan akibat peralihan daripada gaya hidup tradisional, iaitu nomad kepada kehidupan moden yang menetap, identiti mereka berteraskan modifikasi modal semula jadi masih kekal sebagai jati diri. Perubahan struktur kehidupan ini bukan sahaja mencerminkan proses adaptasi terhadap konteks sosioekonomi semasa, malah telah melahirkan satu bentuk identiti baharu yang wujud seiring dengan identiti tradisional. Justeru itu, dapatan kajian ini memperlihatkan bahawa identiti masyarakat Penan tidak bersifat tunggal atau statik, sebaliknya terbentuk melalui dua dimensi utama, iaitu (1) identiti tradisional yang berasaskan amalan dan nilai warisan, serta (2) identiti beradaptasi yang terhasil daripada proses penyesuaian terhadap perubahan persekitaran dan transisi kehidupan.

ISU

Identiti tradisional dan identiti beradaptasi kaum Penan wujud lantaran kehidupan mereka yang bergantung pada modal semula jadi dan pada masa yang sama mengadaptasi norma baru kehidupan menetap. Kaum Penan mempunyai identiti khusus iaitu, identiti tradisional mereka yang akrab dengan modal semula jadi di sekeliling mereka. Peralihan gaya hidup kaum Penan daripada nomadik kepada kehidupan menetap telah membentuk semula hubungan mereka dengan modal semula jadi, realiti ini menimbulkan persoalan penting berkaitan pembentukan dan transformasi identiti mereka. Isu ini signifikan untuk dikaji kerana modal semula jadi, khususnya hutan, bukan sekadar sumber ekonomi, tetapi merupakan asas pembentukan jati diri, nilai dan amalan sosial masyarakat Penan. Perubahan terhadap cara hidup dan persekitaran sosial ini menuntut satu kefahaman yang lebih mendalam tentang bagaimana identiti masyarakat Penan dikekalkan, diubahsuai dan dipadankan dalam konteks pembangunan semasa.

Sejak sekian lama, modal semula jadi berasaskan hutan menjadi identiti dan jati diri kaum Penan. Namun demikian, perubahan gaya hidup memerlukan mereka menyesuaikan diri dengan suasana kehidupan seharian. Oleh itu kaum Penan mulai mengadaptasi gaya hidup yang baharu. Dengan adanya gaya hidup baru, kebergantungan mereka pada modal semula jadi turut terkesan dari segi penggunaan dan akses mereka pada modal semula jadi.

Dalam konteks masyarakat Penan, identiti tradisional ini dapat diperhatikan melalui penghasilan peralatan dan kraf tangan seperti bakul, tikar dan sumpit yang dihasilkan sepenuhnya menggunakan bahan daripada modal semula jadi secara tradisional. Amalan ini merupakan kesinambungan antara pengetahuan tradisional dan bentuk identiti yang masih berakar pada kerangka kehidupan nomad walaupun mereka kini telah hidup menetap.

Identiti beradaptasi pula bermaksud kaum Penan melakukan inovasi dalam proses penghasilan kraf tangan, antaranya dengan mencampurkan bahan yang digunakan. Jika dahulu mereka menggunakan rotan seratus peratus untuk menyiapkan produk kraf tangan, kini mereka menggunakan tali plastik diperbuat daripada polivinil klorida (PVC) yang boleh dicampur dengan *ihat* (rotan) untuk tujuan anyaman. Penggunaan tali plastik PVC adalah bagi tujuan penjimatan *ihat* walaupun dari segi keasliannya telah hilang. Tambahan pula tali plastik tersebut terdapat dalam pelbagai warna dan corak yang lebih menarik jika dibandingkan dengan rotan yang hanya ada tiga warna sahaja, iaitu hitam, putih dan merah. Selain penggunaan tali plastik bagi tujuan menambah baik produk kraf tangan, peserta kajian turut menggunakan cat atau *spray* untuk mewarnakan bakul atau tikar yang telah siap.

Selain modifikasi terhadap bahan yang digunakan untuk hasilkan kraf tangan, kaum Penan turut memodifikasi cara mereka mengakses modal semula jadi pada masa kini. Oleh kerana kawasan hutan lazimnya jauh dari kawasan penempatan, kini kaum Penan menaiki motosikal, kereta dan perahu untuk mengakses modal semula jadi.

Walau bagaimanapun, kajian terdahulu cenderung membincangkan hubungan masyarakat Penan dengan modal semula jadi secara umum tanpa pengkategorian identiti yang jelas. Oleh itu, makalah ini bertujuan untuk menjelaskan secara konseptual dua bentuk identiti tersebut, sekali gus menyumbang kepada perbincangan akademik mengenai transformasi identiti komuniti peribumi di Borneo dalam konteks perubahan gaya hidup, pembangunan dan ketahanan budaya khususnya bagi masyarakat Penan.

METODOLOGI KAJIAN

Penyelidik menggunakan reka bentuk kajian etnografi dalam melaksanakan kajian ini. Reka bentuk kajian etnografi membantu penyelidik untuk mendalami nilai dan cara hidup kaum Penan, khususnya berkaitan identiti yang dimiliki. Penyelidik telah menggunakan tiga kaedah pengumpulan data, iaitu i) temu bual mendalam, ii) pemerhatian dan iii) nota lapangan. Temu bual mendalam merupakan interaksi bersemuka antara penyelidik dan informan kajian dalam beberapa waktu yang sesuai mengikut keperluan dan kelapangan (Reeves et al., 2008). Manakala, pemerhatian merupakan proses di mana penyelidik berada dalam persekitaran subjek kajian bagi tujuan memerhati dan mencatat dalam jangka masa yang ditetapkan (Chua, 2012). Kaedah pengumpulan yang seterusnya, iaitu nota lapangan merupakan catatan harian bagi melengkapkan data-data yang sedia ada. Nota lapangan dicatat dalam bentuk tulisan di buku nota secara ringkas, gambar, video dan audio.

Sampel kajian ini adalah kaum Penan yang menetap di tiga buah kampung yang terletak di daerah Baram dan Telang Usan, iaitu Kampung Batu Bungan, Long Lesuan dan Long Ludin. Penyelidik memilih tiga kampung tersebut kerana penduduknya mempunyai ciri-ciri yang diperlukan bagi penyelidikan, mereka masih mengakses modal semula jadi dan tetap menjadikannya sebagai identiti mereka.

Penyelidik menggunakan pensampelan bertujuan dalam melaksanakan kajian. Pensampelan bertujuan bermaksud penyelidik menetapkan ciri-ciri khusus untuk memilih informan kajian di lapangan. Pensampelan bertujuan digunakan kerana membantu penyelidik mencapai objektif kajian berasaskan ciri-ciri informan yang dipilih. Penyelidik telah menetapkan tiga ciri khusus untuk memilih informan iaitu, pengalaman hidup, pekerjaan dan kekerapan akses modal semula jadi.

Dalam penyelidikan ini, seramai sembilan orang informan mewakili kampung Batu Bungan, lapan orang informan mewakili kampung Long Lesuan dan enam orang informan dipilih mewakili kampung Long Ludin telah terlibat. Informan-informan tersebut merupakan sampel yang telah terlibat dalam kaedah temu bual mendalam, pemerhatian dan nota lapangan. Jumlah informan tersebut telah ditetapkan sehingga mendapat ketepuan data. Kajian telah dilaksanakan selama empat bulan, di mana penyelidik tinggal bersama informan kajian sehingga data yang diperolehi mencapai objektif kajian.

Data yang diperoleh dianalisis dengan perisian komputer QSR Nvivo melalui pendekatan analisis tema (*thematic analysis*). Data daripada kaedah temu bual mendalam ditranskripsikan terlebih dahulu secara verbatim, iaitu dengan menulis semula rakaman audio ayat demi ayat dalam bentuk teks tanpa mengubah satu pun makna asal yang disampaikan oleh informan kajian. Proses transkripsi ini turut merangkumi data daripada pemerhatian (turut serta dan tidak turut serta) serta catatan nota lapangan, yang kemudiannya disatukan dalam pangkalan data yang sama untuk tujuan analisis yang sistematik.

Proses analisis data dilakukan secara berperingkat. Pada peringkat pertama, penyelidik melaksanakan pengekodan terbuka (*open coding*) bagi mengenal pasti unit-unit makna yang berulang berkaitan identiti (tradisional dan beradaptasi), cara dan tujuan penggunaan modal semula jadi dan cara akses modal semula jadi. Peringkat kedua, kod yang telah terkumpul menggunakan pendekatan kod terbuka telah disusun dan digabungkan melalui pengekodan paksi (*axial coding*) bagi membentuk tema-tema yang lebih luas berdasarkan persamaan makna yang telah diperolehi.

Berdasarkan proses tersebut, kategori identiti tradisional dan identiti beradaptasi terbentuk secara induktif melalui lapangan. Identiti tradisional merangkumi tema-tema yang berkaitan dengan amalan tradisional sama ada dari segi penggunaan modal semula jadi serta pengekalan nilai tradisi. Manakala, identiti beradaptasi merujuk kepada tema-tema yang menunjukkan penerimaan inovasi, penggunaan bahan dan teknologi moden, serta penyesuaian strategi ekonomi dan sosial dalam konteks perubahan persekitaran kehidupan kaum Penan.

Keseluruhan proses analisis ini dijalankan secara interaktif, iaitu dengan pengulangan antara data mentah, kod dan tema bagi memastikan ketekalan tafsiran serta kesepadanan dapatan dengan objektif kajian. Penggunaan QSR Nvivo membantu penyelidik menguruskan data kualitatif yang besar secara sistematik, meningkatkan ketelusan data dan menyokong kebolehpercayaan dapatan kajian.

HASIL KAJIAN

Bahagian ini adalah berkenaan hasil kajian yang diperoleh dari lapangan. Hasil kajian mendapati kaum Penan memiliki dua identiti khusus berasaskan modifikasi modal semula jadi. Identiti khusus tersebut ialah, i) identiti tradisional dan ii) identiti beradaptasi. Kedua-dua identiti khusus tersebut diperincikan lagi berdasarkan hasil kajian yang telah diperoleh.

1. Identiti tradisional

1.1 Pencipta kraf tangan

Kaum Penan merupakan pereka kraf tangan berasaskan modal semula jadi yang kreatif. Mereka menghasilkan kraf tangan untuk kegunaan harian dan untuk dijual melalui modal semula jadi yang wujud di sekitar mereka. Pereka kraf tangan yang dimaksudkan dalam kajian ini ialah kaum Penan yang masih menghasilkan produk kraf tangan. Produk kraf tangan merujuk kepada produk yang dihasilkan oleh peserta kajian bagi tujuan kegunaan harian, perhiasan dan jualan.

Kraf tangan tradisional kaum Penan diperbuat sepenuhnya daripada rotan. Hasil kraf tangan yang diperbuat daripada rotan ini menunjukkan keaslian buatan dan reka bentuk kraf tangan mereka. Antara rotan yang digunakan oleh kaum Penan bagi tujuan penghasilan kraf tangan mereka adalah seperti dalam Gambar 1 dan Gambar 2.

Gambar 1: Pokok rotan

Gambar 2: Rotan yang sudah dipotong

Hasil kajian mendapati peserta kajian menghasilkan kraf tangan sebagai rutin harian dan ini menjadikan penghasilan kraf tangan sebagai identiti mereka. Di samping itu juga, perkara tersebut merupakan satu usaha untuk mengekalkan identiti mereka. Realiti ini tidak jauh berbeza dengan pandangan yang pernah diketengahkan oleh Amir Hasan Dawi (2010) yang mendapati bahawa setiap pihak atau kumpulan komuniti berusaha mengekalkan identiti mereka sama ada secara tersurat atau tersirat.

Kajian mendapati bahawa kaum Penan menonjolkan identiti mereka berasaskan modal semula jadi secara langsung melalui penghasilan kraf tangan. Kenyataan wakil informan kajian menjelaskan identiti mereka sebagai pencipta kraf tangan adalah seperti berikut:

> *"Kalau pasal hal tersebut, (menghasilkan kraf tangan) saya boleh katakan di sini merupakan kilangnya dan di sini kilang yang terbaik. Mereka mahir. (mereka yang dirujuk oleh informan kajian adalah golongan wanita)."*
>
> *(Informan LLE 2)*

Perbualan temu bual mendalam bersama informan LLE 2 menjelaskan bahawa kaum Penan, khasnya golongan wanita masih menghasilkan kraf tangan yang terbaik dan berkualiti. Hal ini bermaksud mereka telah melakukan aktiviti penghasilan kraf tangan sejak sekian lama, oleh itu mereka menjadi mahir. Pada masa yang sama, secara langsung penghasilan kraf tangan tersebut telah menjadi salah satu identiti tradisional mereka.

1.1. (a) Bakul

Hasil kajian yang dijalankan menunjukkan identiti tradisional ditonjolkan melalui penggunaan modal semula jadi sebagai bahan penghasilan kraf tangan. Antara kraf tangan yang dihasilkan oleh kaum Penan ialah bakul rotan pelbagai saiz dan reka bentuk. Bakul-bakul rotan yang dihasilkan adalah untuk kegunaan harian dan juga untuk dijual.

Walaupun tujuan penghasilan kraf tangan tersebut berbeza pada masa kini, kaum Penan masih menerapkan elemen tradisional dari segi bahan yang digunakan untuk menghasilkan bakul-bakul tersebut. Penghasilan bakul rotan yang unik membolehkan kaum Penan terutamanya informan kajian dari kampung Batu Bungan menjual hasil kraf tangan mereka kepada pelancong. Hal tersebut merupakan satu kelebihan ekonomi bagi mereka.

Antara reka bentuk bakul yang dihasilkan oleh kaum Penan adalah seperti dalam Gambar 3, Gambar 4 dan Gambar 5. Setiap satu bakul memiliki fungsi dan kelebihan yang tersendiri. Namun seratus peratus bahan kraf tangan tersebut adalah daripada rotan tanpa campuran tali plastik.

Gambar 3: *Gaweng* (Bakul rotan 1)

Bakul rotan di dalam Gambar 3 *(gaweng)* merupakan bakul yang digunakan oleh kaum Penan untuk kegunaan harian apabila masuk ke hutan atau ke ladang. *Gaweng* digunakan untuk membawa barangan keperluan seperti bekalan makanan, minuman, mancis, atau hasil hutan yang perlu dibawa pulang.

Gambar 4: *Serut* (Bakul rotan 2)

Bakul rotan di dalam Gambar 4 *(serut)* biasanya digunakan oleh kaum Penan untuk membawa barang-barang kering seperti beg duit, telefon, kunci dan boleh juga digunakan untuk masuk ke hutan. Fungsi serut hampir sama seperti *gaweng*, cuma reka bentuk yang berlainan menyebabkan penggunaan yang agak berbeza. Lazimnya *serut* tidak tahan lasak, oleh sebab itu hanya digunakan membawa barangan kering sahaja.

Gambar 5: *Kivah* (Bakul rotan 3)

Bakul rotan di dalam Gambar 5 *(kivah)* pula merupakan bakul yang paling besar dan kukuh dihasilkan oleh kaum Penan. *Kivah* diperbuat sepenuhnya daripada rotan. *Kivah* boleh membawa muatan yang berat seperti kayu api, seekor babi, rusa dan kijang. Jika kaum Penan masuk ke hutan untuk tempoh berminggu-minggu, *kivah* merupakan bakul yang digunakan untuk membawa bekalan dan barangan keperluan.

Kajian mendapati ketiga-tiga hasil kraf tangan, iaitu *gaweng, serut* dan *kivah* memaparkan sifat tradisional yang kuat. Semua bakul tersebut diperbuat sepenuhnya daripada modal semula jadi tanpa ada campuran bahan plastik PVC atau bahan tiruan. Realiti ini menunjukkan bahawa identiti tradisional kaum Penan masih ditonjolkan melalui penghasilan atau modifikasi modal semula jadi.

1.1. (b) Tikar rotan

Bagi tikar rotan biasa, terdapat pelbagai corak asas dan corak lain-lain yang diberi nama tertentu oleh peserta kajian. Setiap satu corak yang ada boleh ditiru atau dihafal oleh individu bagi membolehkan dianyam pada tikar yang baru dihasilkan. Antara corak yang asas selalu dianyam pada tikar rotan adalah *"betek pesun"*, *"betek kelunan"*, *"betek uheng"* dan *"betek maten juhit"* **(**Betek=corak**).** Setiap corak tersebut membawa kepada identiti tradisi kaum Penan kerana corak-corak tersebut diajar secara turun-temurun. Gambar 6 menunjukkan reka bentuk corak yang ada pada tikar rotan yang dihasilkan oleh kaum Penan.

Gambar 6: Tikar rotan

Sebagai kesimpulannya, identiti tradisional kaum Penan berkait rapat dengan modal semula jadi. Mereka memanfaatkan modal semula jadi untuk menghasilkan kraf yang menjadi keperluan harian mereka. Pada masa yang sama, kraf yang dihasilkan tersebut merupakan salah satu identiti tradisional mereka.

2. Identiti beradaptasi

Hasil kajian turut menunjukkan peserta kajian memiliki identiti beradaptasi melalui inovasi dalam penghasilan kraf tangan. Inovasi yang berlaku bukan sahaja tertumpu kepada perubahan jenis bahan yang digunakan, seperti campuran bahan PVC dan nilon, tetapi turut melibatkan transformasi dalam proses pengumpulan bahan daripada modal semula jadi.

Sebelum ini, kaum Penan hanya menggunakan parang atau kapak sahaja bagi tujuan mengambil rotan. Kini mereka telah memiliki gergaji rantai bagi tujuan menebang pokok-pokok yang menjadi tumpangan rotan. Ini membolehkan proses mengambil rotan lebih mudah dan lebih cepat jika berbanding dahulu. Semua perkara tersebut merupakan inovasi yang telah dilakukan oleh peserta kajian dalam kerja-kerja penghasilan produk modal semula jadi. Selain itu, kebanyakan aktiviti memasuki hutan kini dilakukan dengan menaiki kenderaan seperti motosikal, perahu atau kereta untuk ke destinasi yang dikehendaki. Mereka tidak lagi berjalan kaki untuk masuk ke hutan seperti dahulu.

Inovasi dalam penghasilan kraf tangan oleh kaum Penan didorong oleh beberapa faktor utama, termasuklah kekurangan bahan semula jadi, keperluan untuk meningkatkan produktiviti, serta tuntutan pasaran terhadap produk kraf tangan yang tahan lama dan bervariasi dari segi corak dan warna. Pada masa yang sama, inovasi ini juga berfungsi sebagai strategi ekonomi untuk menjana pendapatan yang lebih stabil dalam kehidupan dengan latar moden mereka.

Hasil kajian berkaitan identiti beradaptasi dalam inovasi untuk memodifikasi modal semula jadi ditunjukkan melalui penghasilan kraf tangan mereka yang dicampur bahan semula jadi dan bahan plastik pvc atau tiruan. Modifikasi pada bahan dipelbagaikan oleh kaum Penan dalam setiap kraf yang dihasilkan termasuklah bakul, tikar dan kraf berasaskan manik.

2.1. (a) Bakul

Kini kaum Penan menghasilkan bakul dengan menggunakan tali plastik pvc sebagai bahan sepenuhnya atau campuran. Disebabkan tali plastik bersifat lembut, kraf tangan berasaskan tali plastik pvc dicampur dengan rotan sebagai "tulang" (rangka) atau penahan agar lebih kukuh. Reka bentuk bakul yang dihasilkan adalah

seperti dalam Gambar 7, 8 dan 9. Inovasi yang menghasilkan bakul dan kraf menggunakan tali plastik mempunyai kelebihan dari segi pilihan warna. Pelbagai jenis warna tali plastik boleh didapati di pasaran. Jika dibandingkan dengan rotan, mereka hanya mempunyai dua pilihan warna, iaitu hitam dan putih. Oleh demikian, inovasi tersebut memberi kelebihan kepada kaum Penan dalam penghasilan kraf tangan mereka dan pada masa yang sama boleh bersaing di pasaran lebih jauh dan luas.

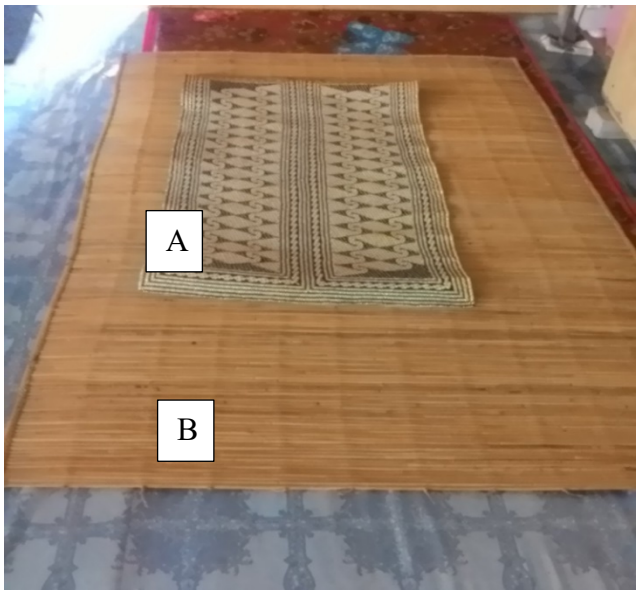
Gambar 7: Bakul tali PVC 1

Gambar 8: Bakul tali PVC 2

Gambar 9: Bakul tali PVC 3

2.1. (b) Tikar

Peserta kajian juga menghasilkan tikar jenis lain yang dipanggil "*lapit*". *Lapit* lebih mahal daripada tikar rotan biasa, walaupun *lapit* juga dihasilkan dengan menggunakan rotan. Bezanya ialah, belahan rotan yang digunakan agak besar kerana sebatang rotan hanya dibelah kepada dua bahagian untuk membuat *lapit*. Oleh demikian, jumlah rotan yang diperlukan juga lebih banyak. *Lapit* memerlukan tali nilon untuk mengikat semua belahan rotan bagi membolehkannya membentuk tikar yang cantik seperti dalam Gambar 10. Inovasi atau modifikasi yang dilakukan oleh peserta kajian dalam menghasilkan *lapit* ialah pada penggunaan tali nilon. Tali nilon lebih mudah diguna untuk mengikat belahan-belahan rotan tikar agar lebih kukuh dan kemas.



Gambar 10: A, Tikar rotan; B, *Lapit*

2.1. (c) Kraf tangan manik

Peserta kajian turut menghasilkan kraf tangan berasaskan manik. Lazimnya manik bukanlah berasal dari bahan mentah atau bahan semula jadi yang dihasilkan mereka, sebaliknya dibeli di pasaran. Kemudiannya, manik-manik tersebut digubah menjadi kraf tangan yang pelbagai seperti rantai, gelang, cendera mata, bakul bagi tujuan hantaran perkahwinan atau pertunangan dan perhiasan rumah.

Kajian mendapati bahawa penghasilan manik merupakan satu bentuk adaptasi oleh kaum Penan daripada kaum lain di sekeliling mereka. Mereka belajar menggubah manik menjadi kraf tangan dan menjualnya sebagai sumber pendapatan. Peserta kajian menjelaskan bahawa penghasilan kraf tangan manik merupakan kemahiran yang dipelajari oleh mereka. Berikut merupakan hasil temu bual mendalam bersama informan BB1 yang mewakili peserta lain:

> *Bikin manik atau menganyam (menggubah manik menjadi kraf tangan) ini saya belajar dari bangsa lain. Semua kami di sini pun sama, belajar dari orang lain dulu, baru ajar kawan-kawan. Lama-lama pandailah bikin ini manik. Walaupun bukan asal usulnya kerja tangan saya tapi disebabkan boleh jual, saya pun ikut bikin ini manik.*
>
> *(Informan BB1)*

Berdasarkan hasil temu bual mendalam bersama informan BB1, jelas bahawa penghasilan kraf berasaskan manik merupakan adaptasi dari luar lingkungan kelompok mereka. Realiti ini merupakan satu bentuk identiti adaptasi kaum Penan, di mana mereka turut menghasilkan kraf yang asalnya hanya dihasilkan oleh kaum lain di sekeliling mereka. Namun kaum Penan mampu mempelajari cara-cara hasilkan kraf tangan tersebut dan akhirnya dijadikan sumber pendapatan mereka. Antara contoh manik yang dihasilkan oleh kaum Penan adalah seperti dalam Gambar 11 dan 12.

Gambar 11: Kraf manik

Gambar 12: Kraf manik

2.1. (d) Sumpit

Sumpit merupakan salah satu daripada kraf tangan yang dihasilkan oleh peserta kajian turun-temurun. Hasil kajian mendapati sumpit antara kraf tangan yang menggambarkan identiti beradaptasi dalam memodifikasi modal semula jadi. Pada masa dahulu, peserta kajian hanya membuat sumpit bagi tujuan kegunaan sendiri dan menjadi salah satu senjata utama dan wajib dimiliki bagi tujuan kelangsungan hidup.

Proses pembuatan sumpit memerlukan pemilihan jenis kayu yang sesuai terlebih dahulu. Jenis kayu dipilih berdasarkan tujuan sumpit yang dibuat sama ada untuk dijual atau digunakan sendiri. Peserta kajian jarang menjual sumpit yang diperbuat daripada kayu berkualiti. Hal ini kerana, sumpit yang dijual hanyalah untuk hiasan dan cendera mata sahaja. Berikut merupakan hasil kajian bersama informan LLE yang mewakili peserta lain menerangkan pemilihan jenis kayu untuk dibuat sumpit:

> *"Kalau saya pilih kayu untuk buat sumpit ni macam Tanyit (Tapang), Nyagang, Pa dan Pokok Nangka itu yang paling bagus. Untuk guna berburu, boleh dan guna sendiri pun boleh. Kalau untuk jual asalkan kayu saja, boleh dibuat sumpit itu."*
>
> *(Informan LLE)*

Hasil temu bual mendalam bersama informan LLE menjelaskan bagaimana peserta kajian menentukan jenis kayu yang digunakan bagi tujuan penghasilan sumpit. Jenis kayu dipilih berdasarkan tujuan sumpit tersebut akan digunakan kelak.

Namun demikian, inovasi yang dilakukan oleh peserta kajian dalam penghasilan sumpit pada masa kini banyak membantu memudahkan kerja-kerja si tukang sumpit. Pada masa dahulu, proses membuat sebatang sumpit agak rumit dan mengambil masa yang lama. Hal ini disebabkan penggunaan peralatan

yang terbatas seperti kapak, parang dan pisau sahaja. Namun kini, peserta kajian telah melakukan inovasi dengan menggunakan gergaji rantai, mesin pemotong dan peralatan elektronik seperti *sander* (kertas pasir). Inovasi tersebut membawa perubahan dan kualiti serta penjimatan masa dalam proses penghasilan sumpit pada masa kini. Belahan dari batang pokok yang dipilih untuk dijadikan sumpit adalah seperti yang ditujukan dalam Gambar 13.

Gambar 13: Stesen pembuatan sumpit

Walau bagaimanapun, pembuatan sumpit pada masa kini lebih cenderung bagi tujuan komersial dan sumber pendapatan kaum Penan. Sumpit tidak lagi dihasilkan semata-mata sebagai senjata untuk berburu. Realiti tersebut sekali gus menggambarkan identiti beradaptasi kaum Penan berasaskan hasil modal semula jadi. Jika dahulu identiti kaum Penan boleh digambarkan dengan memegang sebatang sumpit untuk memburu, kini tidak lagi, sumpit telah menjadi sumber pendapatan mereka dari segi eko-pelancongan. Berikut merupakan hasil temu bual mendalam bersama seorang informan kajian BB3 yang menjelaskan berkaitan bagaimana sumpit kini menjadi senjata dan pada masa yang sama sumber pendapatan kaum Penan:

> *"Saya masih guna sumpit untuk berburu sampai sekarang. Mana boleh tinggal itu, asal usul punya senjata. Tapi sekarang saya juga ada jual sumpit di tamu sana, yang pendek-pendek saja lah. Jual pada turis (tourist), mereka mau beli, suka mereka tengok tu."*
>
> *(Informan BB3)*

Sumpit yang dihasilkan oleh informan kajian adalah seperti yang terdapat dalam Gambar 13, 14 dan 15. Gambar tersebut menunjukkan set lengkap sumpit dan tabung peluru berserta peluru sumpit.

Gambar 14: Sumpit dan tabung peluru

Gambar 15: Tabung peluru sumpit dan isinya

PERBINCANGAN

Berdasarkan hasil kajian ini, identiti kaum Penan dapat difahami sebagai identiti yang terbentuk berasaskan modifikasi modal semula jadi, iaitu satu proses dinamik yang mencerminkan keupayaan komuniti ini menyesuaikan amalan hidup dan penghasilan kraf tangan dalam menghadapi perubahan persekitaran sosial, ekonomi dan ekologi. Dapatan ini menyokong pandangan bahawa identiti komuniti tidak bersifat statik, sebaliknya sentiasa dibentuk dan dilenturkan melalui interaksi berterusan antara manusia dan alam sekitar (Hall, 1996; Jenkins, 2008).

Bagi kaum Penan, pembahagian identiti kepada identiti tradisional dan identiti beradaptasi menunjukkan bahawa perubahan yang berlaku dalam kalangan kaum Penan tidak membawa kepada penghakisan identiti asal, sebaliknya mencerminkan proses adaptasi budaya secara positif. Penemuan kajian ini selari dengan kajian oleh Brosius (1997) dan Dove (2011) yang mendapati komuniti peribumi di Borneo, termasuk masyarakat Penan, cenderung mengadaptasi teknologi dan bahan baharu secara selektif untuk manfaat mereka. Dalam konteks kaum Penan, identiti tradisional dipertahankan melalui penggunaan modal semula jadi dan penghasilan kraf tangan untuk keperluan harian, manakala identiti beradaptasi terbentuk melalui pengubahsuaian bahan dan teknik penghasilan bagi memenuhi tuntutan ekonomi semasa.

Perubahan dalam kaedah pengumpulan hasil hutan yang lebih efisien, termasuk penggunaan peralatan moden, boleh ditafsirkan sebagai sebahagian strategi kelangsungan hidup. Kajian terdahulu mengenai kaum Penan di Sarawak menunjukkan bahawa penyesuaian terhadap persekitaran dan modal semula jadi yang ada di sekitar penting bagi memastikan kelangsungan dalam keadaan tekanan ekonomi dan ekologi yang kian meningkat (Langub, 2004; Lye, 2005). Seiring dengan itu, modifikasi terhadap penghasilan kraf bukan Sahaja meningkatkan kecekapan kerja, tetapi turut berfungsi sebagai sumber pendapatan alternatif untuk sara hidup.

Dapatan kajian ini juga menyokong hujah bahawa perubahan dalam komuniti peribumi Sarawak lazimnya berlaku secara berperingkat dan bukan secara radikal. Seperti yang dihujahkan oleh Langub (2010), masyarakat Penan tidak menolak perubahan secara total, tetapi memilih untuk mengintegrasikan unsur moden yang dianggap sesuai dan bermanfaat bagi mereka. Hal ini jelas ditunjukkan melalui penggabungan bahan semula jadi dan bukan semula jadi dalam penghasilan kraf tangan, serta perubahan dalam kaedah pengumpulan modal semula jadi.

Dari sudut perbandingan dengan kajian lepas di Borneo, dapatan kajian ini konsisten dengan penyelidikan terhadap komuniti peribumi lain di Sarawak yang menunjukkan bahawa inovasi dalam penggunaan sumber sebagai mekanisme untuk mengekalkan kelangsungan budaya, dan ekonomi dan bukannya menghakis identiti etnik (Cramb & Sujang, 2013; Majid Cooke, 2006). Namun demikian, kajian ini menyumbang kepada literatur sedia ada dengan memperincikan bagaimana modifikasi modal semula jadi membentuk dua lapisan identiti, tradisional dan beradaptasi yang wujud secara serentak dan bersifat saling melengkapi dalam kalangan kaum Penan.

Secara keseluruhannya, kajian ini menegaskan bahawa identiti kaum Penan berasaskan modal semula jadi bukan sekadar refleksi amalan ekonomi atau budaya, tetapi merupakan satu mekanisme penting dalam memastikan kelangsungan fizikal, ekonomi, budaya dan identiti masyarakat Penan. Oleh demikian, kajian ini memperkukuh kefahaman tentang identiti kaum Penan sebagai salah satu kaum peribumi di Sarawak sebagai satu entiti yang dinamik, adaptif dan berakar kukuh melalui hubungan antara manusia dan alam sekitar.

KESIMPULAN

Kesimpulannya, kajian ini mendapati kaum Penan mempunyai dua identiti berkaitan dengan modifikasi modal semula jadi, iaitu sebagai identiti tradisional dan identiti beradaptasi. Identiti tradisional merupakan amalan tradisi sejak dahulu lagi. Kaum Penan memiliki identiti tradisional melalui penghasilan kraf tangan. Dalam hal ehwal mencipta kraf tangan, terdapat perbezaan yang ketara berkaitan tujuannya jika dibandingkan dahulu dan sekarang. Pada masa dahulu penciptaan kraf tangan hanyalah untuk kegunaan seharian mereka namun, pada hari ini kraf tangan dihasilkan untuk dipasarkan.. Namun begitu, kemahiran kaum Penan menghasilkan kraf tangan kekal sebagai elemen penting yang membentuk identiti sosial mereka.

Tambahan pula, pada hari ini kaum Penan telah mempelbagaikan kraf tangan yang dihasilkan dengan melakukan inovasi. Inovasi yang dilakukan sebenarnya adalah atas kekangan bahan dan memenuhi permintaan pasaran semasa. Inovasi yang dilakukan oleh kaum Penan berasaskan modal semula jadi, kini menjadi sebahagian dari identiti mereka. Kini mereka memiliki identiti tradisional dan identiti beradaptasi.

Dari sudut implikasi, kewujudan kedua-dua identiti ini mempunyai kepentingan terhadap kelestarian budaya, memandangkan pengekalan kemahiran kraf tangan dan pengetahuan tradisional membolehkan warisan budaya kaum Penan terus dipraktikkan merentas generasi. Selain itu, identiti beradaptasi berpotensi menyokong pembangunan ekonomi masyarakat, khususnya sebagai sumber pendapatan berasaskan peluang sedia ada.

Identiti baru tersebut membawa pendayaupayaan dari segi ekonomi kerana inovasi yang dilakukan adalah untuk memudahkan kaum Penan memasarkan produk kraf tangan mereka di pasaran. Pada masa yang sama, kraf yang dihasilkan kaum Penan bertahan di dalam pasaran tempatan mahupun antarabangsa sebagai sumber pendapatan mereka. Oleh demikian, identiti beradaptasi kaum Penan tersebut secara langsung merupakan satu bentuk kemandirian mereka untuk meneruskan kehidupan dalam dunia moden.

Implikasi kajian ini turut relevan terhadap perumusan dasar berkaitan masyarakat peribumi, khususnya dalam merangka program pembangunan yang lebih peka terhadap budaya dan identiti lokal. Pengiktirafan terhadap identiti tradisional dan identiti beradaptasi secara serentak dapat membantu pembuat dasar merangka intervensi yang tidak hanya menekankan pemodenan ekonomi, tetapi turut menyokong kelestarian budaya dan autonomi kaum Penan dalam mengurus modal semula jadi.

CADANGAN

Oleh itu, dengan adanya inovasi dalam penghasilan kraf tangan, kaum Penan boleh terus mengekalkan identiti mereka iaitu sebagai pengguna tradisional modal semula jadi. Inovasi merupakan satu jaminan bagi mereka untuk terus mempertahankan identiti sosial melalui penghasilan kraf tangan berasaskan modal semula jadi walaupun sumber semakin berkurangan. Pada masa yang sama, situasi tersebut bukanlah bermaksud bahawa mereka tidak mampu menghasilkan kraf tangan dengan keadaan sumber modal semula jadi yang sukar diperolehi. Kajian ini mencadangkan baik sekiranya pembuat dasar boleh merangka polisi yang menyokong kelestarian modal semula jadi dan penghasilan kraf tangan kaum Penan. Selain itu, pengiktirafan hak akses hutan secara lestari dan sokongan latihan untuk menggalakkan inovasi tanpa menjejaskan identiti tradisional. Penggiat industri kraf pula boleh menyediakan bimbingan teknikal, sumber dana, dan strategi pemasaran yang menekankan nilai budaya lestari agar pendapatan kaum Penan boleh dipertingkatkan dari segi ekonomi. Pada masa yang sama identiti sosial mereka tetap diperkukuh.

Walaupun kaum Penan boleh mengatasi masalah kekurangan bahan mentah semula jadi bagi tujuan penghasilan kraf, modal semula jadi perlu terus dipelihara untuk kepentingan mereka. Hal ini kerana melalui akses modal semula jadi kaum Penan mendapat manfaat dari segi ekonomi, sekaligus menambah baik kualiti hidup mereka.

Kajian lanjutan perlu dijalankan untuk menilai impak jangka panjang inovasi terhadap kelestarian budaya, strategi kelangsungan hidup, dan ekonomi kaum Penan, termasuklah perbandingan dengan komuniti peribumi lain di Borneo. Pendekatan ini akan membantu merangka dasar, strategi dan amalan industri yang lebih inklusif dan pada masa yang sama memastikan identiti tradisional dan identiti beradaptasi kaum Penan terus dipelihara dan lebih penting lagi, tetap memberi manfaat kepada kaum Penan dalam kelangsungan hidup kontemporari.

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A Naming, Identity, and Ethnography: The Tatau Community in Sarawak's Tatau District

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ABSTRACT

This paper re-examines the historical identity of the Tatau people in Sarawak, Borneo, challenging persistent misconceptions in both academic discourse and local narratives. Drawing on ethnographic fieldwork, genealogical records, and archival sources, it demonstrates that the Tatau constitute an indigenous Punan community with longstanding roots in the Tatau River basin. The analysis critiques the prevailing conflation of Tatau identity with the Rumah Jalong longhouse, revealing this association as a product of mid-twentieth-century Ibanisation and colonial-era administrative categorisation. By reconstructing territorial affiliations, kinship linkages, and migration histories, the paper argues that Tatau identity historically encompassed a broader network of settlements — including Murung Tuguong, Murung Data, and Murung Muput — extending beyond the demographic and symbolic reach of Rumah Jalong. It also foregrounds the region's multi-ethnic interactions, including longstanding relations with Melanau, Kanowit, Tanjong, and Berawan groups, thereby problematising assumptions of Iban cultural dominance. The study advocates for a more historically attuned and genealogically informed approach to the study of indigenous identity in Sarawak — one that accounts for the fluidity of ethnic categories, the politics of memory, and the contingent nature of community claims over time.

Keywords: Tatau identity; Punan communities; Ibanisation; Ethnic classification; Sarawak ethnohistory

INTRODUCTION

Names carry power. In colonial Sarawak, names were not merely identifiers; they became tools of control, categorisation, and economic extraction — including taxation. As such, they often distorted or oversimplified the complex realities of Indigenous communities. In the Tatau district, this was particularly evident, where histories of migration, intermarriage, and cultural exchange defied the rigid administrative labels imposed by colonial authorities. This paper explores how these authorities attempted to classify and govern the people of Tatau — a community with deep Punan roots and significant ties to neighbouring Melanau populations.

Tatau District lies inland along Sarawak's northern coast. It is a riverine region historically traversed by swidden agriculturalist Punan communities and settled Melanau populations. In academic literature, the Punan group central to this study is typically referred to as Punan Bah. However, I use Punan throughout, acknowledging that the term Punan Bah is both misleading and inappropriate. The Punan in this study are distinct from the formerly nomadic Punan or Pnan groups in the interior of Sarawak and Kalimantan described by scholars such as Bernard Sellato and Lars Kaskija. Unlike those groups, the Punan of Central Sarawak practised swidden agriculture and maintained longstanding ties to settled populations, particularly in the Belaga and Kakus river systems (see for examples Leach, 1950; Nicolaisen, 1976, 1977; Rousseau, 1990; Smith, 2023; Tillotson, 1994). Before Iban and Beketan migrations and colonial boundaries altered the region's demographic structure, these Punan communities engaged in intermarriage, trade, and shifting settlement with neighbouring Melanau (Anon, 1877, 1878). These entangled histories form the basis of the identity politics examined in this paper.

Colonial administrators, constrained by their need for categorisation and control, struggled to account for such complexity. The Brooke and later British administrations relied on ethnographic reports, censuses, and administrative classifications that rested on rigid assumptions: 'nomadic' versus 'settled,' 'primitive' versus 'civilised' ("Census [1947]," 1947; MacBryan, 1922; Noakes, 1950). For Tatau's people, whose origins defied easy classification — were they Punan, Melanau, or something distinct? — these frameworks proved inadequate.

The paper argues that colonial classification systems struggled to define the Tatau people adequately, given their mixed heritage rooted in Punan origins and historical interactions with Melanau communities. This ambiguity was not simply a colonial problem; it became a site of Indigenous agency. The Tatau community actively contested and strategically negotiated colonial naming practices, politicising their identity as a reflection of their unique history and resilience in the face of external control.

This paper asks four key questions: How did colonial administrations categorise the Tatau people, given their Punan ancestry and Melanau interactions? Did they lean towards one identity, invent a new label, or apply inconsistent classifications? What colonial assumptions about 'nomadic' versus 'settled' peoples influenced these efforts? How did the Tatau community respond to these labels, asserting their Punan roots, emphasising Melanau connections, or claiming a distinct Tatau identity? Finally, how did these dynamics shape identity politics during the colonial period?

And it is organised into five sections. Section 1 introduces the historical and conceptual framing for this study. Section 2 reviews existing literature on colonial governance in Sarawak, classification practices, Indigenous responses to colonialism, and the ethnohistory of the Tatau region. Section 3 outlines the methodology, including archival research, ethnohistorical analysis, and critical reading of colonial records. Section 4 presents the findings and discussion: first, reconstructing the historical context of Punan-Melanau interaction in Tatau; second, analysing colonial classification attempts; third, examining Indigenous responses; and fourth, considering the politics of layered identity. Finally, Section 5 concludes by summarising key findings, reflecting on their implications, and proposing directions for future research.

LITERARURE REVIEW

Names, ruins, and memories mark the Tatau. Scholarly research on the region remains sparse and uneven. While various local manuscripts and oral histories circulate informally, academic studies focusing specifically on the Tatau are limited. This review critically examines five major contributions to the field: Benedict Sandin (1970, 1980), Rafidah Abdullah (2020), Yumi Kato et al.(2017, 2020), Cramb and Dian (1979), and Ida Nicolaisen(1976, 1977). It identifies significant thematic concerns across this corpus — mortuary heritage, oral cosmology, demographic change, territorial memory, and classificatory politics — and highlights unresolved tensions that have perpetuated the ambiguity surrounding Tatau identity.

Following Brubaker's (2006)(2004) call to treat identity not as a fixed category but as a field of contested claims and practices, the review frames these studies as attempts to stabilise meaning across unstable historical terrain. The discussion proceeds thematically, while tracing the development of the field, and concludes by situating the present study within these debates.

Monuments remember what people forget. Rafidah Abdullah's (2020) Kajian Terhadap Tradisi Pengebumian Klirieng di Tatau represents the most focused study on the carved burial poles (klirieng) of the Tatau. Drawing on interviews, site visits, and archival records, Abdullah explores how klirieng encode cosmological beliefs, social hierarchy, and ancestral presence. Her work aligns with Connerton's (1989) argument that ritual and bodily practices carry memory, often more durably than text.

However, Abdullah's analysis treats ritual heritage as culturally bounded and internally coherent. Her framing of Rumah Jalong as representative of "the Tatau" elides a more fractured reality — one shaped by successive migrations, ritual discontinuities, and shifting claims to custodianship. In downplaying intra-group variation, she risks reifying what Brubaker (2004) would call a "groupist" vision of culture — one that imagines neatly bounded, homogenous communities rather than historically contingent, relational ones. That said, Abdullah does register the transformation of klirieng practice in recent decades. Her thesis hints, though does not elaborate, on how ritual re-enactment has become a mode of heritage recovery — a point that this study builds upon.

Snakes, spirits, and death shadow Tatau memory. Across Sandin (1970), Abdullah (2020), and Kato et al. (2017; 2020), mythic narratives of catastrophe structure oral histories. These accounts tell of forbidden flesh, tabooed animals, and the sudden collapse of ancestral settlements. In Sandin's retelling, it is the flesh of a great serpent that condemns a longhouse to extinction. In Kato et al., a similar tale emerges — centring on a caterpillar, a curse, and the deaths of children.

Such stories are not folklore in the reductive sense. They are memory's architecture. As Connerton (1989) and Hobsbawm (1992) argue, societies often preserve collective memory not through archives but through ritualised, embodied narrative. These motifs of loss function as explanatory devices: they locate contemporary absence within a moral framework of taboo and transgression. They also persist alongside epidemiological accounts — such as the smallpox outbreaks in the Selitut and Maing rivers noted by Kedit and Chang (2005) — thereby operating on multiple registers of causality. Crucially, these cosmologies help communities make sense of demographic rupture without recourse to colonial or biomedical frameworks of understanding.

Rivers move; so do identities. Sandin (1970) identifies six Tatau subgroups historically tied to distinct tributaries — Murung Tugang, Murung Kakus, and others. By the late twentieth century, widespread intermarriage with Iban, Beketan, Punan, and Malay communities had transformed the demographic landscape. "About 90%," he writes, "had married the peoples of other races in the Anap sub-district" (Sandin, 1970, p. 2). This claim is substantiated by Kato et al. (2017), whose ethnographic data confirm the growing heterogeneity of cultural practice and ancestry.

Such transformations are not merely demographic. They are classificatory. As Brubaker (2004) and Clifford (1997) emphasise, identity categories are not simply inherited — they are claimed, negotiated, and imposed. Cramb and Dian (1979) observe that ritual systems once distinctive to the Tatau were increasingly replaced with Iban or Punan forms, suggesting that identity became performative as much as genealogical. Nicolaisen (1977) proposed a linguistic link between Tatau and Melanau, though she later questioned this connection (pers. comm., 2019). These shifts reflect both historical intermixture and political pressures to conform to recognisable ethnic categories — often as a condition for land rights, religious recognition, or state support.

The land remembers. Material residues such as klirieng, fruit trees, and named sites (ugan) function as mnemonic anchors. Sandin (1970) and Kato et al. (2020) both document ancestral sites marked by klirieng and salong, many of which are still referenced in local genealogies. For many descendants, these sites are not archaeological ruins. They are living evidence — invoked in ritual, invoked in memory, and sometimes, invoked in court.

These spatial markers serve as what Connerton (1989) terms "inscribed surfaces of memory." They link contemporary communities to ancestral claims through material continuity. Kato et al. (2017) note that these mnemonic geographies are regularly used to establish genealogical legitimacy, particularly in contexts of land negotiation. This practice foregrounds what Clifford (1988) calls "routes" over "roots" — where mobility, reoccupation, and renaming form part of how territorial identity is constituted. In Tatau, land is not only the object of memory; it is also its medium.

Names do not stand still. The term "Tatau" has functioned variably as a place-name, ethnonym, and administrative category. Abdullah (2020) tends to treat it as a stable cultural signifier, implicitly equating the contemporary Rumah Jalong community with the historic Tatau. This flattening of temporal and genealogical difference reveals the classificatory violence embedded in colonial and postcolonial ethnography.

Sandin (1970) similarly assumes a unified Tatau identity, though his data derives largely from Rumah Diman Jarap — a community already shaped by Ibanisation. Terms like "Murung Tugong," which Sandin misreads as personal names, were in fact place-names (murung meaning "stream"), wrongly converted into lineal ancestors. This narrative compression reflects a broader problem: the urge to tidy up ethnographic complexity into neat tribal histories. As Brubaker (2004) argues, ethnic labels are often reified by the very bureaucracies and disciplines that seek to study them. Kato et al. (2020) demonstrate how labels like "Punan Bah" — once colonial artefacts — are now actively claimed or rejected depending on context. These dynamics show that classification is not neutral; it is always political.

Benedict Sandin's The Tatau People of the Kakus and Anap Rivers (1970) remains foundational but flawed. His effort to reconstruct Tatau history through oral tradition, genealogy, and place-names was pioneering for its time. But it reveals the limits of working within an Ibanised classificatory schema. Sandin's dependence on a small number of informants, drawn from culturally hybrid communities, colours his conclusions. His work reflects what Hobsbawm (1983) called the "invention of tradition" — the process by which fluid and complex social practices are codified into seemingly ancient, unitary forms.

This is evident in his misinterpretation of murung as personal rather than spatial, a mistake that reappears in Abdullah (2020). Such errors matter not because they are factual lapses, but because they shape how identity is later mobilised — in land claims, cultural festivals, and historical writing. Sandin's version of Tatau history has become the orthodoxy against which others must now position themselves. The politics of memory transmission, as Connerton and Clifford show, involve asymmetries of narrative power. This study challenges that orthodoxy by reassembling fragmented memories, buried names, and marginalised sites into a more layered account.

Despite important contributions by Sandin, Abdullah, Kato, Nicolaisen, and others, the literature remains partial and uneven. Four critical gaps emerge: (1) a lack of attention to intra-Tatau differentiation; (2) the conflation of place-names with personhood in oral traditions; (3) insufficient theorisation of classification as a political process; and (4) limited synthesis across ethnographic, linguistic, and material sources. These weaknesses reflect what Brubaker (2004) warns against — treating identities as fixed rather than fluid, as given rather than contested.

This study addresses those gaps by integrating oral histories, genealogical reconstructions, and material site surveys to map how Tatau identity has been historically constructed, occluded, and reclaimed. It builds on but also critiques earlier work, foregrounding how ritual authority, mnemonic landscapes, and shifting classifications interact in the ongoing politics of recognition. In so doing, it contributes to broader debates on identity, memory, and indigeneity in postcolonial Borneo..

METHODOLOGY

This study adopts a qualitative, historically grounded ethnographic approach to trace shifts in Tatau cultural practices, language use, and identity formation. Fieldwork, conducted intermittently from 2003 to 2025, followed a longitudinal design that enabled deep engagement with kinship networks, ritual knowledge, and personal histories. Primary data were drawn from unstructured interviews with elders, community leaders, and fluent Tatau speakers, alongside focus group discussions across generations in key settlements: Rumah Ado, Rumah Arjey, Rumah Jalong, and Rumah Sylvester Bunsu (Figure 4, 5). These dialogues revealed contested meanings around identity, memory, and linguistic loss. Purposive and snowball sampling ensured broad representation across age, gender, dialect proficiency, and lineage.

Oral histories were contextualised through archival sources—colonial records, missionary accounts, and family-held documents. Site visits to klirieng, caves, and abandoned longhouses anchored narratives spatially, tying memory to territory and ritual obligation. Genealogical mapping clarified patterns of descent, inheritance, and intergenerational language transmission. Analysis followed an iterative, thematic process, guided by a hermeneutic sensitivity to how memory is shaped by positionality, authority, and transmission (Connerton 1989; Clifford 1988). Triangulation and member checking strengthened interpretive reliability and addressed gaps in recall and documentation.

Ethical practice combined formal consent procedures with customary norms of reciprocity. Findings were returned to participants and discussed with local leaders to ensure transparency and accountability. The aim is not merely descriptive but interpretive: to foreground subaltern epistemologies, interrogate colonial frames, and situate identity within the politics of memory and interethnic encounter.

This research contributes to the growing body of scholarship on Sarawak's colonial history and Indigenous ethnohistory. It offers a focused account of the Tatau community's identity politics under colonial rule, illuminating the underexamined relationship between Punan and Melanau groups. In particular, it highlights how colonial naming practices—far from neutral—both reflected and reshaped the identities they claimed to categorise.

Rather than reproduce fixed typologies, this paper traces how Punan memory, ritual practice, and territorial claims evolved through frontier dynamics and political rupture. It shifts the analytical lens from classificatory stability to processual identity-making, foregrounding the interplay of oral transmission, mnemonic authority, and historical contingency.

Tatau identity, in this frame, is not a fixed ethnic essence. It is a relational and historically situated process, shaped by classificatory regimes, political shifts, and memory work. Following Brubaker's (2006) critique of groupism, this study treats 'Tatau' as a category of practice—variously functioning as geographical reference, administrative label, and lived identity. These shifts do not mark confusion but expose the fluid terrain of ethnic naming in Borneo.

Clifford's (1986) concept of "partial truths" frames identity as positional and contingent. Tatau, from this perspective, emerges as a layered formation—shaped by colonial archives, oral traditions, and genealogical claims that overlap and occasionally contradict. Fabian's (1983) critique of the "ethnographic present" further challenges static representations. Rather than anchoring labels in time, this analysis

explores how communities contest, rework, and strategically mobilise identity in shifting historical contexts.

Memory, in this view, is not passive inheritance. It is a social and ethical practice (Lambek 1996): a means of legitimising belonging, asserting place, and negotiating recognition. Identity becomes a form of memory work—situated, strategic, and emotionally charged. These orientations frame the three-part analysis that follows: beginning with the layered semantics of Tatow, Taytow, and Tatau; moving to the rise of Tatau tulin as a longhouse identity; and concluding with the contestation of ritual and historical authority in the Tatau basin.

FINDINGS & DISCUSSION

Fluid Labels, Fixed Identities: The Historical Semantics Of Tatau

'Tatau', like the cases Metcalf studied in Baram, resists simple classification. "Ethnicity," he reminds us, "is an object of research, not a preliminary to it. A mere list of proper names makes no sense without an understanding of the nature of longhouses … their communal politics, and the pattern of trade that linked them together" (Metcalf, 2010, p. 28). Tatau may look like a proper name, but it cannot — as Sandin and others presumed — be taken uncritically as an ethnic category. Such assumptions skip over the actual work of interpretation. Without understanding the community's structure, political life, and economic ties, the label obscures more than it reveals.

Tributary Logics and the Name Tatow

The Punan were known to the Brunei court, not only through contact but also through intermarriage and political subordination as subjects (see Figure 2). However, they did not appear in Brunei records under a single ethnonym. Instead, they were identified by at least three different names — each corresponding to the rivers they inhabited. In Borneo, names often travelled through tributary systems rather than along ethnographic or tribal lines. In Brunei-era sources, "Tatow" functions not as an ethnic label but as a geographic signifier (Moor, 1839, p. 133). As early as 1839, Tatow referred to communities dwelling along the Tatau River, likely named for their location rather than their ritual or genealogical status. Within Brunei's administrative logic, such naming was pragmatic: affiliation with a river — rather than precise ethnic origin — was sufficient for the purposes of tribute, taxation, and allegiance. Orang Tatow, in this sense, simply denoted "people of the Tatau River," irrespective of internal cultural or genealogical distinctions.

This Brunei logic of identification prioritised place over identity. Tatow was a category of location within a fluid tributary world, not an assertion of ethnic boundary. The act of naming, in Brubaker's (2004) terms, was a category of practice — a functional designation tied to administrative utility rather than cultural essence.

Documentary evidence supports this reading. Personal genealogical manuscripts , Native Court records, and archival materials accessed through the generosity of Penghulu Awang Dewa bin Awang Tajuddin and his kin confirm that Tatow referred specifically to a Punan lineage. These sources trace the early leaders of the Tatau region to a prominent ancestor named Saghe'. His descendants — including Paso and Orang Kaya Saghieng (or Saging) — maintained strong ties with the Brunei court. Paso married a Brunei noblewoman, Uzong Tijah. Saghieng travelled to Brunei, where he was not only pardoned but also rewarded (refer Figure 2). These encounters suggest the lineage was not just known to Brunei but actively drawn into its tributary network.

Colonial Codification and the Emergence of Tatau

With the advent of Brooke rule, naming conventions shifted. The term Tatau began to circulate in colonial censuses and administrative reports, taking on the form of an ethnic label. In 1887, Brooke officer Q.A. Buck, for example, distinguished Tatau from the Punan in his census of the Tatau population (Buck 1887). In contrast to Brunei's fluid pragmatics, Brooke-era governance favoured fixed categories. Identity became not just a tool of enumeration, but an instrument of control — essential for regulating trade, administering justice, managing labour, and shaping territorial policy. The term Tatau, once a geographic descriptor, hardened into an ethnonym — a transformation reinforced by the language of censuses, border patrols, and tax records.

The classificatory distinction did not remain stable for long. Under the Interpretation Ordinance of 1933, colonial authorities reabsorbed Tatau into the broader ethnic category Punan (Brooke, 1933). The move marked a shift in administrative logic: from distinguishing subgroups for local governance to consolidating identities for bureaucratic coherence and policy uniformity across the colony. Post-war ethnographies entrenched this fixity even further. Sandin (1970, 1980), Nicolaisen (1976, 1977), and Kato et al. (2017, 2020) routinely treated Tatau as a bounded group, seldom interrogating the term's layered past. As their accounts became canonical, they flattened earlier nuances. The name Tatau thus emerged as a tool of administrative legibility, obscuring both earlier self-descriptions and the more porous affiliations of Brunei's tributary world.

Linguistic usage shifted accordingly. Linou Tatau — "Tatau people" — was once a fluid expression of river-based affiliation, not a claim to bounded ethnicity. Over time, however, it came to be read as evidence of a distinct ethnolinguistic group, reinforcing the colonial project of fixing identities into legible categories.

A separate but related development emerged in the late 20th century with the rise of the term Orang Ulu. Coined as a political umbrella category, Orang Ulu brought together various upriver communities of interior Sarawak — including Kenyah, Kayan, and some Punan groups — under a shared label. Though sometimes retrospectively applied to groups like those at Rumah Jalong (Abdullah, 2020, p. 47), the term had no currency during the colonial period. Its emergence was shaped not by colonial ethnography but by post-independence political movements, most notably the formation of the Orang Ulu National Association (OUNA) in the 1960s and 1970s (Metcalf, 2010, pp. 20, 78). These shifts — from Linou Tatau to Tatau as ethnonym, and from local designations to Orang Ulu as regional identity — reflect broader changes in how identity was articulated, categorised, and mobilised over time.

Genealogical Memory and the Endurance of Taytow

Oral tradition offers a counterpoint to both tributary pragmatism and colonial codification. Within Punan genealogies, the term Taytow continues to circulate — not as an imposed name, but as a self-referential claim to river-based belonging and ancestral descent. Leaders such as Pemancha Kupa Kanyan and Tr Bilong Keseng refer to Taytow to describe the descendants of Saghe', whose lineage has long been tied to the Tatau River. This usage is not nostalgic; it reflects a living mode of identity that persists in speech, ceremony, and social memory — particularly in longhouses like Rumah Ado Bilong (see Figure 5).

This genealogical strand underscores Clifford's (1986) insight that all identity claims are "partial truths" — shaped by positionality, narration, and historical circumstance. Taytow, as a term, captures a kin-based understanding of belonging that neither the Brunei label Tatow nor the colonial construct Tatau can fully contain. Rather than signalling separate communities, these names represent overlapping registers of recognition.

My own fieldwork confirms this fluidity. In both rural Sarawak and urban Kuala Lumpur, everyday introductions rarely began with "what ethnicity are you?" but rather with "kamu orang mana?" — where are you from? Answers typically invoked rivers, longhouses, or districts before broader categories. A Kenyah friend might say "Orang Belaga" long before identifying as Orang Ulu. When I replied "Punan," there was often a pause — then a nod of contingent recognition, shaped by shared assumptions about place, language, and indigeneity.

Colonial records echo this ambiguity. The term Punan was variously applied — sometimes narrowly, to Rejang and Tatau groups (Roth, 1896, p. 37), and at other times more broadly, to mobile riverine peoples across Borneo (Holmsen, 2006; Kaskija, 2012; Sellato, 2002). For the Punan of Tatau, it made sense to be known outwardly as Orang Tatau, while internally maintaining genealogical and ritual continuity with the wider Punan network.

Tatow, Taytow, and Tatau are not interchangeable labels for a singular identity. Nor do they represent distinct communities. Each emerged within a particular system of recognition: tributary diplomacy, colonial taxonomy, or genealogical narration. The name Tatow functioned within Brunei's riverine logic of rule; Taytow lives on in kin memory; Tatau arose through administrative simplification. To read these terms as synonyms is to erase the contexts that produced them. To attend to their differences is to grasp the historical processes through which communities like the Punan Tatau have been named, known, and at times misrecognised.

Taken together, the evidence suggests that Tatow, as used in Brunei-era sources, referred to the river-based Punan community associated with Saghe' and his descendants. These individuals are remembered in Punan genealogies as Taytow, and their identity was later formalised under the term Tatau in colonial administrative records. Notably, their descendants continue to reside in the Kakus region today, particularly in longhouses such as Rumah Ado Bilong. The variation in naming does not signal the existence of distinct communities, but rather reflects the layered and shifting registers through which identity has historically been recorded and interpreted — whether through courtly tribute systems, colonial categorisations, ethnographic writing, or Indigenous oral tradition.

Rather than resolving this variation into a single fixed meaning, it may be more accurate — and more historically responsible — to understand these names as windows into the contexts that produced them. Tatow was functional for Brunei administrators; Taytow remains meaningful in local genealogical memory; Tatau emerged from a colonial classificatory imperative. Each carries weight, but each also flattens other dimensions. Attending to these layers allows us not only to clarify who the Tatow were, but also to better understand the processes through which communities like the Punan Tatau have been named, recognised, and sometimes misrecognised over time.

The Emergence Of 'Tatau' As A Longhouse Identity: Rumah Jalong, Rumah Sadap, And Rumah Sylvester Bunsu

Amid the shifting meanings of Tatow, Tatau, and Taytow—from tributary node to census category—certain longhouse communities have anchored themselves in the term Tatau as a living, evolving identity. This section examines how Rumah Jalong, Rumah Sadap, and Rumah Sylvester Bunsu invoke Tatau tulin ("true Tatau") not as a static inheritance, but as a claim actively sustained through practice, memory, and negotiation.

These assertions emerge not in spite of demographic flux, but through it. Though now predominantly Iban in composition, these longhouses maintain their Tatau identity through ritual continuity, oral genealogies, leadership succession, and kinship ties. Their persistence reflects not a quest for genealogical purity, but an adaptive rootedness in response to historical disruption. Leaders such as

Diman Jarap played a crucial role in this process, maintaining links to an older political identity even as the social landscape changed.

Each community illustrates how Tatau became politically useful. Present-day Rumah Jalong traces its origin to a community founded by Gelimang in the late 19th century. Around 1883, when Nyipa was appointed penghulu, he relocated the community slightly downriver to the Jatan River, nearer the administrative centre (Gueritz, 1884). Gelimang, who had been in dispute with Nyipa—particularly over access to birdnest caves in Kakus (Low, 1875), sought to maintain his community's autonomy. The dispute went to court, where Gelimang prevailed. Despite this, Nyipa retained considerable political power, using his new position as penghulu to reassert control over the birdnest caves. Although related by blood, the dispute led to Gelimang's departure from Nyipa, and he moved his followers to the Buan River.

Unable to attract many Punan followers, Gelimang's community became a mixed Punan-Iban longhouse. This was the earliest known community of its kind in the Tatau basin, but it did not survive beyond Gelimang's death in the early 20th century. Gelimang passed away several years before Nyipa, who died in 1909 (Owen, 1909). Following Gelimang's death, most of the Punan in his community relocated to Kakus, where the Punan had long been confined. Nyipa himself moved to Kakus around 1894, and his former longhouse at Jatan was converted into quarters for government officials.

The Iban faction of Rumah Gelimang, however, was barred from the Kakus River. Instead, during this period, Sarek—whose lineage connected him to the Sibiew River—persuaded the Iban to remain in the Buan-Belak area, which had been abandoned by the Punan. Diman Jarap, Gelimang's grandson, supported Sarek and later succeeded him. It was through this connection that Diman, in turn, asserted the community's "Tatau asli" (original Tatau) identity—despite the now overwhelming Iban composition of the community and his own marriage to an Iban woman (Muda, 2010; Sidi, 2017). This assertion of "Tatau tulin," which later became identified as "Tatau tulin" by the Jalong, strategically linked the community to the klirieng at Rantau Belak, thus preserving ritual associations with the Punan while accommodating the growing Iban majority.

Similarly, Rumah Sadap, established by Sadap Anggat—Jalong Anyik's nephew—mirrors this trajectory. Rumah Sylvester Bunsu, founded by Ganyun Mok's descendants, relocated to Kakus with the consent of Punan headman Bilong Keseng, navigating both administrative directives and strategic alliances. What these communities share is not a singular ethnic essence but a mode of positionality. Their self-identification as Tatau reflects a conscious engagement with institutional legibility—using historical labels to claim recognition, land rights, and cultural legitimacy in contemporary Malaysia. Rather than challenging their authenticity, these claims illustrate how identity is made resilient: through performance, narration, and alignment with older labels reinterpreted to meet present needs.

In this light, Tatau is not a residue of colonial naming. It is a living framework through which longhouse communities assert belonging, continuity, and visibility in a landscape still structured by historical categories of recognition.

Claiming 'Tatau Tulin': Memory, Identity, And The Social Life Of Historical Claims

Ethnic and territorial identities in Borneo's frontier zones have never been stable inheritances. They are continuously reconfigured across generations—shaped by migration, intermarriage, shifting administrative boundaries, and evolving claims to cultural legitimacy. This dynamic is particularly salient among longhouse communities such as Rumah Jalong, Rumah Sadap, and Rumah Sylvester Bunsu, which continue to articulate themselves as Tatau tulin, or "true Tatau." While these assertions gained greater clarity in the mid-twentieth century, especially under the leadership of figures such as Tuai Rumah Diman Jarap, their significance lies not in unbroken descent but in the social work they perform.

As Connerton (1989) argues, memory operates less as a static archive than as a socially embedded practice—one through which communities negotiate continuity amid rupture. Within this framework, Tatau functions not merely as an ethnonym but as a flexible idiom of belonging: a rhetorical and cultural assertion of rootedness in the face of demographic transformation and political marginalisation.

Although many residents now identify linguistically and ethnically as Iban, the designation Tatau tulin remains central to collective self-understanding. Its endurance suggests that the term's value lies not in strict genealogical lineage but in its capacity to symbolise authority, presence, and legitimacy. As Hobsbawm (1983) reminds us, traditions often emerge in response to historical dislocation—serving to anchor communities in times of uncertainty. In this light, Tatau tulin is better read as a performative claim than as an empirical descriptor: a way of reconstructing coherence from fragmented historical threads.

It was not always so coherent. The legacy of Saghe' did not yield a single, unbroken line of ritual authority. Rather, it fractured. After the deaths of Banun, Nyipa, and Siki, leadership among the descendants of Saghe' became contested. The absence of clear succession and the fragmentation of klirieng authority led to competing genealogical narratives. These fractures, rather than discrediting claims to Tatau tulin, opened space for their reinvention. As later longhouses such as Rumah Jalong asserted ties to Gelimang and Rantau Belak, they did so not only by appealing to ancestry but by strategically reassembling fragments of ritual history. In this context, identity was not inherited intact but reconstituted in moments of uncertainty—performed through narratives, ceremonies, and claims to klirieng custodianship.

Colonial governance amplified these dynamics by institutionalising ethnic boundaries that often obscured local complexity. As Li (2000) and Brosius (1992) have shown, colonial administrators in Borneo imposed rigid distinctions between 'nomadic' and 'settled' populations, privileging the latter as legible and governable. These categories, far from neutral, carried material consequences—denying certain groups land rights and political recognition. In the Tatau region, this logic shaped access to land in places like the Kakus headwaters, where residence and resource rights were contingent upon being officially classified as 'Punan.' Yet such administrative labels frequently masked far more entangled histories of alliance, mobility, and shared ancestry.

The example of Rumah Sylvester Bunsu illustrates this complexity. Although today it is regarded as an Iban longhouse, historical settlement was permitted only through endorsement by Punan leaders—a reminder that local legitimacy has often depended less on formal classification than on negotiated relationships. Within such a context, the invocation of Tatau tulin must be understood as a response to the classificatory violence of colonial and postcolonial statecraft: an effort to reclaim identity and place within an imposed hierarchy of indigeneity.

Against this backdrop, Abdullah's (2020) analysis of klirieng culture, based primarily on data from the Rumah Jalong community, warrants further contextualisation. While her account provides valuable insight into contemporary engagements with ritual and cultural heritage, it also highlights the interpretive tensions that arise when symbolic affiliation is treated as equivalent to cultural transmission. Her own data reveal that Rumah Jalong, founded only in the early twentieth century, retains limited knowledge of the ritual and genealogical functions historically associated with klirieng. Nonetheless, the community is presented as a primary inheritor of this tradition.

This interpretive slippage becomes more pronounced in the discussion of social stratification. Abdullah records the existence of four social categories: maren (aristocrats), aweh (intermediate class), rakyat biasa (commoners), and ulun (bondspeople or slaves) (Abdullah 2020, p. 73). However, both maren and ulun are terms historically associated with Kayan and Kenyah societies in Central and Northern Borneo (Rousseau, 1974, 1979). In contrast, earlier sources from the Tatau region—such as Jarap (1961) and Saad (1971), which Abdullah herself cites—refer instead to a different classificatory system: Tengelan

(aristocrat) and Melagi. Well, these two also the terms used by Punan in their stratification Panyin, and Lipen. These older terms, used by the Punan and their neighbours, reflect a distinct logic of social organisation, tied to different ritual and political structures.

This is not to suggest an oversight, but to highlight how interethnic contact and broader regional influences may have shaped the classificatory language adopted by later generations at Rumah Jalong. Such shifts are to be expected in communities navigating dynamic historical terrains. Yet they also underscore the importance of distinguishing between inherited terms and those introduced or reinterpreted in the context of shifting sociopolitical landscapes—particularly when such terms inform broader arguments about ritual continuity and ancestral authority.

Indeed, had Abdullah extended her ethnographic engagement to include Punan communities in the Kakus—whose links to Tatau she acknowledges—a more historically grounded interpretation of klirieng might have emerged. Among these groups, klirieng serve four primary functions: as tanom Tengelan (mausolea for aristocrats), tada' baliu (territorial markers), tada' uba' or selita' (carriers of ancestral narrative), and lasan pesupa (ritual oath sites in land and kinship disputes). These are not merely symbolic forms—they represent embedded practices of memory, law, and place-making.

It may appear ironic that the terminological distinctions discussed here were already available in the references Abdullah engages. Both Jarap (1961) and Saad (1971), included in her bibliography, document the use of Tengelan and Melagi as designations for aristocratic and intermediary classes, respectively—terminology that predates and differs from the Kayan-Kenyah lexicon employed in her study. This is not a question of fidelity to the archive, but of interpretation: how one reads available sources in light of historical specificity and ethnographic complexity.

Ultimately, the concept of Tatau tulin must be understood not as a fixed ethnic inheritance but as a mode of historical and political engagement. It reflects not a seamless continuity but a repertoire of symbolic resources through which communities make sense of their position in shifting political landscapes. These claims to being Tatau tulin are acts of memory work: situated efforts to articulate legitimacy, rootedness, and cultural authority in a world where the ground beneath identity is often anything but firm.

CONCLUSION

The historical identity of the Tatau people cannot be contained within the administrative shorthand of colonial ethnography or the cultural flattening of postcolonial nation-building. This study has revisited that identity by drawing together genealogies, oral histories, and archival traces to reconstruct a more layered past—one in which the Tatau emerge not as recent arrivals, as Tillotson (1994) suggested, but as an indigenous community with deep ancestral and ritual ties to the Tatau River basin.

Their story is not only embedded in places like Murung Tuguong, Murung Data, and Murung Baliu, but also in the social fabric woven through kinship with Punan, Melanau, Kajang, and other riverine groups. That fabric has been strained, not erased, by waves of migration, intermarriage, and bureaucratic reclassification.

One of this paper's central interventions has been to problematise the treatment of Rumah Jalong as the archetype of Tatau identity. While it plays a visible role today in regional ritual life, its demographic and cultural profile reflects significant Ibanisation—part of a wider pattern of assimilation that masks older ethnohistorical trajectories. The consequence has been a strategic reworking of memory, one in which Tatau tulin is not a genealogical truth but a symbolic and political assertion.

In challenging the notion that Tatau identity is simply a variant of Iban-ness, this paper points instead to a complex history of interethnic entanglement and ritual autonomy. These findings unsettle dominant narratives and urge a more situated reading of identity—one that privileges lived experience, memory work, and place-based affiliations over reductive categories.

As one elder dryly observed, in Punan:

"Taytow kayto, 'Tatau' ka kopat. Na, 'Tatau' lan si to ro."

"We say Taytow, they say Tatau. And now, we've all become 'Tatau' — that is, we've all become 'silly.'"

His irony cuts to the core of the problem: when external labels harden into official truths, they can obscure more than they reveal. But his humour also offers a clue to survival — to how communities like those in Tatau negotiate identity not through fixed categories but through adaptability, wit, and historical consciousness.

Reclaiming these histories, then, is not just an academic gesture. It is a refusal to be spoken for. It is an invitation to listen more carefully — to what names meant, to how they changed, and to what they still carry.

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APPPENDIX

FIGURE 1: Ganyun Anak Mok, accompanied by the Tatau District Office, visited the klirieng site at Rantau Belak on 5 April 2010. (Photo courtesy of Sylvester Bunsu Ganyun)

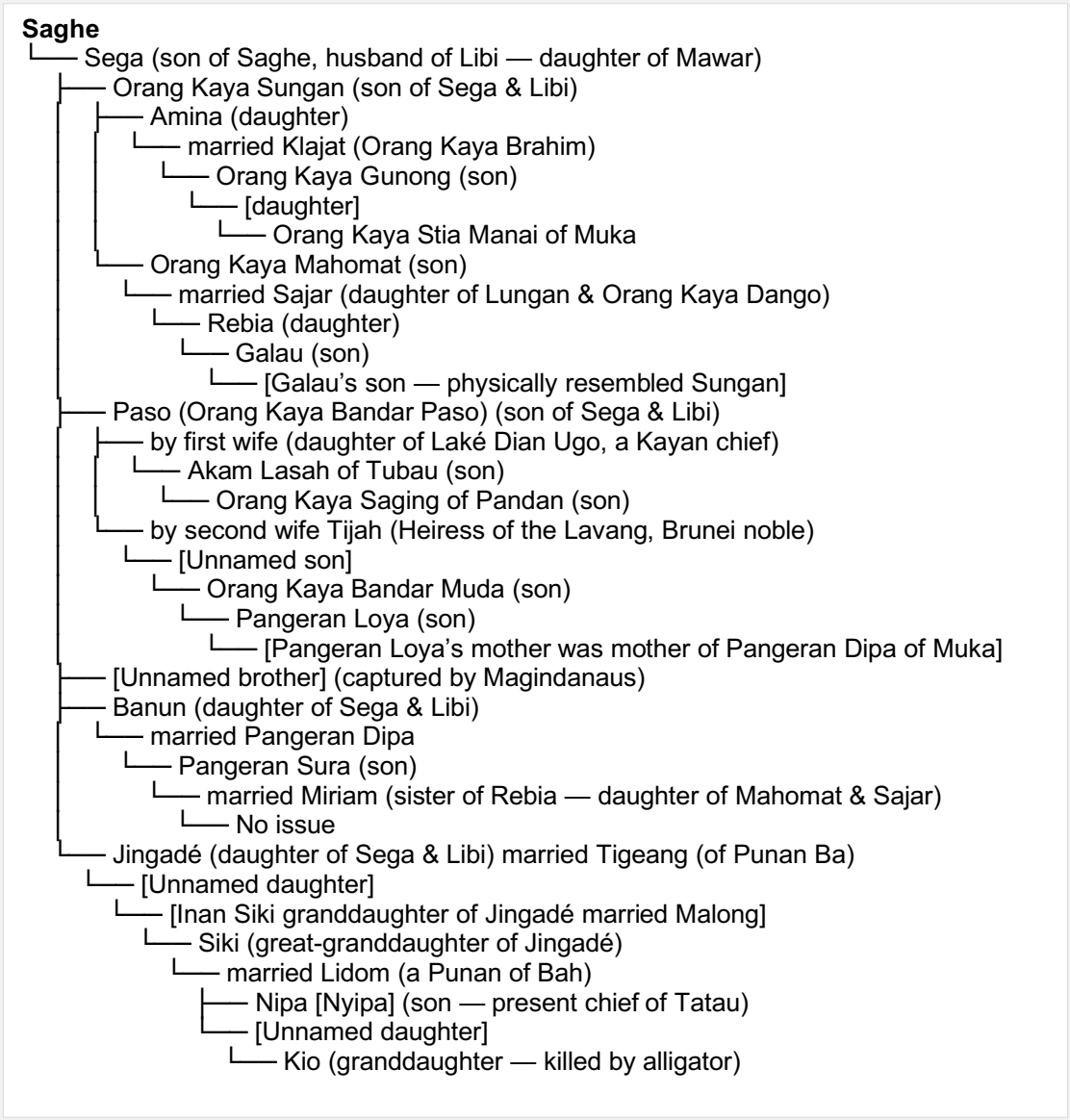

FIGURE 2. Genealogy of Saghe, the precolonial paramount chief of the Tatau Punan during the period of Brunei rule. (Sources: The Sarawak Gazette Anon (1877a, 1877b, 1878)

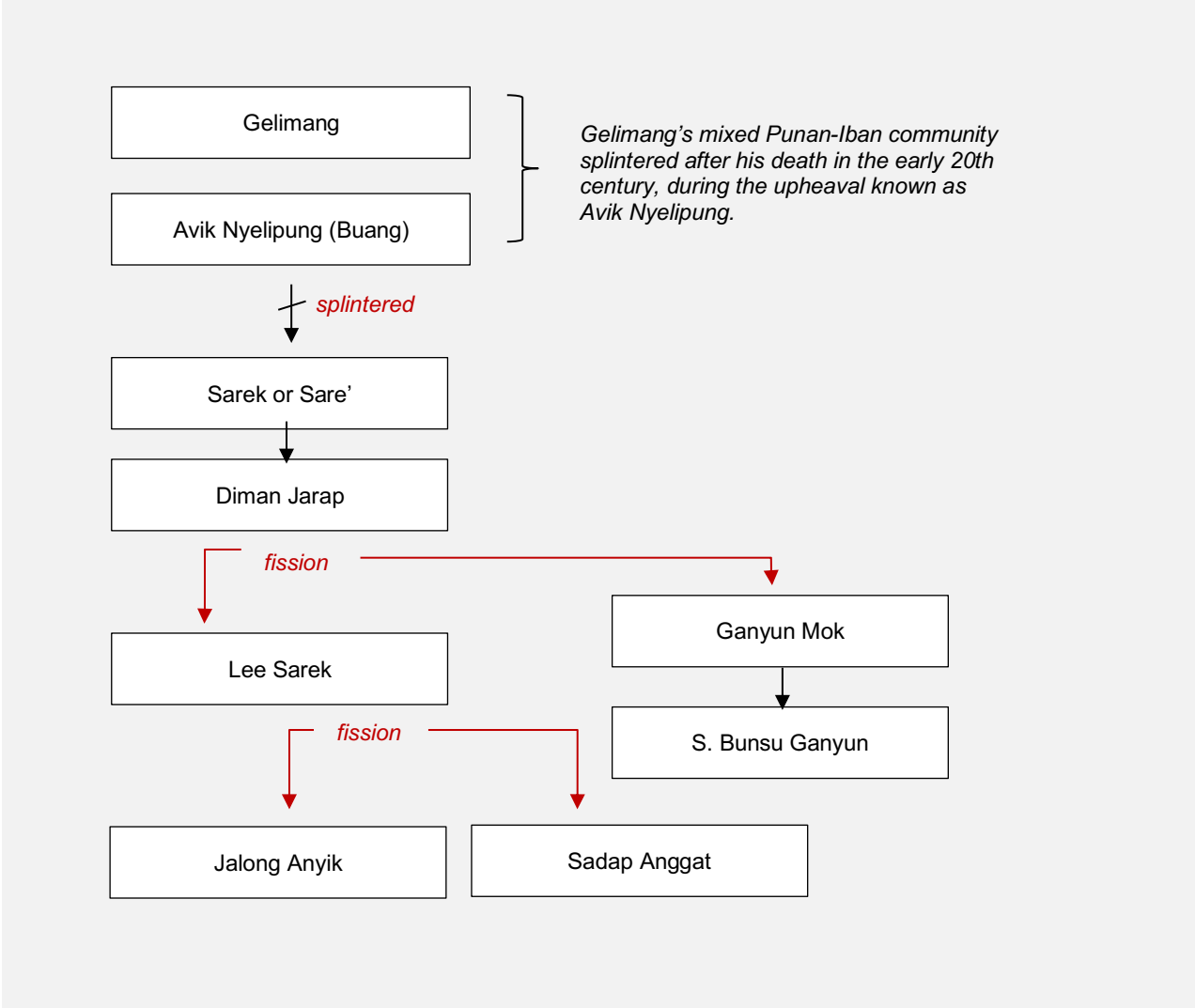

FIGURE 3.Leadership succession of Rumah Gelimang traces its origins to Gelimang and concludes with Avik Nyelipung (Buang). The succession of Rumah Sarek continued through to Diman Jarap, after which the longhouse underwent a fission around 1975, resulting in the formation of two new communities: one led by Lee Sarek and the other by Ganyun Mok. Ganyun was later succeeded by his son, Sylvester Bunsu. A subsequent fission of Lee Sarek's longhouse in the 1990s gave rise to Rumah Jalong Anyik and Rumah Sadap Anggat.

FIGURE 4. Interview with Tuai Rumah Jalong Anyik (left) and his brother Nyengit Anyik, conducted at their family residence in Rumah Jalong Anyik, Nanga Buan, Tatau, on 13 September 2018. The discussion focused on oral histories, genealogical knowledge, and the community's claims to klirieng heritage.

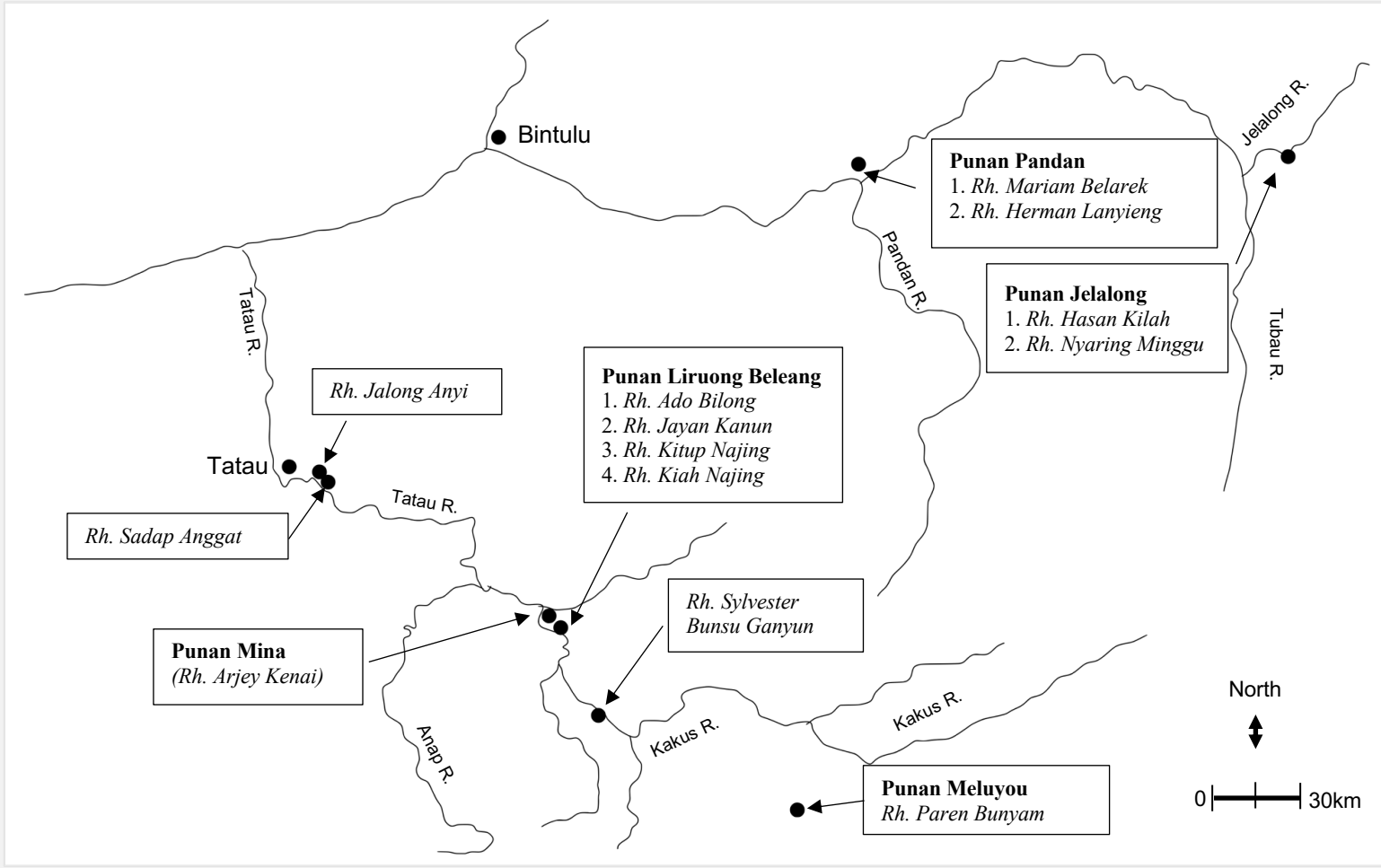

FIGURE 5. Map of Bintulu Division showing the locations of Punan settlements in the districts of Tatau and Sebauh.

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History of Coffee Farm Development with Local Communities and Wildlife in Ulu Baram, Sarawak

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ABSTRACT

In the upper reaches of the Baram River (hereafter Ulu Baram) in the central highlands of Borneo, there is a movement to conserve biodiversity effectively and sustainably in areas outside national parks and wildlife reserves. This initiative is led by local communities with cooperation from the state government. This study examines a coffee farm in Ulu Baram as a case study, analyzing the impacts of the farm's development strategies on the local community from both socio-economic and ecological perspectives. The owner has maintained operations for 20 years, keeping revenues just above breakeven. Coffee cultivation requires a certain level of labor, making it a space for community-building and enabling different ethnic groups to collaborate. The coffee farm caused limited environmental disturbance and did not lead to a decline in wildlife or significant changes to the forest landscape. The presence of medium-to-large animals, including rare species, and the documentation of their reproduction in the adjacent secondary forest suggest that farm development and wildlife survival can coexist under sustainable management.

Keywords: Ulu Baram; coffee farms; mammal conservation; community-level initiatives; mountain science

INTRODUCTION

National parks and other nature reserves are crucial mechanisms for preserving biodiversity, yet they can also threaten the livelihoods of the indigenous peoples who originally lived there. There are many precedents in which people who are deeply involved with local forests have been excluded from using those forests due to the establishment of national parks (Neumann 1998; Robbins 2004). Therefore, in recent years, the importance of areas where nature has been protected because of the livelihoods and voluntary efforts of local communities has been reviewed (Berkes, 2021; Charles, 2021).

In March 2023, the International Tropical Timber Organization's Executive Director, Sheam Satkuru, and Sarawak Forest Department Director, Hamden bin Haji Mohamad, signed an international cooperation agreement to effectively conserve biodiversity in areas outside of nature reserves. The target area is the Upper Baram basin in the central highlands of Borneo (Fig. 1A).

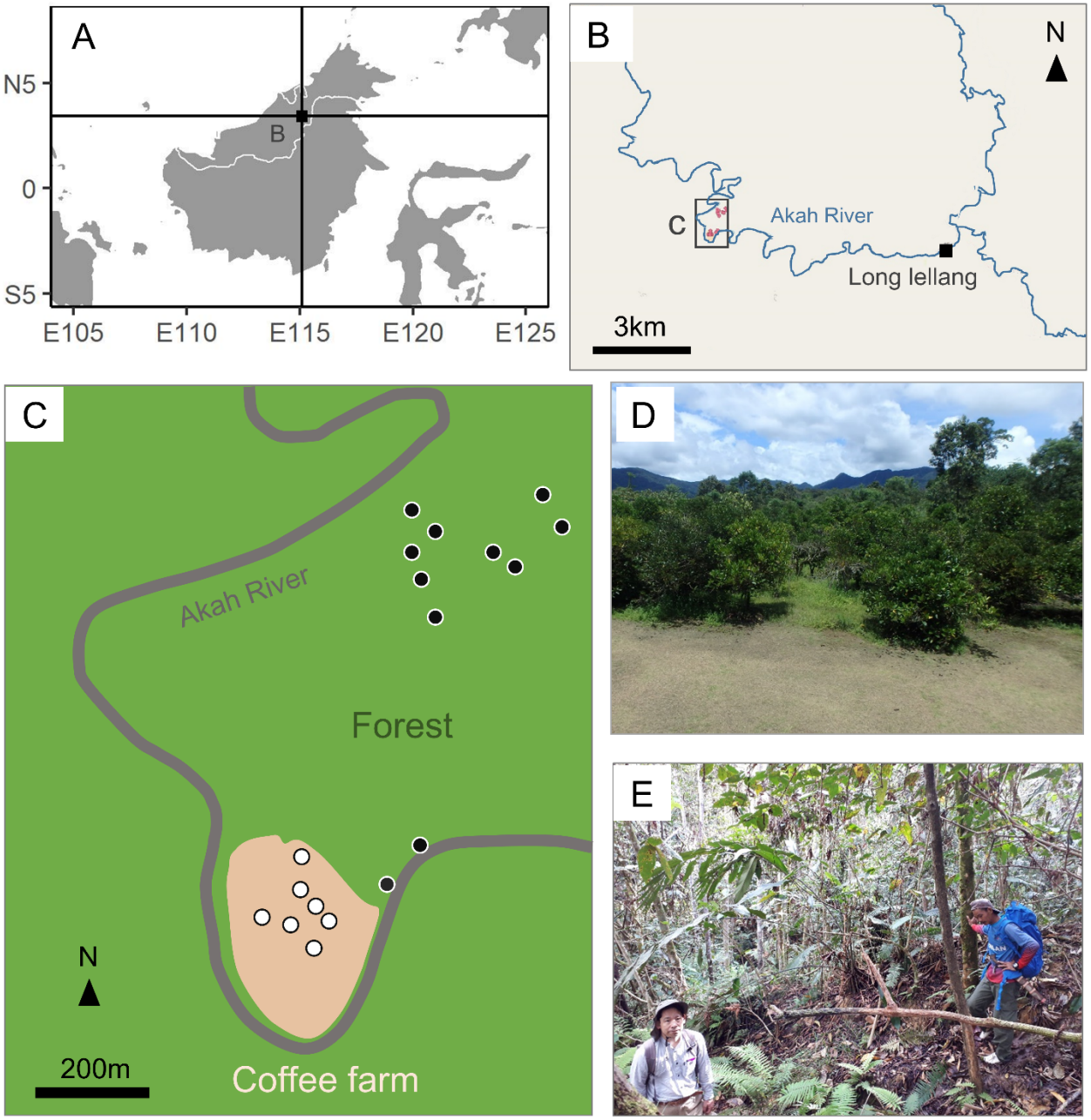

FIGURE 1: *A, B.* Location of the survey site. *C*. The black circles in the secondary forests. The white circles indicate the locations of cameras installed in the coffee farm. *D.* Setting up the cameras. *E.* Coffee farm landscape.

This area is known as Ulu Baram in Malay, meaning "upstream" or "inland." It is the only area outside protected zones like national parks where substantial stretches of primary forest remain (International Tropical Timber Organization 2021). Nearly all other primary forests in Sarawak have been depleted by commercial logging. The people who lived in and protected the forest were an indigenous people called the Penan. In late 2011, 18 Penan communities in Ulu Baram announced a concept called the Penan Peace Park (TPPP; Penan, 2011). In 2016, the Sarawak state government agreed to negotiate with Penan representatives. The government expanded the designation to include areas inhabited by twenty-four other indigenous communities—the Kenyah, Kelabit, and Saban—and adopted the name Upper Baram Forest Area (UBFA).

How can biodiversity conservation and autonomous survival of indigenous communities be balanced in the conservation and utilization of their sites? The impact of human activities on tropical rainforests varies depending on the scale of land use, the species involved, the habitats affected, and methods of alteration (Gerder et al., 2009). For example, the loss of canopy habitats due to tree cutting can have a negative impact on the occurrence of arboreal animals, while the improvement of light conditions due to cutting can have a positive impact on herbivores that feed on understory vegetation (Malhi et al., 2022). It has also been reported that bat diversity in forests following shifting cultivation was lower than in primary forests, while the species richness of small mammals and herbivorous scarab beetles was equal to or even higher than in continuous primary forests (Kishimoto-Yamada et al., 2011; Takano et al., 2014). Some studies have demonstrated that forests managed by Indigenous peoples have both high biodiversity and economic value (Mulu et al., 2020; Leo et al., 2022).

This study used a coffee farm within the UBFA as a case study to examine the impacts of the farm's development on local communities from both ecological and socio-economic perspectives. Mr. Francis Aran (hereinafter referred to as Mr. F), a Kelabit man, pioneered coffee farming in this area. He began seedling cultivation on 0.3 hectares of land in 2007 and expanded to 6.9 hectares by November 2009. His farm is located outside the residential village of Long Lellang. Focused on Mr F's farm management, the research questions (RQs) for this study were:

RQ1: How has a locally managed coffee farm been maintained over the past 20 years?

RQ2: What kinds of relationships between Kelabit and Penan have emerged through the development of the coffee farm?

At the same time, understanding the effects of coffee farm management on forest biodiversity is essential. Regarding biodiversity conservation in the coffee farm, the study focused primarily on terrestrial mammals and birds. These taxonomic groups not only occupy a high trophic level in the local food web but also provide a source of protein and cash income for residents. However, their habitats are modified by farm development, which can affect their availability. Furthermore, animals are closely related to plants, contributing to material cycles and ecosystem function. Therefore, the RQs related to biodiversity were:

RQ3: What is the fauna of the farm and the surrounding forest?

RQ4: How does the coffee farm affect mammal and bird faunas?

METHODOLOGY

Study Site

Mr F's coffee farm is located along the Akah River, a tributary of the Baram, and are about a 40-minute ride by outboard motorboat from Long Lellang (Fig. 1B). The farm is adjacent to the river and forest, and the boundary between the farm and forests is covered with young trees and ferns. The forests designated as the target area were adjacent to the farm, and their distance from the farm was about 700 m (Fig. 1C). These forests are secondary forests that have been logged, still retaining tall trees exceeding one meter in diameter at breast height. Primary forests without a history of commercial logging also extend across the river.

Economic and Social Survey

The authors have visited Long Lellang for a few days or weeks every year since 2009. During these visits, they have conducted participant observation and interviews within the village and on the farm. Some interviews with Mr F have been previously documented in Japanese (Bundo, 2025). Kelabit people traditionally make their living through farming. As of 2021, Long Lellang's population was around 100, but many have now moved outside the village, such as to the coastal town of Miri. The aging population is progressing along with this depopulation. Residents use the forest near the settlement for timber and collect non-timber forest products (rattan, fish, terrestrial vertebrates, wild edible plants, etc.).

In the surrounding areas of Long Lellang, several Penan communities live in scattered settlements, each comprising several dozen people. Many live in primary forests, where they gather various forest products, hunt, and cultivate rice (Kanazawa, 2021). Although timber companies have repeatedly attempted to enter this area, the Penan communities oppose commercial logging and have protected the primary forest from logging operation through road blockades.

Natural Ecological Survey

For the fauna survey, a total of 39 camera traps (Bushnell Trophy Cam E3) that recorded video in response to movement were installed on the coffee farm (20 cameras) and in the forest (19) from March 25 to October 23, 2023. Cameras were spaced 50–80 meters apart. However, due to theft and humidity-related malfunctions, the final count was seven cameras on the farm and ten in the forest (resulting in 1,245 camera days on the farm and 1,896 in the forest). Cameras were mounted on tree trunks approximately 100 cm above ground level, angled downward at 20 degrees (Fig. 1D). No bait or lures were used to attract animals. The cameras were set to operate 24 hours a day. The cameras recorded 10 seconds of video per trigger, with a 15-minute lag between triggers to reduce battery consumption.

The date, time, and species of the animals were recorded from each video. They were identified to the species level, focusing on birds and medium-to-large ground-dwelling mammals. However, due to difficulties in species identification, mouse-deer were recorded to the genus level (genus *Tragulus*), although some individuals were identified as *Tragulus napu* based on chest patterns. As the site was located near the equator at 3°N latitude, the period from 6:00 to 18:00 was considered daytime throughout the study period, with all other times considered nighttime. To assess sampling completeness (i.e., evaluating whether camera trap sampling reflected the local fauna), species accumulation curves were generated from the dataset of capture locations, times, and animal species obtained. The species accumulation curve was created using R (ver. 4.2.2) and the Began package. To examine whether animal occurrence numbers were influenced by differences in land use, the number of animal detections was compared between the farm and forest areas. For species considered to have a minimum sample size (n = 10), Fisher's exact test was performed, with $p < 0.05$ indicating a statistically significant difference. The null hypothesis was that "the number of detections is not influenced by the detection site," assuming that in this case, the number of

animal detections would be proportional to the ratio of operational days between survey sites. It should be noted that during the period from 2000 to 2024, wild boars, the main terrestrial mammal species on Borneo (Shanahan et al., 2000), were absent due to African swine fever (Erik et al., 2024).

RESULTS

Coffee Farm Development

Mr. F, who was a businessman until his thirties, led a busy life in the city. After his health deteriorated, he quit his corporate job and returned to his hometown, Long Lellang. Once he recovered, he began farming rice and coffee on his own land alongside his father, Mr. Amat Aran. A 2009 report on the coffee farm stated that the purpose of the development was to set a precedent for appropriate land use in the region by introducing coffee, a cash crop (Manit & Sedau, 2009). It would also provide opportunities for the Penan people living in the vicinity to earn monetary income and improve their community's economic situation. Around the farm, within a 30-minute boat ride or walking distance, are the Penan villages of Long Benali, Ba Pengaran Iman, and Ba Pengaran Kelian, each with a population several times larger than that of Long Lellang.

The main coffee varieties cultivated industrially worldwide are Arabica and Robusta. Arabica, the most widely produced variety, is grown in high-altitude, cool climates. Robusta, whose flavor is less prone to change, is frequently used for instant and canned coffee. In the 1880s, British Malayan administrators began cultivating the Robusta variety, but it suffered devastating damage from leaf rust disease and defoliation caused by moth flights (Omar et al., 2022). Liberica is a minor variety, accounting for less than 1% of the global coffee industry, but it is more heat-tolerant than Arabica and resistant to leaf rust. Mr F has focused on cultivating Liberica while also working with Robusta and Arabica varieties.

Initially, the coffee farm began with the cooperation of two Penan families and had expanded to 20 families by November 2009. Wages were RM 15 for youth and RM 20 for adults for the actual work done that day. Tasks included planting seedlings, weeding, pruning, and fertilizing. According to interviews conducted by Manit and Sedau (2009), the Penan welcomed the farm's labor system as clear and understandable, viewing it as a valuable source of income that significantly improved the community's economic situation. The buyer for the farm's coffee beans is an individual operating a cafe in Kuching, the capital of Sarawak. This buyer roasts the beans and sells them as coffee beans.

The total expenses from 2007 to 2009, including wages, equipment purchases, and fuel costs, came to RM 42,000, to the extent that records exist, and were covered entirely by Mr F and his father. Records indicate that in 2008, a total of 7,480 seedlings of Liberica and Robusta were planted across 6.7 hectares of farmland, with harvest expected by mid-2010. Coffee trees are said to bear fruit three to five years after planting, meaning that the trees planted in 2008 were able to produce fruit around 2011.

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TABLE 1.

Class	Order	English name	Scientific name	Number of videos		*P**
				Cofee farm	Forest	
Mammalia	Carnivora	Bornean sun bear	*Helarctos malayanus*	0	6	—
		Banded civet	*Hemigalus derbyanus*	0	4	—
		Binturong	*Arctictis binturong*	0	1	—
		Malay civet	*Viverra tangulunga*	14	16	0.795
		Masked palm civet	*Paguma larvata*	0	2	—
		Domestic cat	*Felis catus*	1	0	—
		Domestic dog	*Canis lupus*	3	0	—
		Yellow-throated marten	*Msrtes flavigula*	2	1	—
		Short-tailed mongoose	*Urva brachyurus*	0	1	—
	Antiodactyla	Sambar deer	*Rusa unicolor*	7	29	0.019
		Red muntjac	*Muntiacus muntjak*	0	23	0.001
		Mouse deer	*Tragulus sp.***	0	4	—
	Primates	Pig-tailed macaque	*Macaca nemestrina*	0	107	< 0.001
		Long-tailed macaque	*Macaca fascicularis*	0	8	—
	Rodentia	Long-tailed porkpine	*Trichys fasciculata*	0	3	—
	Pholidota	Sunda pangolin	*Manis javanica*	5	5	1.000
Aves	Galliformes	Crested fireback	*Lophura ignita*	0	13	0.039
		Great argus	*Argusianus argus*	0	5	—
	Gruiformes	White-breasted waterhen	*Ameurornis phoenicurus*	2	0	—

*Calcurated by Fisher's exact test. The procedure is described in the method section.

** At least include *Tragulus napu*

In 2016, the Malaysian federal government launched a program to encourage coffee cultivation in Long Lellang. This development support began because Mr F's farm was recognized by the government as a successful business model (Bundo, 2025). The government provided RM 3,000 per person to plant Liberica coffee on one hectare of land. This aid led some villagers who had left to return and start cultivation, sparking disputes over land ownership. Additionally, some of those who started farming due to this aid knew nothing about the long, arduous process from cultivation to sale, or had no real interest in it. Indeed, some cleared land, planted seedlings, received the subsidy, and soon abandoned their farms. Administrative officials involved in development assistance conducted inspections but did not provide cultivation guidance or establish sales channels. As a result, almost none of those who started coffee farming using the government assistance continue to do so as of the writing of this article.

At the time of the 2023 survey, Mr F's farm measured approximately 6.7 hectares, maintaining the same size as when it was first developed (Fig. 1E). The quantity of beans sold to roasters was 1,496kg per month, with the purchase price offered by local roasters for high-quality beans being RM 40 per kg. Transportation costs from the village amounted to RM 4, and expenses for processing and bean sorting were about RM 10, leaving RM 25. According to Mr F, this is used to pay workers' wages, meaning his business is operating at a level that does not result in a loss (Bundo, 2025).

The typical way to drink coffee in Malaysia involves adding milk and sugar or consuming it as instant coffee. Consequently, the domestic market in Malaysia was stagnant until recently. In addition to coffee, Mr F's farm therefore also cultivates pineapple (*Ananas comosus*), dragon fruit (*Selenicereus undatus*), and durian (*Durio zibethinus*), practicing coffee agroforestry.

The fruit that grows on the coffee tree is called a coffee cherry, and the coffee bean is the seed inside this fruit. Processing and refining are necessary to remove the pulp from the fruit and extract only the seed, or "bean." The flavor of the bean changes depending on the refining method. Mr F experiments with three methods (Bundo, 2025). One is the "natural" method, where the fruit is dried whole and then the seeds are extracted. The second is the "washed" method, where the pulp is removed before drying. The third is the "honey process," where the seeds are dried while leaving the mucilage around them intact. As of 2024, he also began cultivating new seedlings and experimenting with a processing method involving slow indoor drying. As for the writing of this article, plans are underway to use the coffee pulp and skin to make tea. Mr F has thus shown dedication to producing high-quality beans and improving his cultivation, harvesting, and processing methods.

Mammal and Bird Fauna

Camera traps captured 12,931 videos. Of these, 262 captured images of medium- and large-sized vertebrates, including sixteen mammal species and three terrestrial bird species (Table 1). Nine of these species were listed on the IUCN Red List (IUCN 2024): Bornean sun bear (vulnerable), banded civet (near threatened), binturong (vulnerable), sambar (vulnerable), pig-tailed macaque (endangered), long-tailed macaque (endangered), Sunda pangolin (critically endangered), Bornean crested fireback (vulnerable), and great argus (vulnerable). Bornean sun bears and pig-tailed macaques were photographed with their young (Fig. 2). The breeding of medium-to-large-sized animals, including rare species, was photographed in the secondary forest adjacent to the farm.

The species accumulation curves, which indicated the completeness of sampling, passed an inflection point and were approaching an asymptote in both environments (Appendix 1). Comparing the vertebrates photographed between environments, the forest yielded fourteen mammal species and two bird species, while the farmland yielded fewer species: six mammal species and one bird species (Table 1). The number of photographs per species and the photograph frequency (number of photographs/100 camera-days) are shown in Table 1 and Fig. 3. While the photographs of sambar deer, barking deer, pig-tailed macaques, and great argus were fewer on the farm, some species, such as the Malaysian civet and Sunda pangolin, were photographed relatively frequently. However, since the sensors installed in cameras were easily affected by the surrounding environment, it is also necessary to be cautious in interpreting the shooting frequency. Although the ground is covered with herbs, these are regularly removed by mowing and herbicides, particularly around the base of the coffee trees.

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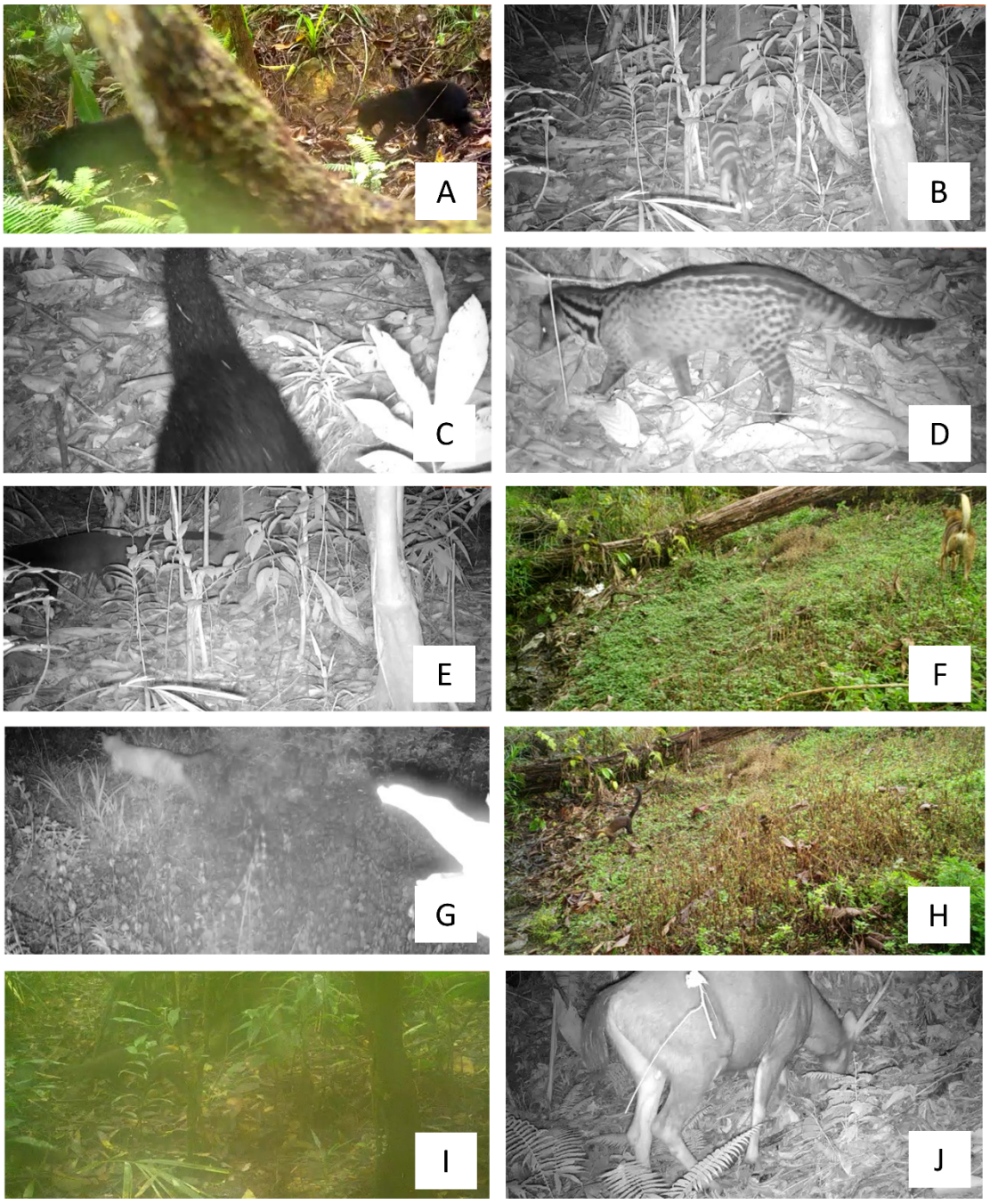

FIGURE 2.

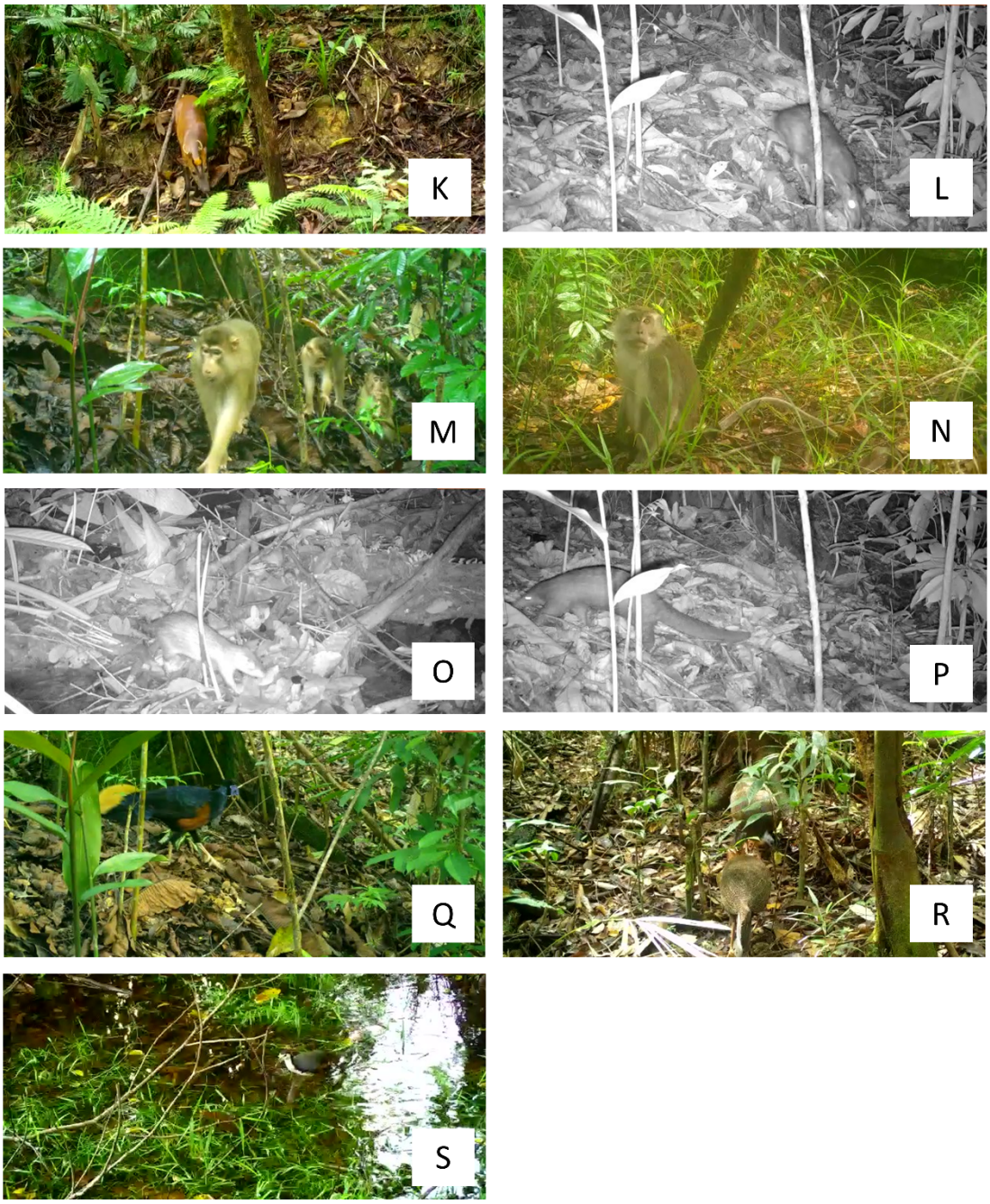

FIGURE 2 (*continued).*

(A)Bornean sun bear, (B) banded civet, (C) binturong, (D) Malay civet, (E) masked palm civet, (F) domestic dog, (G) domestic cat, (H) yellow-throated marten, (I) short-tailed mongoose (not captured in the video), (J) sambar deer, (K) red muntjac, (L) mouse-deer, (M) pig-tailed macaque, (N) long-tailed macaque, (O) long-tailed pork pine, (P) Sunda pangolin, (Q) Bornean crested fireback, (R) great arguments, (S) white-breasted waterhen.

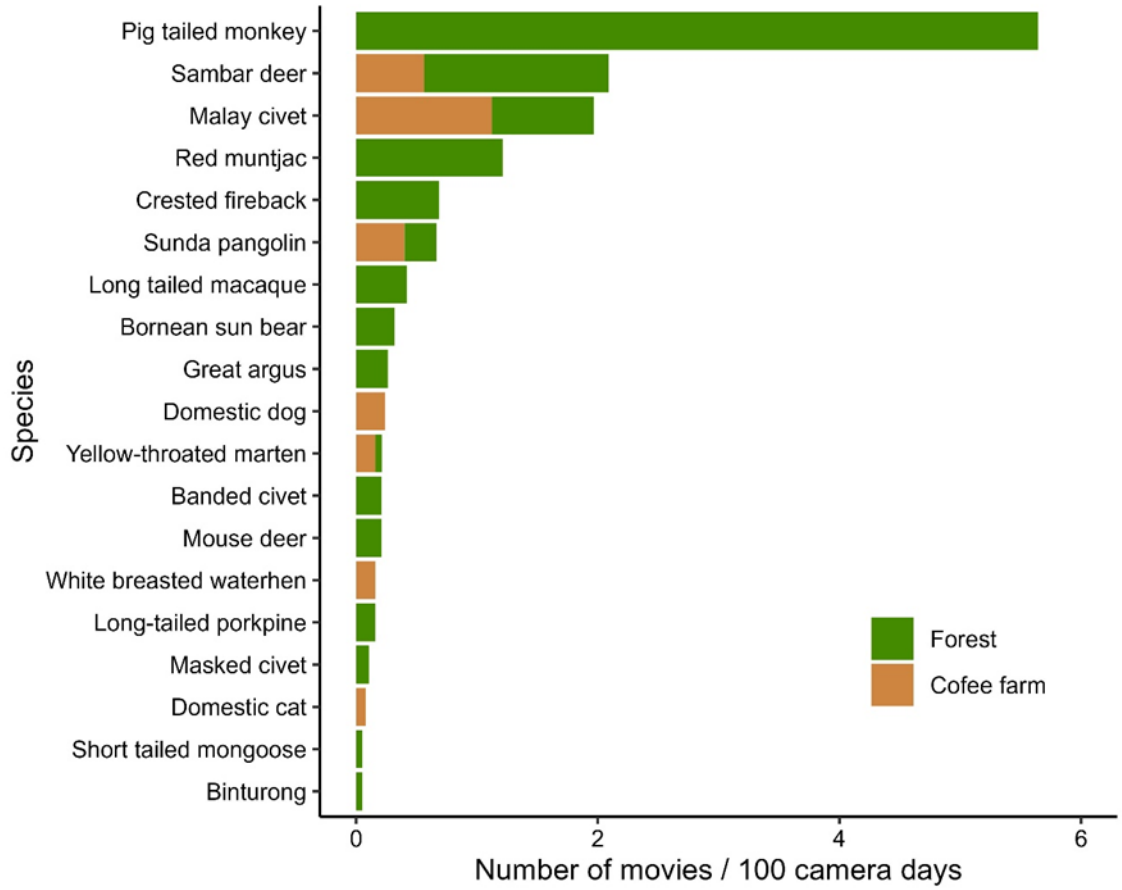

FIGURE 3: Frequency of animal photography

Consequently, despite the presence of adjacent forest, wild vertebrate appearances are infrequent. Nevertheless, animals moving between the secondary forest and coffee farm farms were also confirmed, including Malayan civet, sambar deer, and Sunda pangolin.

The vertical axis shows the cumulative number of animals photographed; the horizontal axis shows the number of cameras installed; the solid line represents the forest; the dashed line represents the value of the coffee farm were confirmed, including Malayan civet, sambar deer, and Sunda pangolin.

DISCUSSION

A small coffee farm was established by a Kelabit family in 2007. The owner, Mr F, has been running the farm for 20 years, maintaining a steady income and a reasonable budget. Surrounding the coffee farm are secondary forests and, beyond them, primary forest areas inhabited by the Penan. The diverse plant and animal resources in the primary forest have formed the basis of the Penan's traditional livelihood. Some non-timber forest products are a source of cash income, but they are becoming difficult to secure as the quality of forests deteriorates (Kanazawa, 2017). Meanwhile, farming communities like the Kelabit must secure alternative income sources, such as cash crop cultivation. Mr F hoped that introducing coffee, a cash crop, would establish a precedent for appropriate land use in the area. At the same time, the coffee farm's management could not be conducted solely within the Kelabit community; it also required labor from the Penan. Developing the coffee farm was therefore an effort to create a local community project in which different ethnic groups could cooperate and coexist.

Conversely, the coffee farm impacted wildlife, as evidenced by the low frequency of herbivore sightings. One reason for this is hunting. According to Mr F, the openness of the farm makes it easy to hunt, and the Penan visit the farm and surrounding forest for these purposes, which are separate from farm management. This may have caused herbivores to become wary and not approach the farm. However, a few sambar deer have been photographed on the farmland (Table 1), and deer species also come to eat the cultivated foliage.

Nevertheless, Mr F's farm has not experienced the type of conflict or damage between wildlife and humans seen on large-scale farms like those of oil palms. While there has been some limited environmental disturbance, it has not led to a decline in wildlife or significant changes to the forest landscape. In the secondary forest adjacent to the farm, medium-to-large animals, including rare species, were photographed breeding. This suggests that, depending on the degree of forest use, forest utilization and wildlife survival can coexist. In locations adjacent to primary or secondary forests, agroforestry land use practices—planting various fruits alongside coffee—can also function as wildlife buffer zones and biological corridors.

Malaysia's coffee culture is currently undergoing a transformation, with demand increasing, especially among young people. Going forward, if the Liberica variety cultivated at Mr F's farm gains higher recognition and its purchase price increases, his business will become more stable. In recent years, Long Lellang has organized agricultural experiences for tourists, which are expected to contribute to revitalizing the local economy as part of the tourism industry. Tourists are already coming to the village for trekking and ecotourism, and visitors have also begun seeking out the coffee farm. The sustainable development of coffee farms within UBFA thus represents an opportunity to balance biodiversity conservation with the autonomous survival of the local community, and it is crucial to further improve these capabilities.

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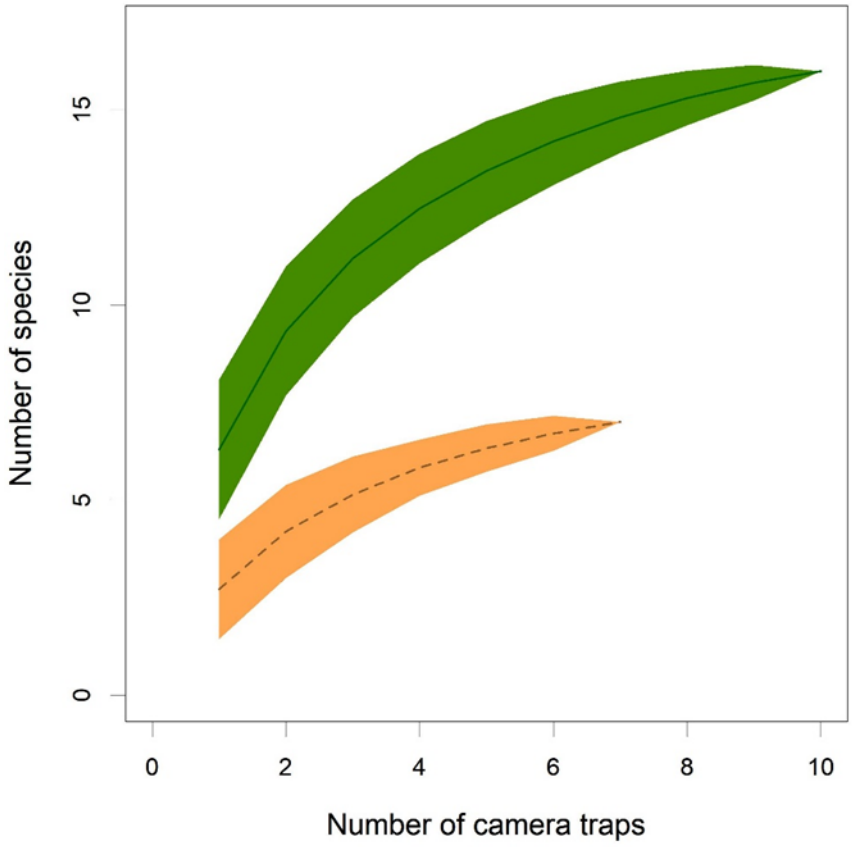
APPENDIX



APPENDIX 1: Completeness of sampling by camera traps

The vertical axis shows the cumulative number of animals photographed; the horizontal axis shows the number of cameras installed; the solid line represents the forest; the dashed line represents the value of the coffee farm; the bands indicate the 95% confidence interval.

Journal of Borneo – Kalimantan

Paradiplomacy at the Sarawak–Kalimantan Border through SOSEK-MALINDO

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ABSTRACT

This article examines Sarawak's participation in the SOSEK-MALINDO (Kerjasama Sosial Ekonomi Malaysia-Indonesia) framework as an example of subnational involvement in cross-border governance. While foreign affairs and border security remain under federal jurisdiction in Malaysia, Sarawak has engaged actively in SOSEK-MALINDO through collaboration with Kalimantan at both the state-province and technical levels. Drawing on qualitative data from in-depth interviews with key state and federal officials, the study investigates Sarawak's external engagement within a federally institutional framework. The findings indicate that SOSEK-MALINDO functions as a multi-level and multi-sectoral governance platform, enabling subnational participation while maintaining federal authority. At the state-province level, Sarawak contributes to agenda-setting and coordination on border development and socio-economic priorities. At the technical level, Sarawak's involvement centers on implementation-oriented collaboration among various ministries and departments. This study argues that Sarawak's involvement in SOSEK-MALINDO is better understood as paradiplomacy grounded in strategic complementarity rather than driven by subnational assertiveness. It further contributes to the paradiplomacy literature by illustrating how subnational external engagement can occur within centralized, asymmetrical federations through practical cooperation.

Keywords: Paradiplomacy; SOSEK-MALINDO, Sarawak, Malaysia-Indonesia relations, Border governance

INTRODUCTION

The Sarawak-Kalimantan border is one of the most complex land frontiers in Southeast Asia. It stretches across mountainous terrain, dense forests, and remote rural settlements. Governing this border presents persistent challenges, particularly in relation to security, mobility, and socio-economic development (Brunet-Jailly, 2005; Horstmann, 2016). Although border control and foreign affairs fall under federal jurisdiction in Malaysia, the practical management of this frontier depends heavily on local and state-level involvement (Hutchinson, 2014). In East Malaysia, the significant geographical distance from the federal centre has shaped governance patterns. Malaysia's centralized federal system places key decisions on security and external relations at the national level. However, federal agencies operating along the Sarawak–Kalimantan border encounter practical challenges related to terrain, accessibility, and local expertise (Hutchinson, 2014). Within this context, the Sarawak state government plays a critical operational role by providing infrastructure, logistical support, and coordination that facilitate federal agencies' on-the-ground responsibilities. These practices illustrate governance arrangements influenced by administrative capacity and territorial proximity, rather than by formal jurisdiction alone (Ziblatt, 2004).

Sarawak's involvement in cross-border governance has become increasingly significant in recent years. Interactions between Sarawak and Kalimantan are routine and deeply embedded in the daily lives of border communities. These communities share longstanding kinship ties, economic activities, and social practices that predate the formal establishment of the international boundary (Horstmann, 2016). Furthermore, Indonesia's decision to relocate its national capital to Nusantara in East Kalimantan is anticipated to intensify mobility, connectivity, and economic exchange throughout Borneo. Such developments impose new demands on existing governance arrangements and underscore the necessity for sustained cross-border cooperation (Yeoh, 2024).

One of the key institutional platforms for Malaysia-Indonesia cooperation in border regions is the SOSEK-MALINDO framework. Established to address social and economic issues along the border, SOSEK-MALINDO operates through several levels, including federal, state, provincial, and technical committees. While federal authorities lead government-to-government relations, subnational actors play a significant role at the operational level, particularly in addressing issues that directly affect border communities (Keating, 1999; Cornago, 2010). In the Malaysian context, Sarawak is deeply involved at the state-province and technical levels, where many practical aspects of cross-border cooperation are discussed and implemented. Despite this active involvement, Sarawak's role has received limited scholarly attention. Much of the existing literature on Malaysia-Indonesia relations focuses on national diplomacy, security concerns, or federal-level institutional arrangements (Loh, 2010; Yeoh, 2020). Less attention has been given to how subnational actors contribute to cross-border governance in practice, particularly within a centralised federal system such as Malaysia's. This gap is significant, as it overlooks the everyday cooperation and institutional arrangements that sustain border stability in Borneo.

This article addresses this gap by analyzing Sarawak's role as a subnational actor in cross-border governance through the SOSEK-MALINDO framework. It examines the mechanisms of Sarawak's participation in cross-border cooperation, the internal and external roles it assumes, and the influence of paradiplomacy and federal–state relations on these roles. Drawing on qualitative data from in-depth interviews, fieldwork in selected Sarawak-Kalimantan border communities, and documentary analysis, the article argues that Sarawak's involvement constitutes a pragmatic and functional form of paradiplomacy. This engagement complements federal authority and enhances the effectiveness of Malaysia-Indonesia cooperation in Borneo.

METHOD AND APPROACHES

This study employs a qualitative research approach to investigate Sarawak's role in cross-border governance through the SOSEK-MALINDO framework. A qualitative design is appropriate for exploring institutional roles, coordination processes, and governance practices within a formal bilateral mechanism, aspects that are not readily captured by quantitative methods (Creswell, 2013). The research is structured as a case study of SOSEK-MALINDO in the context of the Sarawak-Kalimantan border. Case study methodology is well-suited for analyzing contemporary governance arrangements within their real-life institutional settings, especially where policy, practice, and administrative context are closely interrelated (Yin, 2018). SOSEK-MALINDO serves as a pertinent analytical focus, representing a long-standing institutional platform for Malaysia-Indonesia border cooperation, with Sarawak actively engaged at operational and coordination levels.

Data collection was conducted through three primary methods: semi-structured interviews, field engagement in selected border areas, and documentary analysis. Semi-structured interviews were carried out with officials directly involved in border governance and SOSEK-MALINDO coordination. These interviews focused on institutional roles, coordination mechanisms, and Sarawak's involvement in facilitating cross-border cooperation. The semi-structured format allowed informants to elaborate on their operational experiences while ensuring consistency across interviews. All informants were anonymized due to the institutional sensitivity of border governance. Informants coded as A1 and A2 refer to senior state-level officials from Sarawak involved in border governance and cross-border coordination. These informants provided insights into Sarawak's policy orientation, administrative roles, and engagement within the SOSEK-MALINDO framework. Informants A3 and A4 represent federal-level officials involved in SOSEK-MALINDO coordination and border security management. Their perspectives were used to contextualize federal-state interactions and operational dynamics at the border. Additional insights from federal enforcement agencies were used to enhance understanding of border operations and coordination practices.

Field engagement was conducted at selected locations along the Sarawak-Kalimantan border to provide contextual grounding for the institutional data. Observations focused on physical infrastructure, accessibility, and the operational environment in which cross-border governance takes place. This engagement helped situate SOSEK-MALINDO discussions within the practical realities of border management. Documentary analysis constituted the third data source. Official documents related to SOSEK-MALINDO, including policy papers, meeting records, and relevant government reports, were examined to understand the framework's structure, objectives, and operational processes. These documents were used to triangulate interview findings and field observations, thereby strengthening the analysis's credibility.

The data were analyzed using a thematic approach. Interview transcripts, field notes, and official reports were systematically coded to identify recurring themes related to Sarawak's roles, coordination dynamics, and institutional interactions within SOSEK-MALINDO. Particular attention was given to how subnational agencies and federal-state relations intersect to shape Sarawak's participation in cross-border governance. Ethical considerations were addressed throughout the research process. Given the sensitivity of border governance and security-related issues, confidentiality and anonymity were strictly maintained. Informed consent was obtained prior to all interviews, and all data were handled in accordance with established qualitative research ethics.

SCOPE AND LIMITATION

This study examines Sarawak's involvement in cross-border governance through the SOSEK-MALINDO framework along the Sarawak-Kalimantan border. The analysis is limited to institutional roles, coordination

mechanisms, and governance practices at the state and federal levels in Malaysia, with particular emphasis on Sarawak's participation as a subnational actor within a centralized federal system. The study's qualitative, case-specific design limits its generalizability. Findings are based on a targeted set of institutional informants and documentary sources related to SOSEK-MALINDO and border governance in Sarawak. Consequently, the analysis does not seek to generalize to all Malaysian states or border regions, nor does it offer a comprehensive assessment of community-level impacts. Rather, it provides a focused examination of Sarawak's role within a specific border governance context.

FINDINGS AND DISCUSSION

SOSEK-MALINDO as a Multi-Level Cross-Border Governance Framework

An understanding of Sarawak's roles in cross-border governance requires first an examination of the SOSEK-MALINDO framework itself. SOSEK-MALINDO was established as a bilateral cooperation mechanism between Malaysia and Indonesia to address socio-economic and development-related challenges along their shared border. In his early assessment of Malaysia–Indonesia border cooperation, Saru Arifin (2012) explains that SOSEK-MALINDO was conceived as a platform to complement traditional diplomatic arrangements by focusing on development and welfare issues in peripheral border regions.

Rather than operating solely through national-level diplomacy, SOSEK-MALINDO was designed to accommodate interaction across different administrative levels. This design reflects a broader governance pattern in which policy coordination involves multiple tiers of authority. In conceptual terms, this resembles what Marks (1993) describes as multi-level governance, where decision-making is dispersed across interconnected levels rather than concentrated at the centre. Importantly, this conceptual lens is used here to frame the operational structure of SOSEK-MALINDO, not to suggest that the framework itself was explicitly designed as a formal MLG model.

SOSEK-MALINDO operates through three interrelated levels. At the government-to-government (G-to-G) level, federal authorities from Malaysia and Indonesia establish overarching policy directions and bilateral priorities. As noted by Saru Arifin (2012), this level reflects formal diplomatic relations and provides the political foundation for cooperation undertaken at lower levels. At the state–province level, subnational governments such as Sarawak and Kalimantan Barat (Kalbar), Sabah and Kalimantan Timur (Kaltim), Johor and Riau, participate in discussions related to border development, infrastructure connectivity, and socio-economic coordination. More recent work by Yagoza and Maksum (2024) shows that subnational actors increasingly use SOSEK-MALINDO as a space to address practical cross-border issues that require local knowledge and administrative proximity. Informants A1 and A2 in this study similarly emphasised that this level allows Sarawak to raise concerns grounded in border realities and operational constraints, even though decision-making authority remains limited.

The technical level focuses on implementation and coordination among relevant agencies. As Sudiar (2019) points out in his analysis of SOSEK-MALINDO-related cooperation, the effectiveness of technical coordination is often shaped by institutional compliance requirements and jurisdictional boundaries. This observation is consistent with this study's findings, which show that while technical committees play an important role in operational coordination, their capacity remains dependent on federal approval and administrative hierarchies.

Across these three levels, cooperation under SOSEK-MALINDO is further organised into three functional fields**.** These include social and cultural cooperation, economic and trade connectivity, and safety and border management. The social and cultural field covers areas such as education, health, and community welfare. The economic and trade field focuses on agriculture, investment, tourism,

transportation, and cross-border economic activity. The safety and border management field addresses border infrastructure, control, and coordination to ensure that socio-economic cooperation does not undermine national security. This tripartite organisation is consistently applied across the SOSEK-MALINDO frameworks in both Peninsular Malaysia and East Malaysia, including Sarawak.

In sum, the integration of multi-level coordination and functional differentiation establishes SOSEK-MALINDO as a structured cross-border governance mechanism rather than merely a diplomatic forum. The framework institutionalizes subnational participation while maintaining federal authority. This institutional design is significant as it provides a legitimate and clearly defined platform for analyzing Sarawak's paradiplomacy engagement.

Sarawak's Paradiplomacy through the SOSEK-MALINDO Framework

In this study, paradiplomacy refers to subnational participation in cross-border governance within a framework accepted by the federal state. This understanding follows Duchacek's (1984) early conceptualisation and later refinements by Lecours (2008) and Kuznetsov (2015). Paradiplomacy, in this sense, does not imply an erosion of state sovereignty. Instead, it reflects the growing involvement of subnational governments in addressing external issues that directly affect their territories. The findings indicate that Sarawak's engagement in SOSEK-MALINDO constitutes a clear example of such paradiplomacy. Although foreign affairs and border security remain under federal jurisdiction in Malaysia, Sarawak participates actively in cross-border governance through an institutional framework endorsed by the central government. This arrangement allows the state to engage externally while remaining consistent with national authority. Sarawak's involvement, therefore, demonstrates how subnational governments can act beyond their borders without challenging the constitutional order.

This pattern of engagement aligns closely with Lecours' (2008) argument that paradiplomacy is often driven by territorial needs rather than political ambition. Border regions face distinct challenges. These challenges include security concerns, economic interdependence, and frequent cross-border interactions. In Sarawak, such issues are deeply embedded in everyday governance along the Sarawak-Kalimantan border. Centralised decision-making alone is insufficient to manage these dynamics effectively. As a result, subnational participation becomes both necessary and rational. Kuznetsov (2015) distinguishes between confrontational and cooperative forms of paradiplomacy. Cooperative paradiplomacy occurs when subnational governments engage externally with the consent or tolerance of the federal state. The aim is to improve governance outcomes rather than to seek political recognition. Sarawak's participation in SOSEK-MALINDO reflects this cooperative model. Informants A1 and A2 repeatedly emphasised that the state does not pursue an independent foreign policy role. Instead, Sarawak engages through recognised institutional channels that allow local concerns to be communicated and addressed.

The findings further support Cornago's view of paradiplomacy as a governance practice shaped by functional needs. Cornago argues that subnational external engagement often emerges in response to concrete policy problems. This is especially evident in border regions, where social, economic, and security issues intersect. In Sarawak's case, SOSEK-MALINDO provides a structured platform for managing shared border challenges with Kalimantan. The framework enables regular interaction without displacing federal control over foreign relations. Sarawak's paradiplomacy through SOSEK-MALINDO is also characterised by its practical orientation. Informant A1 described Sarawak's role as involving sustained participation, agenda contribution, and coordination through SOSEK-MALINDO's established working channels. These interactions focus on implementation and problem-solving. They are not framed as formal diplomatic negotiations. This reflects what Rodrigues and Mattioli (2017) describe as problem-oriented paradiplomacy, in which subnational actors focus on addressing specific governance challenges rather than advancing political claims.

The broader Southeast Asian context reinforces this interpretation. Research on paradiplomacy in Asia shows that subnational external engagement often operates within a strong central authority. Utomo (2022) demonstrates that Indonesian subnational governments engage externally primarily through frameworks approved by the central state. Such engagements are usually linked to development and border management. Similarly, Syuryansyah (2024) observes that paradiplomacy in Southeast Asia tends to be instrumental in nature. It is driven by governance needs rather than identity-based or autonomy-seeking agendas. Sarawak's experience within SOSEK-MALINDO reflects these regional patterns.

Collectively, the findings indicate that Sarawak's paradiplomacy is embedded, cooperative, and driven by functional considerations. Rather than challenging Malaysia's federal authority, it complements national border governance by integrating local knowledge and sustained subnational engagement. Bello-Gómez (2024) contends that such forms of paradiplomacy are increasingly prevalent within multi-level governance arrangements, where subnational action strengthens rather than weakens state capacity.

This case, therefore, contributes to the literature on paradiplomacy in centralised and asymmetrical federations. Sarawak demonstrates that meaningful subnational external engagement does not require extensive constitutional autonomy. What it requires is institutional space. SOSEK-MALINDO provides that space. Through this framework, Sarawak operates as a strategic partner in cross-border governance rather than as a competing diplomatic actor. The following subsections examine this engagement more closely by separating Sarawak's paradiplomacy at the state-province level from its technical engagement**.**

Paradiplomacy at the State-Province Level

At the state-province level, Sarawak's paradiplomacy under the SOSEK-MALINDO framework takes on a more strategic character. Informant A3 explained that this level functions as a coordination space where Sarawak engages directly with Kalimantan authorities on development priorities along the border. The emphasis is not on operational execution. Instead, discussions focus on planning, interest alignment, and identifying projects that require cross-border coordination.

One key area of engagement involves border infrastructure and connectivity**.** Informant A4 noted that projects such as the upgrading of the Tebedu–Entikong CIQS (Customs, Immigration, Quarantine and Security) are frequently discussed at the state-province level. These discussions do not replace federal decision-making. Instead, they allow Sarawak and Kalimantan to articulate local development needs and logistical constraints before implementation. This process helps ensure that large-scale infrastructure projects reflect the realities of borders on both sides. Another recurring issue raised by informant A4 concerns cross-border road connectivity, particularly routes linking Ba'Kelalan in Sarawak with Long Bawan in Kalimantan. At the state-province level, engagement focuses on aligning development priorities and addressing coordination challenges. Informants described this engagement as necessary because road connectivity affects mobility, access to services, and economic activity in remote border areas. Although construction and enforcement remain under federal authority, state-provincial coordination helps reduce policy mismatches and implementation delays.

Informant A3 also highlighted discussions on the development of small-scale cross-border trade, including planning for facilities such as the Jagoi Babang small-scale trade processing centre. At this level, Sarawak's role is not to manage trade operations. Instead, it involves coordinating development objectives, identifying potential economic benefits, and ensuring that facilities align with the needs of border communities. This illustrates how paradiplomacy at the state–province level focuses on shaping the policy environment rather than administering day-to-day activities. Importantly, these engagements occur within clear institutional boundaries. Security enforcement and border control remain firmly under federal jurisdiction. Informants repeatedly emphasised this distinction. The separation of roles reflects the broader Malaysia-Indonesia border governance architecture, which remains highly centralised and security-driven.

Studies on Malaysia-Indonesia border cooperation, particularly those analysing GBC-MALINDO, show that military and security agencies dominate decision-making in enforcement-related matters. This context helps explain why Sarawak's paradiplomacy at the state–province level concentrates on development and coordination rather than security operations.

From a theoretical perspective, this pattern is consistent with cooperative paradiplomacy as described by Kuznetsov (2015). Sarawak's engagement does not seek to bypass federal authority. Instead, it operates within a recognised framework to enhance governance outcomes. Lecours (2008) similarly notes that subnational governments often use external engagement to address territorially specific issues that central governments may not prioritise. Sarawak's state–province engagement reflects this logic. Comparatively, similar practices can be observed in other federated and decentralised systems. In Germany, for example, Länder such as Bavaria engage in cross-border coordination on infrastructure and regional development while security remains a federal responsibility. As Gunlicks (2003) observes, such engagement is generally supported when it improves policy effectiveness without challenging constitutional authority. Sarawak's paradiplomacy under SOSEK-MALINDO follows a comparable pattern. It remains institutionally bounded, yet strategically meaningful.

Overall, the findings demonstrate that paradiplomacy at the state–province level enables Sarawak to play a substantive role in shaping cross-border development outcomes. Through SOSEK-MALINDO, Sarawak contributes to agenda-setting, coordination, and the alignment of priorities with Kalimantan counterparts. This engagement strengthens cross-border governance while maintaining Malaysia's centralized control over foreign affairs and security.

Paradiplomacy at the Technical Level

The technical level of SOSEK-MALINDO provides a key avenue for Sarawak's paradiplomacy engagement. Informant A4 emphasized that many practical border issues are resolved not through high-level political discussion, but through sustained technical coordination. At this level, Sarawak provides administrative input, operational insights, and contextual knowledge that shape the implementation of agreed initiatives. This type of engagement aligns with Halberstam's (2012) argument that subnational actors often play a decisive role in policy implementation even when formal authority remains centralized.

Technical coordination under SOSEK-MALINDO involves agencies from multiple federal ministries with operational responsibilities related to the border. For example, discussions often involve the Ministry of Home Affairs on matters such as border access procedures, movement facilitation, and alignment of administrative practices. These meetings ensure that policies agreed at higher levels can be applied effectively at border crossings. Similarly, technical coordination may involve the Ministry of Tourism, Arts and Culture in planning activities that support cross-border people-to-people interactions, particularly where tourism and community engagement intersect with market and mobility considerations.

A concrete example of technical paradiplomacy is *Pasar Serikin*, one of the busiest informal cross-border markets between Sarawak and Kalimantan. Informant A3 noted that coordination for the market's continued operation involves agencies under the Ministry of Home Affairs to ensure regulatory compliance and safe movement. In addition, planning for a new ICQS facility at Serikin reflects inter-agency technical involvement. According to industry and government reports (Seng, 2024), the construction of an RM50 million ICQS complex is projected to begin as part of efforts to standardise border procedures and facilitate legitimate trade and travel across the Sarawak-Kalimantan border. This example illustrates how technical paradiplomacy translates cross-border understanding into concrete institutional mechanisms that affect everyday governance. Technical engagement also extends to coordination around Standard Operating Procedures (SOPs)for specific administrative actions. For instance, as mentioned by informant A3, Sarawak and West Kalimantan agreed technical SOPs for the repatriation of human remains during the 40th SOSEK-

MALINDO working committee meeting. This demonstrates how routine technical matters become zones of sustained cross-government interaction.

Informant A3 further noted that agencies involved in agriculture and agro-based industries are engaged in discussions that affect cross-border economic activity. While these engagements do not override national economic policy, they support the practical functioning of cross-border markets and supply chains. This aligns with Martínez-Vázquez et al.'s (2024) observation that subnational actors frequently act as implementers and facilitators in multi-level governance systems. At the technical level, Sarawak's proximity to the border provides it with contextual expertise that informs how policy is applied locally. Informant A4 described how Sarawak's technical contributions help overcome practical constraints that would otherwise hinder the implementation of cross-border initiatives. This supports the view that paradiplomacy can emerge not only through external dialogue but also through daily administrative interaction that bridges federal policy and local realities.

Nevertheless, technical paradiplomacy under SOSEK-MALINDO is constrained by clear institutional boundaries. As Sudiar (2019) notes, and as informants confirm, the effectiveness of technical coordination is limited by compliance requirements and federal authority. Final decision-making authority resides with central ministries. This underscores that Sarawak's role at the technical level is cooperative and facilitative, rather than autonomous. Overall, the findings suggest that paradiplomacy at the technical level is incremental, routine, and focused on implementation. It is characterised by inter-agency coordination across multiple ministries and sectors, translating higher-level agreements into practical measures. This form of paradiplomacy sustains cross-border cooperation by ensuring the effective functioning of institutional arrangements.

Paradiplomacy as Strategic Complementarity in Centralised Federations

Collectively, the findings indicate that Sarawak's paradiplomacy through SOSEK-MALINDO is best characterized as strategic complementarity rather than subnational assertiveness. Sarawak does not pursue an independent foreign policy agenda or seek to circumvent federal authority. Instead, its engagement enhances Malaysia's capacity for cross-border governance by contributing local knowledge, administrative expertise, and sustained participation within a bilateral framework. This approach reflects a pragmatic orientation toward paradiplomacy, driven by functional needs at the border rather than aspirations for autonomy. Through SOSEK-MALINDO, Sarawak operates within institutional boundaries to address issues requiring proximity, local familiarity, and ongoing coordination. In this context, paradiplomacy functions as a governance practice rather than a political strategy.

This interpretation is consistent with comparative scholarship on subnational governance. Avellaneda and Bello-Gómez (2024) argue that subnational governments often enhance national governance outcomes by filling gaps between policy formulation and implementation. Similarly, Martínez-Vázquez et al. (2024) show that subnational involvement is frequently shaped by functional necessity rather than constitutional empowerment. Sarawak's experience aligns with these observations. Its paradiplomatic engagement responds to practical governance demands along the Sarawak–Kalimantan border. Notably, the Sarawak case challenges common assumptions in the paradiplomacy literature. Much existing research focuses on highly autonomous regions or federated systems where subnational governments possess strong constitutional authority. In contrast, Sarawak operates within a centralised and asymmetrical federal system. Despite these constraints, the findings demonstrate that meaningful paradiplomacy can still occur when institutional frameworks provide space for subnational participation. SOSEK-MALINDO serves this function precisely.

Sarawak's engagement also highlights the role of trust and cooperation in federal-state relations. Rather than generating tension or competition, paradiplomacy in this case reinforces collaboration between

levels of government. By remaining aligned with federal priorities while contributing local expertise, Sarawak positions itself as a strategic partner in border governance. This supports a more comprehensive understanding of paradiplomacy as a complementary process that can strengthen, rather than undermine, national authority. Overall, this study contributes to the broader debate on paradiplomacy in centralised federations by demonstrating that subnational external engagement does not necessarily signal fragmentation or contestation. Instead, Sarawak's experience shows how paradiplomacy can function as an embedded and cooperative practice, shaped by institutional design, functional necessity, and pragmatic federal–state relations.

CONCLUSION

This study demonstrates that Sarawak's engagement in SOSEK-MALINDO constitutes a form of paradiplomacy that is both institutionally bounded and strategically significant. Rather than challenging federal authority, Sarawak's participation exemplifies how subnational governments can serve as effective partners within a centralized system of border governance. Through sustained involvement in a bilateral framework, Sarawak facilitates cross-border coordination in ways that centralized mechanisms alone may not achieve. The article's primary contribution is to reframe paradiplomacy as strategic complementarity**.** Sarawak's experience shows that subnational external engagement can arise from functional necessity, administrative capacity, and proximity to border realities, rather than from constitutional autonomy or political assertiveness. In this context, Sarawak's role through SOSEK-MALINDO is notable not for circumventing federal constraints, but for operating productively within them. By analyzing SOSEK-MALINDO as a multi-level and multi-sectoral governance platform, the study highlights the importance of institutional design in enabling subnational participation. The framework offers structured opportunities for engagement at the state–province and technical levels, allowing local knowledge to inform cross-border governance while maintaining federal control over foreign affairs and security. This finding enriches the understanding of paradiplomacy in centralized and asymmetrical federations. More broadly, the Sarawak case challenges the prevailing focus in the paradiplomacy literature on highly autonomous regions or decentralized federal systems. It demonstrates that meaningful subnational engagement is possible even where formal authority is limited, provided that trust, cooperation, and institutional mechanisms are present. In this regard, Sarawak's experience serves as a valuable reference for understanding subnational roles in border governance across Southeast Asia and beyond.

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Ethnography of *Irup (Jamu)*: Medicinal Disclosure of the Traditional Malay's Midwifery Practices in Sarawak

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ABSTRACT

The Malay Archipelago has long practised the use of herbs and/or organic plants to make herbal decoction drinks (jamu) for medicinal purposes. However, the practice of ingesting herbal decoctions has been gradually eroding due to the surge of modernisation and simplicity, as well as the decline in the number of practitioners of traditional medicine. In particular, the consumption of herbal concoctions (referred to locally as irup) by women in confinement after childbirth, which is a practice of traditional midwifery among Malays in Sarawak. This indigenous wisdom is increasingly dwindling and experiencing diaspora issues due to a lack of written records or pertinent reference materials and the ingredients of the sorts of herbs and plants mixture used in the making of irup being typically not shared openly. Thus, using ethnographic inquiry methods, a qualified traditional midwife in Kuching, Sarawak, discloses the specifics of the herbs and plant mixture used to make the irup. The findings discussed in this paper are crucial because they convey society's contemporary perception of the traditional herbs found in the making of irup, especially its potential to prevent or lessen the risk of postpartum depression and the blues. It is important to preserve social aspects of traditional practices for the benefit of future generations, as well as to help shape the Malay community's constantly disappearing cultural identity and indigenous medical knowledge, especially among Malays in Sarawak.

Keywords: indigenous knowledge literacy; traditional midwifery; local wisdom; ethnography; UNESCO SDG 11

INTRODUCTION

A woman's physical, mental, and emotional well-being is disturbed throughout pregnancy and childbirth. Traditional postpartum medical care and healthcare encompass the stages of pregnancy, childbirth, and the postpartum period. Due to restricted mobility and taboos or limits on the types and quantities of food and drink consumption, the postpartum time is thought to be an emotionally, psychologically, and spiritually challenging period. The severe strain is particularly felt by women who are giving birth for the first time and need mutual support and assistance, especially from family members, to get used to the new life with a new member of the family. A woman's rational thinking is altered by postpartum psychological stress because of health issues, changes, and different lifestyles experienced during pregnancy and childbirth (Haron and Hamiz, 2014).

In Malaysia's healthcare system, a woman is responsible for reporting her child's birth to the nearest government health facility (polyclinic). Follow-up examinations for the mother and her newborn baby, as well as scheduled home visits by nurses, will be organised to ensure that both (the mother and newborn baby) receive the medical care they require. In the interim period, skilled, qualified, and experienced medical professionals are needed to attend to the mother's and newborn baby's daily care needs at home. The burden felt by the woman was affected by the insufficient number of skilled medical professionals or traditional midwives, as well as the absence of assistance, information, and abilities for a mother to manage herself, the newborn child, and the home. In certain areas of Sarawak, postnatal care services for mothers and babies by qualified medical practitioners can cost up to RM10,000.00 for the entire postpartum confinement period (40 or 44 days) (Rozaimie, 2024; Rozaimie, Tom and Jalil, 2023). As a result, a woman, especially a "young mother", greatly depends on the help of her biological mother or mother-in-law, who acts as a midwife for postpartum care. Couples confront a financial strain because of this circumstance, particularly young couples or those who are working and living far away from their family members due to the employment obligations. Such psychological and financial constraints compel “young mothers” to take only the hospital-provided substances (typically folic acid and painkillers like paracetamol) and to practise the least amount of self-care.

Postpartum depression, also referred to as postnatal depression (emotional stress) or postpartum psychosis (a serious mental disorder that causes a person to be in a state of delusion, hallucination, or irrational behaviour), is caused by psychological and environmental pressures that a new childbirth mother must deal with (Razali, 2016). These psychological issues have been referred to as "*meroyan*" disorders or diseases in traditional Malay obstetrics. Women who suffer from "*meroyan*" symptoms include those who are prone to easily catching colds and have a persistent fever, chills, shivering, stiff hands, fingers, or legs, headaches, or fainting. Traditionally, the "*meroyan*" condition was thought to be triggered by specific meals (taught as cold in nature), the weather, or even the sound of a wailing infant. Scholars (Barriyyah, 2016; Haron and Hamiz, 2014) contended that women who are under stress may exhibit unexpected behaviours, such as losing patience, being extremely sensitive, becoming furious, sobbing or yelling without apparent cause, experiencing excessive anxiety, sleeplessness or hypersomnia, or worrying about hurting the unborn child.

A scientific study (ref. Haron and Hamiz, 2014) has shown that pregnancy, childbirth, and the postpartum period constitute hormonal instability and alterations in a woman's body. Therefore, among the main therapies and factors practised in traditional postpartum care and treatment to cope with postpartum circumstances are consuming adequate nutrition, breastfeeding, physical care, and avoiding isolation. According to a study by Withers, Kharazmi, and Lim (2018), traditional beliefs and traditions practised mostly among Asian women during the pregnancy, childbirth, and postpartum periods prove helpful in avoiding psychological stress problems. However, due to socio-ecocultural variances (Rozaimie, 2018), different procedural practices exist throughout the archipelago's diverse cultural populations. Previous research (see Rozaimie, Bolhassan and Johari, 2022) identified six traditional postpartum care and treatment

processes based on the Malay community's traditions in Sarawak, including healing, cleansing, heating and toning, energising, and gastronomy. Various herbs and plants are utilised in traditional care, with the primary goal of restoring a woman's energy and blood circulation following pregnancy and childbirth. Traditional postpartum care for women comprises not only physical treatment but also the consumption of herbal and organic plant-based foods and beverages. Hence, this paper focuses on the unfolding of a mixture of ground herbs locally known as *irup* (a kind of *jamu,* or herbal medicine, that is commonly consumed among communities in the Nusantara archipelagos), particularly among the Malay people in Sarawak.

LITERATURE REVIEW

Indigenous knowledge and local wisdom are interchangeable terms that refer to the knowledge and practices within indigenous traditions that are practised and applied in the cultural society, which illustrate the identity and way of life of the local community. Indigenous knowledge provides an overview of the values, value assessment, and ethics that have evolved throughout time, as well as how particular cultures historically viewed environment and existence. The integrated outcomes of observation, innovation, practices, and beliefs that demonstrate the sustainability of life (Rozaimie, 2024; Rozaimie *et al.*, 2023) as well as the ethical management of natural and cultural resources obtained through human-environment interaction (James-Williamson *et al.*, 2024; Bruchac, 2014) are all included in indigenous knowledge, also referred to as traditional wisdom or traditional ecological understanding. Indigenous knowledge is transmitted and descended through social gatherings, oral traditions, particular ceremonies or practices, storytelling, and other means, either formally or informally, among family members and the local community. Indigenous theory is defined by Kim and Berry (1993) as "*a theory of human behaviour or mind that is specific to a context or culture, not imported from another context/culture, and designed specifically for the people living in that context or culture*." However, an operational definition of indigenous communities differs depending on the academic goals, teaching mission, and physical region. The preservation of different social-cultural norms and institutions constitutes one of the fundamental components of accepting indigenous identity (Peredo et al., 2004; Kim *et al.*, 2000; Kim and Berry, 1993). Thus, indigenous communities are identified through "*descendants of the population that inhabited an area before later inhabitants and dominate the geography, politics, and/or economy by later inhabitants or immigrants*" (Peredo *et al.*, 2004, pp. 5). The material culture or extant cultural aspects of the specific indigenous populations give a place a distinct identity that draws tourists to a given village, state, country, region, or location. However, when population migration, intercultural marriages, or the consequences of colonisation cause the ancestral indigenous knowledge to deteriorate far from its original source, it is referred to as extinction or cultural diaspora (Safran, 1991). Since they are deemed unnecessary in contemporary society or do not adhere to the application of constitutional legislation, most of the indigenous knowledge and wisdom have vanished.

Meanwhile, the Sustainable Development Goals (SDGs) are an agenda for sustainable development that aims to make cities and human settlements inclusive, safe, resilient, and sustainable. SDG goal 11(4) explicitly states the protection of the world's cultural and natural heritage (UNESCO, 2001). The SDGs were outlined by the United Nations Educational, Scientific, and Cultural Organisation (UNESCO). Furthermore, the UNESCO Proclamation of Masterpieces of the Oral and Intangible Heritage of Humanity were released on May 18, 2001, by the United Nations Educational, Scientific, and Cultural Organisation (UNESCO) Convention for the Safeguarding of the Intangible Cultural Heritage (ICHC). Most worldwide sociocultural phenomena, such as music, theatre, ceremonies, and folklore, are acknowledged and safeguarded by this proclamation. Meanwhile, intangible cultural heritage is defined as "practices, representations, expressions, knowledge, and skills, as well as instruments, objects, artefacts, and cultural spaces associated with them that are recognised by communities, groups, and, in certain cases, individuals as part of their cultural heritage" (UNESCO, 2001). Therefore, given the need to preserve endangered (extinct and/or lost) intangible culture for future generations' knowledge and reference, cultural preservation initiatives are vitally needed and required (Prott, 1998). Indigenous knowledge is

progressively replaced and/or abandoned due to the modernisation and the simplicity of modern life, which leads to the loss of intangible culture. Particularly in the context of postnatal care for women among the Malay community in Sarawak, the recent development of information and communication technology and scientific breakthroughs may aid in the preservation of the intangible culture before indigenous knowledge and valuable local wisdom become reducible into folklore or historical relics.

In the context of traditional midwifery, scholars (Rozaimie *et al.*, 2022; Barriyyah, 2016; Haron and Hamiz, 2014; Barakhbah, 2007) stated that ethnobotanical studies are highly needed to scientifically emphasise the advantages of investigating a number of herbs and natural plants that are frequently used in daily life, especially among the Malay community, which adapts plants, herbs, and flora as sources of food and medicine to maintain health. It is essential to comprehend the morphology, anatomy, and applications of these plants to accurately identify and distinguish them. Although the Malay community's forebears acquired these skills, they were not directly transmitted to the present day through written documents or references. The lack of written records can be attributed to potential problems, including illiteracy among the ancestors, which led to a taboo against preserving records in written form (Rozaimie et al., 2022; Rozaimie *et al.*, 2023). Particularly, self-experimentation and the experience of seeing the efficacy of plants and herbs utilised in the daily lives of earlier ancestors are the initial sources of the knowledge or wisdom that was held. These phenomena put values on the herbs and plants and illustrate how the Malay people in the archipelago rely on plants and herbs that they find in their surroundings (Adnan and Othman, 2012).

Stated earlier, consuming a mixture of pulverised herbs, known locally as *irup* (a type of *jamu* or herbal medicine), is one of the millions of indigenous knowledge practices especially used in the traditional postpartum care for mothers, especially among Malays in Sarawak. The indigenous knowledge for precisely choosing, combining, and processing certain plants (free from toxins or material poisoning) to be applied to a lady after childbirth is one of the invaluable local expertise that is dwindling over time. *Jamu*, or herbal medicine, has been used for generations to treat illnesses and preserve health, especially among Indonesian indigenous communities according to Sumarni, Sudarmin, and Sumarti (2019). Sumarni *et al.* (2019) state that indigenous knowledge about traditional herbal medicine has never been properly investigated, regardless of its advantages, production methods, efforts to procure high-quality herbs, or the constituent components in medicinal plants. Types of *jamu* among the Javanese community, as discussed in the Sumarni *et al.* (2019) study, include *jamu kunir asem* (a mixture of turmeric and tamarind), *jamu beras kencur* (a mixture of rice and aromatic ginger), *jamu paitan*, *jamu godong kates* (papaya leaves as the main ingredient), *jamu cabe puyang* (a mixture of Java chilli and *lempoyang*), and *jamu temulawak* (the rhizome of *temu pauh* as the main ingredient). Additionally, to achieve the best possible taste and/or health advantages, some *jamu* makers add additional ingredients, including *kedawung* seeds, ginger, cardamom, *temu kunci*, cinnamon, turmeric, lime, and/or nutmeg.

In the traditional medicine of the Malays of Sarawak, assorted herbs and plants are mixed and processed into a powder, as illustrated in Figure 1. It is recommended that users take a tablespoon of the herbal powder twice a day, in the morning and late in the afternoon, and mix it with hot water. Specifically aimed at improving the healing process of the traditional postpartum treatment, there are two forms of *irup*: *irup sireh* (a herbal powder which mainly contains betel leaves) and *irup rempah* (an herbal powder which contains a mixture of spices). Traditional midwives or the traditional medicine practitioners advise consuming *irup sireh* (betel leaf powder diluted with warm water) every day for the first 15 days after childbirth, then followed by the *irup rempah* (spice powder diluted with warm water) for the next 15 days until the 40 or 44-day confinement period is over. However, if the baby is breastfed and has not yet been verified to be clear of jaundice symptoms, contemporary medicine does not advise a mother to consume a herbal medicine. Otherwise, it is suggested to consume the warm herbal drink in one large gulp and then follow it up with flavoured water, such as warm chocolate, to eliminate the bitter taste of the herbs (betel or spices). It is traditionally thought that the consumption of *irup* and other traditional herbal remedies promotes internal healing, particularly for uterine care, especially the removal of "*darah uguk*" (internal

bleeding, or lochia) that may still be embedded in a woman's uterus after childbirth. It is also thought that consuming this herbal medicine can aid in detoxification (removing toxins from the body), avoid bloating, promote blood circulation and body strength, and remove excess fat that has accumulated in bodily tissues (Hasbullah and Hassan, 2017; Latip and Omar, 2024). Thus, to maximise the benefits of traditional care and treatments, researchers (Rozaimie *et al.*, 2022; Barriyyah, 2016; Haron and Hamiz, 2014; Barakhbah, 2007) advocate that all midwifery's advice, guidelines and prohibitions be strictly followed during the confinement period. Traditionally, it has been considered that consuming decoctions or beverages made from mixes of hot-natured foods and beverages is essential for the natural healing process after childbirth (WH *et al.*, 2017; Adnan and Othman, 2012; Ong *et al.*, 2011; Barakbah, 2007). The following section discusses the methodology for gathering indigenous knowledge, specifically the type of herbs, spices, tree roots, and specific plants used to make an *irup* herbal powder.

FIGURE 1: *Available irup (herbal powders) on the market. (source: author)*

METHODOLOGY

This phenomenological paper sought to preserve and chronicle traditional postpartum care, which specifically discloses the different types of herbs and plants used to make *irup* (a mix of herbal powder) consumed after childbirth by women among Malays in Sarawak. Phenomenological research is defined as "*the understanding of the meaningful concrete relationships implied in the original description of experiences within a specific situational context, which becomes the primary target of phenomenological knowledge*" (Moustakas, 1994, p. 14). The key objective of this paper is to develop prevalent knowledge

about the various types of herbs and plants utilised to make *irup,* not to develop substantive theories, test conceptual models, or hypothesise, nor to generalise the fundamental understanding of the practice of consuming *irup*. Fundamentally, the traditional Malay midwifery practices and their indigenous knowledge and wisdom should be preserved in fostering the comprehension of societal development for the benefit and references of future generations.

Furthermore, using an ethnographic research approach explicitly seeks "*to experience a comprehensive description that provides a basis for reflective structural analysis to depict the essence of the experience*" (Moustakas, 1994) and is employed to examine the empirical phenomenon as discussed in this paper. The ethnographic approach is a form of narrative research in which knowledgeable and engaged people document and write about the subject matter being studied (Creswell, 2013; Creswell and Clark, 2017; Spry, 2001). Ethnographic technique is defined as "*a self-narrative that describes and/or critiques one's own position in relation to others within a social context*" (Spry, 2001: 710). Thus, cultural beliefs, assumptions, or the wider premise are reciprocated with knowledge, experience, discourse, and self-understanding (Trihn, 1991). According to Miller (1999), self-importance affirmations should be interpreted to validate self-criticism or self-reflection that motivates others based on their self-life experiences and knowledge, as well as their relationships with others in a sociocultural setting (Spry, 2001). Thus, informants are referred to their related indigenous knowledge, local wisdom, experiences, and skills, which serve as active agents in this study, where the ethnographic study's research specifically centres on the research focus subject—that is, the various types of herbs used to make *irup*. The absence of pertinent or prescribed reference materials and the requirement for observation and presentation of the distinct local socio-cultural environment (i.e., the use of herbs in traditional medicine, specifically regarding the making of herbal medicine of *irup* among the Malays in Sarawak) further demonstrate the reliability of the adapted ethnographic method as in this paper.

A certified practitioner of traditional and complementary medicine (TCM) (Malay traditional medicine) who possesses the necessary indigenous knowledge that she has acquired through experience, passed down, studied, and diligently practised recorded the data pertaining to the various types of herbs and plants used in the making of irup. As mentioned in the previous section, practitioners and traditional midwives hardly ever disclose the specific ingredients (plants and herbs) of the *irup* publicly. Thus, for instructional purposes and the exchange of indigenous knowledge, the empirical data presented in this paper was obtained from contacted traditional medicine practitioners, who then validated and verified the data with other midwives and traditional Malay medicine practitioners. Furthermore, using qualitative research methods as recommended by scholars (ref. Burgess, 1995), in-depth discussions arising from informal conversations with the involved informants to obtain preliminary empirical data (types of herbs and plants used in the making of *irup*). As a licensed practitioner of traditional Malay medicine, the main informant's indigenous knowledge and understanding were reciprocated with the empirical facts collected. Polkinghorne (2005) states that narrative storytelling, as used in the historiographic research technique, is empirical data that solely functions as an original account of an individual's experience and/or knowledge. Thus, in their context, the research findings presented in this paper through an ethnographic approach are descriptively unique. Meanwhile, the names of the informants referenced in this paper are pseudonyms to protect and preserve the privacy of their identities.

In presenting the study's findings, some herbal names, like *bigik kedaong* (*kedawung* seeds), are described in this paper as using the Sarawak Malay dialect. Referring to empirical data, the herbal composition utilised to make irup varies slightly according to the region or specific location from which traditional medicine practitioners come from (especially between the Asajaya, Samarahan, and Kuching districts). Traditionally, the *irup*'s ingredients are determined by the specific herbs and plants that are available according to the *irup* maker's geographical origin area. This phenomenon indicated an unstandardised *irup* recipe. Therefore, to determine the level of indexing codes associated with the types and local names of the involved herbs, the empirical data is illustrated and contextualised. Next, the indexed

codes were analysed to find any recurrent patterns or single commonalities. Based on a comprehension of the contextual information, the types of herbs and plants used to make *irup* were labelled. The ingredients or types of herbs and plants that were labelled were validated and verified by contacting midwives or traditional medical practitioners who have provided empirical data for this study again. In terms of research ethics, this paper complies with the Helsinki Declaration (WMA, 2024), which outlines ethical principles for medical research involving human participants. By sharing empirical data and providing a thorough explanation of the objectives of the study, traditional Malay midwifery and medical practitioners have expressed concern about the consent to publish information and indigenous knowledge about the types of herbs and plants traditionally used in the making of *irup* (Rozaimie, 2024). For the validity (Winter, 2000) and credibility (Patton, 1999) of the study methods and empirical data, the discussion of the research findings in this paper is therefore confidently and accurately portrayed and accepted. The following section discusses the study findings that descriptively illustrate the examination of the subjects highlighted in this paper.

FINDINGS

It is reiterated that the objective of this paper is to document and describe the types and general advantages of the herbs used to make *irup*, which is utilised in the postpartum care practices among Malays in Sarawak. Ms Hariah, a practitioner of traditional medicine from Sarawak's Kuching area, clarified:

> "The knowledge and practices of postpartum care and treatment were passed down from my late mother, especially during my confinement period after childbirth. She provides midwifery services and imparts her priceless traditional wisdom, which has been passed down through her elderly, both practically and orally, without the use of written notes. There are particularly two varieties of *irup* that are known to be consumed during the confinement period: 1. Betel leaf *irup*, which is specifically aimed at warming the lady's womb to expel lochia (clotted blood) and to treat internal wounds in the womb after childbirth. 2. Spice *irup*, which helps the body get rid of toxins or excess gas trapped in the womb and body. Additionally, some makers of traditional herbal medicines made other types of *irup*, like *pegaga* and turmeric *irup*, for specific uses." (Ms Hariah)

Nevertheless, Mrs Hariah did not give specific details regarding the geographic source of her knowledge of the types and composition of herbs, spices and plants mixed in those various types of *irup*. However, the empirical information gathered for this paper primarily addresses the ingredients, i.e., types of herbs used in the making of *irup*, to be consumed by a lady in confinement, particularly among the Malays in the Kuching area of Sarawak, which is listed in Table 1. In particular, the herbs' local names as narrated by the informants (further desk search for their scientific names and properties) were mentioned in the descriptions that followed.

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TABLE 1: Herbal ingredients in the *irup* mixture powder.

Spice irup (Source: Mak Uda)	*Betel leaves irup* (Source: Mak Uda)	*Spice irup* (Source: Puan Mas)
Bangley (bonglai)	Pinang tua	Bunga lawang
Bigik Kedaong	Pegaga	Bigik Kedaong
Jintan putih	Sireh	Cekur
Jintan manis		Cengkani (manjakani)
Ketumbar		Cengkih
Leyak mirah (halia bara)		Halia
Temuyang (Temu pauh/paoh)		Jintan hitam
		Jintan manis
		Jintan putih
		Kemukus
		Ketumbar
		Kulit kayu manis
		Maswi (kayu kasoyi)
		Musi

1. Bangley (bonglai) (*Zingiber cassumunar*): scientifically, it has been found to contain alkaloids, tannic acid, galactose, and sitosterol, which are used as medicine to treat hepatitis. Traditionally, it is used to help relieve fever and muscle pain, increase appetite, and treat wounds.

2. Bigik Kedaong (*Parkia timoriana*): scientifically, it is a source of carbohydrates, vitamins, minerals, and protein that exceeds other types of legumes. *Bigik kedaong* is traditionally believed to help improve inflammation of internal organs such as intestinal disorders, haemorrhoids, dysentery, diarrhoea, cancer, and skin diseases.

3. Bunga lawang (*Illicium verum*): a cooking spice recommended for breastfeeding mothers to increase milk production. Star anise can function as a sedative or an appetite stimulant.

4. Cekur (*Kaempferia galanga Linn*): the seeds or rhizomes of cekur are specifically used for treating cough and chest pain, in addition to being believed to help with digestive problems, particularly bloating. Curcuma is also believed to help reduce inflammation and body aches, as well as restore energy after childbirth.

5. Cengkani (manjakani) (*Quercus infectoria*): scientifically, it contains antiviral, antibacterial, and anti-larval properties that help improve the digestive system and is used as a laxative because it is high in fibre. Traditionally, it is used to help restore and improve the elasticity of the uterine wall.

6. Cengkih (*Syzygium aromaticum*): scientifically contains a lot of manganese, a mineral that helps the body produce enzymes to repair bones and regulate metabolism and energy. Traditionally, cloves are believed to help stabilise certain hormones in the body.

7. Jintan hitam (*Foeniculum vulgare*): scientifically, it contains high levels of carbohydrates and fibre, which help the digestive system and boost the body's disease resistance. Traditionally, it helps to restore skin damage that expands, especially among women during pregnancy.

8. Jintan manis (*Pimpinella anisum*): it is scientifically shown to have a significant analgesic effect similar to morphine and aspirin, and the fixed oil of anise was investigated for anti-inflammatory and analgesic activity in mice. Traditionally, this cooking spice is also believed to help overcome digestive issues, particularly bloating, and to expedite uterine recovery after childbirth.

9. Jintan putih (*Cuminum cyminum*): scientifically, cumin contains high iron content and plays a role in overcoming fatigue and strengthening the immune system to combat infections. Traditionally, cumin is also believed to be a traditional remedy with antiseptic properties and capable of addressing issues such as wind in the body, digestion, and muscle cramps.

10. Kayu kulit kayu manis (*Cinnamomum verum*): scientifically, it has been found to be rich in fibre, calcium, iron, and manganese, which can stabilise cholesterol and blood sugar levels, preserve the cardiovascular system, reduce the risk of cancer attacks, and prevent bacterial and fungal infections that cause diseases. Traditionally, it is believed to be able to overcome problems of depression, fatigue, and unpleasant body odour; relieve muscle tension; restore menstrual health for women; reduce acne; and help maintain skin smoothness.

11. Kemukus (*Piper cubeba*): is black pepper with the skin left on, traditionally believed to help treat various diseases such as syphilis, gonorrhoea, asthma, diarrhoea, stomach pain, and dysentery.

12. Ketumbar (*Coriandrum sativum*): scientifically investigated as a source of vitamin C, calcium, magnesium, potassium, and iron. Coriander seeds are traditionally believed to contain chemicals that may lower blood pressure by causing blood vessels to dilate. Meanwhile, coriander essential oil may have antibacterial effects.

13. Leyak mirah (halia bara) (*Zingiber officinale*): traditionally, it is believed to help treat problems with the digestive system, muscles, bones, and joints, as well as assist in weight loss.

14. Leyak (halia) (*Zingiber*): scientifically and traditionally helps the body eliminate germs and prevent common illnesses such as fever, cough, and colds; aids the digestive system and improves blood circulation.

15. Pegaga (*Centella asiatica*): scientifically, it is a source of triterpenoid chemicals that help protect the skin and improve blood circulation to heal wounds. Traditionally, it is believed to help heal wounds, particularly those involving the female uterus during childbirth, lower blood pressure, and have anti-ageing properties.

16. Pinang tua (*Areca catechu*): scientifically contains antibacterial properties. Traditionally, it is believed to help prevent problems related to the intestines and digestive system as well as the urinary tract.

17. Sirih (*Piper betle*): is a plant used for medicinal purposes, specifically to treat intestinal-related diseases, relieve bloating, and improve the digestive system.

18. Kemuyang/Temuyang (Temu pauh/paoh) (*Curcuma amada*): is an anti-cancer plant that is traditionally believed to help treat nerve tension, reduce cholesterol and high blood pressure, and help alleviate digestive tract issues and blocked blood vessels.

19. Maswi (kayu kasoyi) (*Cryptocarya massoy*): is a complementary ingredient in herbal mixtures or traditional medicine, also used as a fragrance and a calming agent.

20. Musi **No information obtained.*

Basically, all of the herbs mentioned above are thought to assist with excess gas issues (gas buildup in the digestive tract) as well as stomach discomfort and other digestive system issues, which are thought to be a primary cause of psychological casualties, postpartum depression or psychosis in women after childbirth. Without proper care and/or treatment, the symptoms of *meroyan* (postpartum depression) are traditionally thought to manifest during the confinement period after childbirth, after the confinement period has ended, or when a person reaches advanced menopause age. Consuming such herbs, spices, and plants is also thought to have beneficial effects in lowering blood pressure, fever, urinary tract infections, and pain associated with premenstrual syndrome (PMS). Factually, all traditional dietary recommendations or restrictions on food and beverages are believed to have a significant effect on a woman's ability to replenish her blood and hormones, reshape the physical form of her body, control her emotions, and maintain her spirituality after childbirth. The following section discusses the significance and ramifications of the traditional use of plants and herbs in postnatal care for women.

DISCUSSION

The study's findings, presented above, illustrate the Malay community's values, customs, and disposition towards Sarawak's natural resources. It must be acknowledged that, particularly in rural area in the past, local understanding regarding the utilisation of natural herbs and plants that reflect medical technology and survival skills, and communication and transportation, was extremely limited and challenging. Hence, in the past, the Malay community has attempted to establish alternatives for the medical treatment and healing remedies of medical issues encountered, especially those concerning their own, their families', and the community's health. The younger generation today seems to disregard the value of conventional postpartum care for women, which has many traditional medical professionals worried about this contemporary phenomenon. Even though modern medicine has proved the existence of medical issues involving postpartum depression, postpartum psychosis (serious mental disorders including delusions, hallucinations, or irrational behaviour), or postpartum depression (emotional stress) among women after childbirth, some young mothers today thought the phenomenon of postpartum psychological disturbances to be mere rhetoric (see Razali, 2016; Rozaimie *et al.*, 2022).

In the meantime, it's vital for verifying that the types of herbs specified by qualified and experienced midwives and/or practitioners of traditional medicine are genuinely grounded in the inherited Malay cultural viewpoint. Even though the mainstream of modern medicine is increasingly disregarding the practice of consuming *irup*, traditional treatments and care are continuously in demand as some traditional medicine practitioners actively foster the public's awareness of the benefits of this valuable indigenous knowledge and local wisdom, particularly pertaining to traditional postpartum care and the use of herbal medicine. Furthermore, the government, through the Ministry of Health Malaysia (KKM), supports and outlines the rules, accreditation, and registration for practitioners of traditional medicine, facilitating the preservation and sustaining of the valuable indigenous knowledge and local wisdom. Withers, Kharazmi, and Lim (2018) assert that comprehension and competency in practising traditional care procedures and techniques provide beneficial support for the emotional and mental well-being of women after childbirth. In particular, the Malay archipelago believes that consuming herbal medicine of *jamu* and *irup* has numerous natural benefits for stabilising hormonal changes in a woman's body, particularly during the postpartum confinement period and the transitional phases from pre-baby, pregnancy, and childbirth (Hartley *et al.*, 2018; Hasbullah and Hassan, 2017; Barakhbah, 2007) and is strongly thought of as a natural remedy to prevent or lessen the consequences of psychological problems or postpartum issues.

However, this study identifies several limitations and advocates further investigation, especially related to the consumption of *irup* in the traditional postpartum care and treatment. This study primarily enumerates the types of herbs, spices and plants that are used to make the powdered *irup* herbal mixture. The specific types of herbs, spices or plants used to make *irup*, the metric weight measurements of each herb, spice or plant mixture used, and the nutritional information (such as energy content, carbs, protein,

etc.) that are available in the market are all solely determined by the traditional herbal medicine maker's indigenous knowledge and wisdom that she inherited and believed in rather than by any particular standards. Therefore, this measurement issue proposes an immense amount of potential for further laboratory and clinical research, particularly for the growth of the local nutritional technology study. Scholars like Haron and Hamiz (2014) and Sumarni *et al.* (2019) have proposed that the scientific benefits, usage prescriptions or dosages, and nutritional facts are crucial health information that should be modelled and provide added value to products used for the traditional postpartum care and treatment. To correspond with the current nutritional system for medicine, foods, and beverages, it is imperative to establish a scientific standard for the nutritional facts and other relevant medical information of traditional herbs.

Specifically, the findings presented in this paper are not generalised to the indigenous knowledge held by other traditional postpartum practitioners, especially those coming from other parts of Sarawak. Other traditional postpartum practitioners or midwives might have distinct recipes, inherited indigenous knowledge, and a different understanding of the ingredients (plants, spices, and herbs) used to make herbal mixture powder of *irup*. Reiterated, the disparities in indigenous knowledge and local wisdom that exist are caused by different socio-ecological factors, including geographic factors, the availability of raw materials, spices, herbs, or plants in a specific area, local or specific beliefs about what works for their community groups (taboos), and other socio-ecological variations (Rozaimie, 2018; Withers, Kharazmi and Lim, 2018). Therefore, it is highly recommended that future research investigate, analyse, and collate empirical data on the herbal ingredients that other practitioners utilise in the making of *irup* and other related traditional herbal medicine. A comprehensive and holistic framework is essential to improve the reflectivity of traditional postpartum care practices for women and lessen bias in the attempt to generalise study findings and produce specific, reliable and verified standards, especially in the making of herbal remedies for postpartum care and treatment among Malays in Sarawak.

Indigenous knowledge, local wisdom, and local heritage must be preserved through appropriate theoretical and empirical education to gain public acceptance before they become extinct or lost to time (Rozaimie, 2024; Wahid, 2014). Socio-cultural preservation initiates by incorporating various viewpoints, stories, customs, and experiences into a database or specific academic programme; critically analysing intricate sociocultural problems; and encouraging a sense of patriotism and duty to protect the nation's heritage. According to Darling-Hammond *et al.* (2009), culturally relevant professional development programmes ought to set significant importance on learning via collaborative research, facilitated experiences, and ongoing reflection. The empirical data disclosed in this paper verifies the significance of social acceptability and social connectivity for subjective well-being, as emphasised by Arslan (2018) as a psychosocial resource for psychological empowerment. Hence, the final summary of this paper is discussed in the following conclusion section.

CONCLUSION

The findings and implications of the study, as presented in this paper, contribute to the diversity and enrichment of written indigenous cultural materials, especially those pertaining to indigenous knowledge and local wisdom, particularly regarding the plants, spices and herbs used in traditional herbal medicine and postpartum treatment among Malays in Sarawak. Planning for and navigating a more meaningful future becomes easier by comprehending, researching, and appreciating the past and the heritage inheritance from earlier generations. Indigenous knowledge, local wisdom, intangible heritage, and cultural transformation have all been profoundly impacted by urbanisation, economic development, and the innovation of digital technologies, among other modern changes. These developments have resulted in new insights into cultural expression and hybridisation (Rozaimie, 2024). This paper is primarily focused on uncovering the ambiguity of societal understanding regarding indigenous knowledge about the herbal ingredient of the *irup,* which is the beneficial socio-cultural heritage that must be preserved to promote understanding and appreciation of the indigenous knowledge and local wisdom. Scholars (Rozaimie, 2018; Withers *et al.*,

2018; Barriyyah, 2016; Haron and Hamiz, 2014; Adnan and Othman, 2012; Barakhbah, 2007) strongly advocate for and support traditional postpartum care and herbal medicine since these methods offer specific physical and psychological support and treatment and help to prevent isolation and other health difficulties, which may lead to psychological stress after childbirth. In conclusion, preserving indigenous knowledge is our responsibility, especially when it comes to the types of plants, spices and herbs used to make a herbal medicine of *irup*, as this indigenous knowledge and local wisdom need to be documented to sustain social identity, particularly among Sarawak's Malays.

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From Martial Art to Stage Performance: Modern Adaptations of Kuntau Among the Dayak Iban

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ABSTRACT

This study explores the transformation of kuntau, a traditional martial art of the Iban Dayak community. It traces its evolution from a symbol of male courage to its present role as a stage performance.". The study is guided by the following research questions: (i) How have the functions and meanings of kuntau changed over time? (ii) How does the Iban community perceive the contemporary practice of kuntau? and (iii) What adjustments have occurred in the movements, rituals, and performance styles of kuntau as it transitions into staged forms? The objective is to examine changes in function, community perception, and adjustments in practice and performance. Guided by a constructivist–interpretivist philosophy, the research employed a mixed approach involving a questionnaire administered to 122 respondents from Kuching, Samarahan, and Sri Aman, alongside field observations and in-depth interviews with five kuntau teachers. Findings indicate that while traditional elements such as floral movements, techniques, and symbolic values are preserved, adaptations for stage performance have altered movement patterns, minimized ritual practices, and introduced choreographic elements. Concerns over authenticity emerge particularly because these staged adaptations emphasize entertainment and visual appeal, sometimes at the expense of ritual depth and original combat intention. The discussion highlights the need to balance tradition with adaptation to contemporary contexts to ensure sustainability. This study contributes to the discourse on intangible cultural heritage preservation by providing insights into how cultural practices can evolve without losing their core identity.

Keywords: Dayak Iban; kuntau; Sarawak; martial art; stage performance

INTRODUCTION

Martial arts are recognized as part of the Intangible Cultural Heritage (ICH) (United Nations Educational, Scientific and Cultural Organization, n.d). They play a vital role in society, not only as mechanisms of self-defense but also as expressions of national identity, forms of sport and recreation, sources of education, and

even tourism products. Beyond their physical functions, martial arts nurture positive values such as discipline, obedience, responsibility, and perseverance. Across the world, martial arts manifest in diverse cultural contexts; for example, karate in Japanese society and kung fu in Chinese society. Within the Malay communities of Malaysia, Indonesia, and Brunei, *silat* has been extensively studied, developed, and recognized by UNESCO as an intangible cultural product. According to the UNESCO Convention for the Safeguarding of Intangible Cultural Heritage, ICH encompasses "the practices, representations, expressions, knowledge, skills—as well as the instruments, objects, artefacts and cultural spaces associated therewith—that communities, groups and, in some cases, individuals recognize as part of their cultural heritage" (UNESCO, 2020).

Awareness and knowledge of martial arts from other societies are often shaped by exposure to popular culture, particularly films and blockbusters featuring martial arts, the establishment of martial arts training centers, as well as the dissemination of knowledge through information technology. This has contributed to the widespread recognition and popularity of martial arts such as karate and kung fu. However, this same mechanism of popular culture dissemination has not benefitted Iban kuntau, which remains largely absent from mainstream media, commercial training networks, and digital representation, therefore limiting public awareness of its existence and cultural significance.

In contrast, within contemporary Iban society in Sarawak, awareness and understanding of kuntau as a traditional martial art rooted in Iban self-defense remain relatively limited and underdeveloped. This is influenced by several factors, including the lack of scholarly research and publications on kuntau (Farrer, 2006; Facal, 2012), the minimal presence of martial arts activities at the community level, and the broader impacts of rapid socio-economic change. As social change increasingly shapes everyday life, kuntau has not been exempt from transformation. In recent times, its purposes and contexts of practice have shifted, particularly regarding the functions it serves and the spaces in which it is performed.

Given this context, the study seeks to address the central research objective: to examine how Iban kuntau has transformed from a functional martial art into a staged cultural performance, focusing on changes in its functions, community perceptions, and contemporary practices. For instance, in Sumatra, Indonesia, the organizational systems established by kuntau groups have enabled its survival and adaptation through latent functions, ensuring its continuity despite changing social dynamics (Lidiantari et al., 2023). Recognizing these regional parallels, our research team undertook a study of Iban kuntau in Kuching, Samarahan, and Sri Aman with the aim of documenting and contributing to its preservation.

METHOD AND APPROACHES

The approach in this research adopted the constructivism-interpretivism philosophy of inquiry which requires the investigator to examine epistemology, ontology and axiology in the formation of the science on kuntau. This approach aligns with the interpretivist and constructivist framework that underpins this research, highlighting the significance of participants' experiences by examining how individuals perceive and interpret their realities (Creswell & Poth, 2018). According to Burns et al. (2022), the manifestation of the constructivism-interpretivism inquiry philosophy influenced the data collection, data analysis and findings of the study. For example, the researchers and respondents engaged in knowledge building on kuntau during face-to-face interview sessions and using online forms (i.e., Google Forms) or questionnaire administration that took into account values such as ethics and social norms such as respect and cooperation. In other words, in an effort to build knowledge about kuntau, cooperation between researchers and respondents has been carried out. In the data collection of this research, the researcher used observation which included observation of kuntau exercises or demonstrations, conducting surveys involving respondents, and interviews with kuntau practitioners or teachers.

The administration of survey form involving respondents helped the researcher make generalizations about kuntau practiced in Kuching, Samarahan and Sri Aman, Sarawak while observation, interviews with kuntau practitioners and teachers resulted in comprehensive and holistic knowledge about kuntau. The survey form has been conducted online and through face-to-face methods especially for respondents who live in areas outside the city or who do not have access to the Internet. Probing questions contribute to effective data collection among large sample of individuals (Giddens and Sutton, 2013).

The overall number of respondents of this study was 122 and from that number only 36 individuals claimed to be good at kuntau (see Table 1). Step in recognizing respondents who are good at kuntau has been conducted with the cooperation of the *ketua kaum* (leader of the tribe) and the *ketua masyarakat* (leader of the community) in the area of study. From the total of 36 individuals, reseachers has interviewed five kuntau teachers with three from Samarahan, one from Kuching and one from Sri Aman. All of the three divisions (refer to Map 1) were selected because active involvement in kuntau. Erickson (2011) argues that a holistic description with accuracy of facts is of paramount importance in research.

Data from the survey forms have been analyzed using the Statistical Package for Social Sciences (SPSS) and demographic background of the respondents have been analyzed such as age, level of education, employment and monthly income.

TABLE 1: Number and percentage of respondents

Category of Respondents	**Number of Respondents**	**Percentage**
Able to perform kuntau	36	29.6%
Unable to perform Kuntau	86	70.4%
Total	122	100.0%

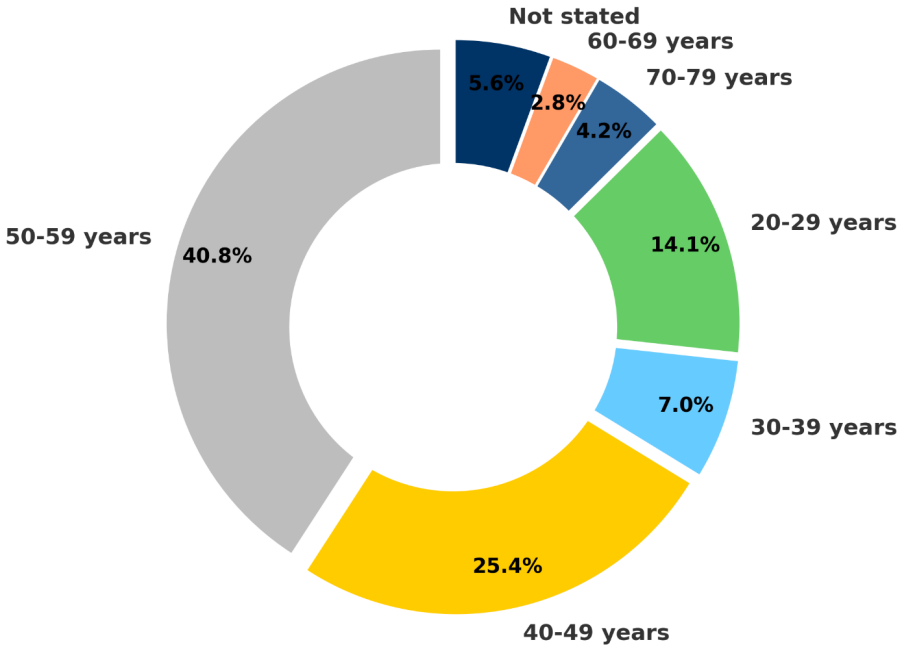

FIGURE 1: Age Categories of Respondents

In terms of age, the respondents ranged in age from 20 years to 79 years. 40.8% respondents were aged between 50–59 years, 25.4% were between 40–49 years, 14.1% were aged between 20–29 years, and 7.0% were between 30–39 years of age (Table 1). Refer Figure 1 for more information.

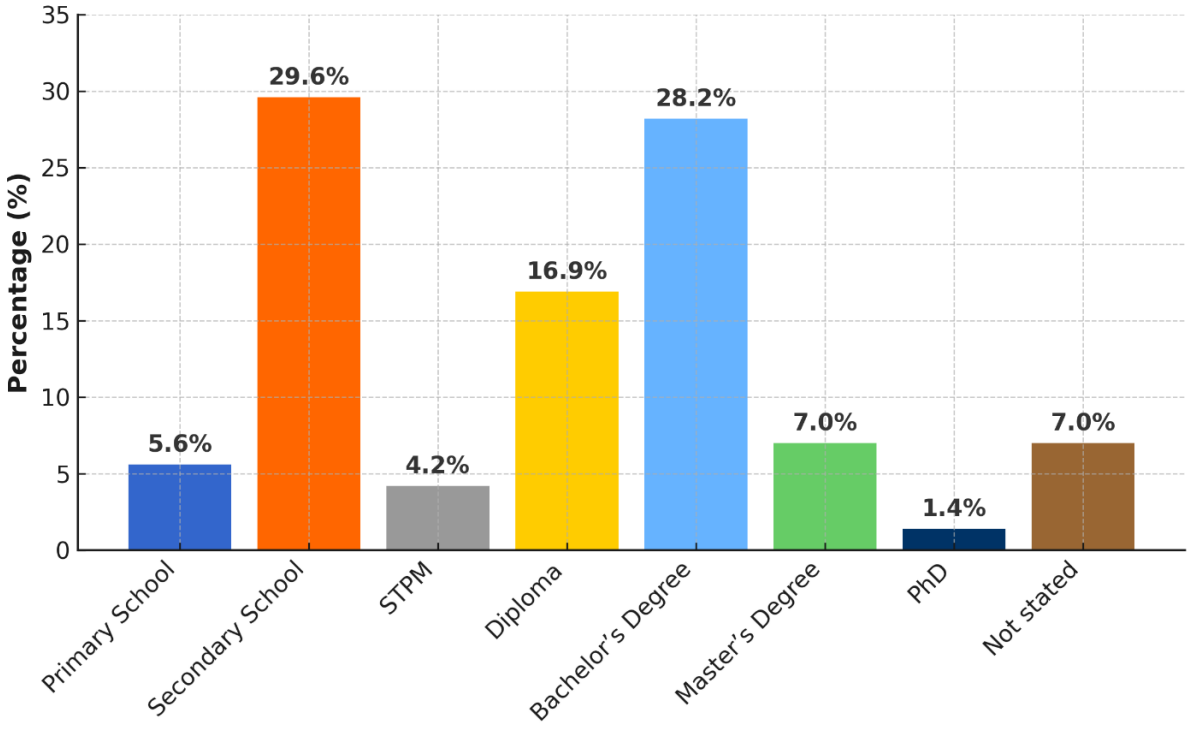

FIGURE 2: Level of Education

In terms of education, 29.6 % of the respondents had secondary school education, 28.2% had undergraduate education and 16.9% had education at the stage of degree. Details on the educational stage of the respondents are shown in Figure 2.

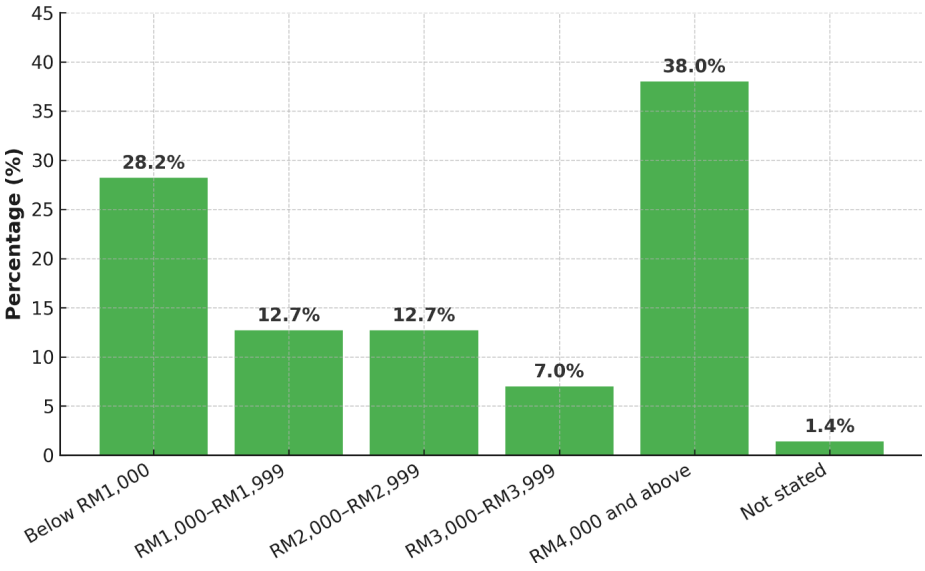

FIGURE 3: Monthly Income of Respondents

sIn the context of monthly income (refer Figure 4), 38.0% of respondents have monthly income of 4,000.00 Malaysian Ringgit (RM) and above, 28.2% had income of RM1,000.00 and below, 12.7% between RM1,000.00 to RM1,999.00 and 12.7% between RM2,000.00 and RM2,999.00. 39.4% of the respondents worked in the government (public) sector, 19.7% worked in the sector private, 19.7% self-employed, 7% are community leaders (*tuai rumah*), 5.6% students, 5.6% not working or retired, and 2.8% did not declare their occupation.

LITERATURE REVIEW

Scott (1956: 95) in his dictionary, "A Dictionary of Sea Dayak" defines kuntau as "Dayak boxing". This term is the earliest record used by western researchers about kuntau. The spelling of kuntau used by Scott (1956) is also used by researchers such as Facal (2012, 2017) and is also used in "A Comprehensive Iban-English Dictionary" (Ensireng, Salleh and Sutlive, 2016). Kamus Dewan Edisi Ketiga (2002) and Kamus Dewan Edisi Keempat (2008) suggested that kuntau may have been 'indigenized' based on local spelling and pronunciation. There are researchers such as Davies (2000) and Green (2001) who spelled the martial art of kuntau as kuntao. In the context of this study the term kuntau was used in line with the spelling used by the respondents.

Davies (2000) stated that kuntao has 4 classifications: first, regardless of origin, kuntao is a Chinese or Southeast Asian or other people's martial art; second, kuntao is a martial art of the Chinese orthodox; third, kuntao is a hybrid art or marginalise culture that combines Chinese martial arts with local methods, techniques and traditions in Southeast Asia; and lastly, kuntao is a pattern of Southeast Asian martial arts that is rooted in Chinese culture but has been fully integrated because indigenous culture is more dominant. In addition to Davies (2000), researcher such as Green (2001) also associate kuntao as the martial art of Chinese society in Southeast Asia. This is reinforced by Hernando and Siswantoyo (2018), who stated that the name kuntau or kuntao is also said to be originated from Chinese language, which means "fist path" as there is an influence of traditional Dayak martial art in Kalimantan Tengah and also countries like Malaysia, Thailand, Vietnam, Philippines and Indonesia.

The UN Educational, Scientific, and Cultural Organization (n.d) categorizes martial arts as an intangible cultural heritage. Martial arts function as a method of self-defense, a representation of national identity, a source of sport and entertainment, an educational tool, and a source for tourism. Martial arts can promote discipline, obedience, responsibility, and perseverance. Karate in Japan, kung fu in China and Silat in Malaysia and are forms of martial arts. UNESCO characterizes Intangible Cultural Heritage (ICH) as "the practices, representations, expressions, knowledge, skills; along with the instruments, objects, artifacts, and cultural spaces associated with them that communities, groups, and, in certain instances, individuals acknowledge as integral to their cultural heritage" (UNESCO, 2020).

Scholars have long noted that traditional martial arts often experience a process of transformation from their original combative functions to stage performance forms and it is a shift influenced by socio-cultural, political, and economic factors (Skowron-Markowska, 2021; Ciembroniewicz, 2019). Due to international tourism, martial arts are slowly changing its way from self-defense to a stage performance for audiences. Therefore, this transformation caused the martial practices to be adapted to meet the expectations of audiences and the demands of cultural tourism.

According to Green (2001: 533), the martial arts of kuntau and silat have distinct histories of development even if the communities practicing these cultures inhabit the same region or country. The element of confidentiality in the context of training may contribute to the developmental differences that manifest (Green, 2001). Farrer's (2006) studies in Singapore and Facal's (2012) in Brunei showed the generation of knowledge about kuntau was somewhat limited and kuntau development activities were somewhat lagging behind. Facal (2017) emphasizes that although the practice of martial arts in Southeast

Asia is rich in diversity, there are still streams of martial arts (e.g., kuntau) that receive less focus in the context of research (Facal, 2017).

Gerry and Osup (2021) also stated that the studies that have been conducted by researchers are more focused on the performances of kuntau internally but there is no holistic study conducted on kuntau. Therefore, Gerry and Osup (2021) recommend for future researchers to ensure the existence of reliable teachers to pass on the science of kuntau to the younger generation whether in the village or higher education institutions so that the martial art can be inherited to the younger generation. Although kuntau is slowly transforming itself from martial arts to stage performances, Ruswinarsih et al. (2023) suggested that further research regarding the development of traditional martial arts learning modules is necessary both at the community and school level for guaranteeing the development of traditional martial arts.

Despite its roots as a self-defense art, kuntau has increasingly adapted to modern contexts, transforming into staged performances shaped by cultural tourism and changing social functions. Yet, while existing studies have examined kuntau in broader Southeast Asian settings, little research has specifically explored its transformation within the Iban Dayak community. This study addresses that gap by focusing on the shift of kuntau from martial art to stage performance as a modern cultural adaptation.

FINDINGS

Overall, the survey and interview data consistently indicate that kuntau is undergoing a functional transition: from a practical martial art grounded in combat skills to a staged performance shaped by aesthetic expectations and cultural presentation. This shift forms the central pattern across respondents' experiences and perceptions, providing a clear empirical basis for discussing how kuntau is adapting to contemporary social contexts. The following sections elaborate on the specific forms of change namely; purpose, movement, understanding, and teaching practices.

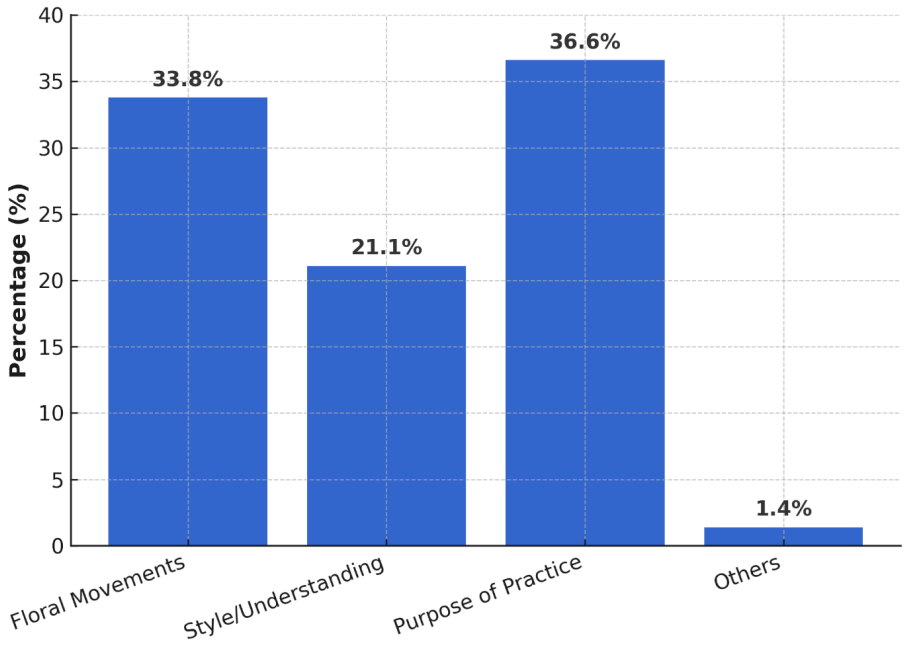

FIGURE 4: Forms of Change in Kuntau

The findings of the study show that kuntau Iban has undergone various forms of change in line with the circulation of time, social change, and external influences. The analysis of the survey found that the most obvious change is in terms of the purpose of kuntau practice which recorded the highest percentage of 36.6% as shown in Figure 4. Traditionally, kuntau was practiced as a single martial art skill that served to protect oneself and the community from physical threats. In the contemporary context, however, this function is increasingly turning to the purpose of performance or demonstration, especially in cultural ceremonies such as Gawai Dayak, state-ranking official events, or artistic performances on stage. This switching of functions suggests that although the symbolic value and cultural identity are still retained, the practical aspects of kuntau as a martial art are given less and less emphasis in daily life.

Movement Changes and Their Sociocultural Correlates

In addition to changes in the purpose of the practice, the forms of the kuntau movement also underwent modifications. A total of 33.8% of the respondents reported changes to floral movement (*bunga*), which are movements that are aesthetic in nature and symbolic elements in kuntau offerings. In comparison, traditional kuntau emphasizes more on the *buah* which is the attack and defense techniques that are practical and effective in real combat situations. In contrast, contemporary kuntau tends to accentuate *bunga* for the purpose of a visual performance that captures the attention of the audience. This prioritization of the aspect of *bunga* paralleled the need for stage performances that emphasized choreography, regularity of movement, and aesthetic appeal over combat effectiveness. Responses indicate that younger participants (especially those aged below 35) were more likely to identify changes in bunga than older practitioners. This suggests that younger generations engage with kuntau primarily through cultural performances and social media rather than in combat-oriented contexts.

Changes in Understanding and Transmission of Kuntau

The next form of change involved the flow or understanding of kuntau, which was noted by 21.1% of respondents. These changes refer to the way kuntau is understood, taught, and practiced by the current generation, which may differ from the traditional approach. Traditional kuntau is usually taught through a process that is closed in nature and full of elements of secrecy, while contemporary kuntau is more open to the general public, especially through lay performances and social media. These changes also reflect the adjustment of kuntau to modern realities where the openness of access to knowledge and exposure to various other forms of martial arts influences the style of teaching and practice.

Respondents with higher awareness levels towards the high level of security and peace were more likely to report changes in teaching styles and openness. These shifts were most frequently noted among respondents who perceived their environments as safe and stable, suggesting that higher awareness of social security correlates with greater acceptance and recognition of openness in kuntau teaching practices.

Perspectives from Kuntau Teachers

The results of the interview with kuntau teachers revealed that traditional kuntau practitioners tend not to be forthcoming about their skills and knowledge. This is done to avoid being tested by parties who have ill intentions or want to challenge their abilities. An experienced kuntau teacher, who had studied with several teachers, affirmed that hiding one's expertise gave one a sense of safety to move freely outside one's residential area without attracting unwanted attention. This humble and conscientious attitude reflects an ethical value in kuntau that prioritizes the use of knowledge at a reasonable time and not for mere display purposes. This ethical stance reflects a core traditional value: kuntau is to be used responsibly, and never

for unnecessary display. Such perspectives contrast with modern performance-oriented practices and reinforce tension between authenticity and visibility.

Cultural Exchange and Multicultural Influences

Interestingly, a small number of respondents who were Iban and lived adjacent to the Malay community admitted to having studied *silat* from teachers of Malay ethnicity. It is aimed at increasing their martial skills alongside knowledge in kuntau. This phenomenon suggests that although the respondents appreciate kuntau as a Dayak Iban heritage, they are also open-minded towards martial arts of other communities such as Malay *Silat* and Chinese martial arts. This state of affairs reflects the process of cultural exchange that prevails inherently within the plural society in Sarawak.

Respondents who learned silat or Chinese martial arts were predominantly from border zones between ethnic communities. These crossover participants were more likely to perceive kuntau as "evolving" rather than "declining," perhaps due to their broader exposure to martial arts diversity.

Strategies for Sustaining Kuntau

To overcome the challenges and changes in kuntau practice, kuntau teachers and practitioners are involved in various initiatives. Among the steps taken include trying to maintain the traditional form of kuntau, providing awareness to the younger generation about the values and history of kuntau, as well as engaging in community discussions to maintain the rules of Kuntau practice based on traditional values. These efforts are important for ensuring that even as kuntau undergoes adjustments to modern contexts, its foundational values as a martial art of Dayak Iban heritage are maintained and passed on.

Academic Discussion: Functional Changes And Adaptation Of Iban Kuntau

Like other aspects of social life such as language use, diet, and social interaction, the martial art of kuntau is no exception to the currents of change spurred by historical, socioeconomic, and cultural factors. This change can be seen in three main elements namely the purpose of practice, the form of *bunga* movement, and the flow or understanding of kuntau. The most significant factor that influenced the change in the function of Kuntau was the existence of a safety in Sarawak as a result of the success of the police and army in maintaining security and safety. This situation has reduced the need for practitioners to practice kuntau in the context of actual self-defense. In addition, the reduced functional need for combat has opened space for kuntau to be reinterpreted in forms that are more publicly visible and culturally valuable, particularly in performative settings.

As a result of these changes in surroundings, most Kuntau practitioners have channeled their skills into forms of stage performance and demonstration activities that serve as cultural symbols. Kuntau is now often presented in events such as the opening of cultural ceremonies, Gawai Dayak festival, or official state-level events. This phenomenon is in line with the findings of the study by Ruswinarsih et al. (2023) in the context of the Ngaju Dayak ethnic group in Indonesia, where kuntau is better known as a traditional martial art that is often presented in traditional wedding ceremonies. This performance serves as an obstacle-breaking ritual, with the hope that the bride and groom can face all the challenges of life in the future. Although the practical purpose of kuntau as a self-defense tool is diminishing, the value of kuntau as a cultural heritage does not remain significant in fostering Iban ethnic identity. In the contemporary context, kuntau performance also become part of a narrative of cultural tourism that highlights the richness of local traditional art to a wider audience. The preference for stage performance can further be understood through the lens of cultural commodification, where visually appealing traditions are increasingly packaged for

festivals, tourism, and state-sponsored cultural showcases. Such performances also function as expressions of identity politics, allowing the Iban community to assert cultural visibility within Sarawak's plural society.

However, the transition to stage performances and demonstrations does not mean kuntau has completely lost its original function. Martial arts, whether traditional or modern, are not only self-defense skills, but also self-development tools that contribute to increased self-confidence, personal discipline, and mental resilience (Gerry & Osup, 2021). Therefore, although rarely used for actual fighting purposes, kuntau is still relevant as a medium of physical and spiritual education, especially if taught while retaining elements of its original ethical traditions and values.

These changes also reflect the concept of cultural adaptation whereby communities adapt their practices to current circumstances while trying to retain aspects of heritage that are considered important (Hobsbawm & Ranger, 1983; UNESCO, 2020). Precisely, the main challenge for the Iban community is to find a balance between maintaining the authenticity of tradition and meeting contemporary needs so that kuntau can be inherited by future generations without losing its symbolic and technical value. This balancing act is crucial because excessive emphasis on performance risks reducing technical depth, while strict preservation without adaptation may reduce relevance in modern cultural and economic contexts.

The preservation of kuntau martial arts requires a strategic approach involving multiple parties rather than individuals and communities, also extended to government agencies at the state and national levels. Based on the findings of the study, there are several basic steps that need to be taken to ensure the survival of kuntau as an intangible cultural heritage of the Iban Dayak community.

Firstly, the effort needs to start by identifying Kuntau teachers and individuals who still have these skills at the village or regional level. This skills inventory is important not only for documentation purposes, but also as a foundation for developing the next generation of successors. The collection of information on the number, location, and stage of proficiency of Kuntau practitioners allows training design and knowledge transfer to be carried out in a more orderly manner.

Secondly, it is important to examine the role that can be played at each level. At the individual level, kuntau practitioners can become mentors or trainers to teach the basics of kuntau to young people. At the household level, parents can encourage children's participation in kuntau activities as part of value-based and discipline-oriented education. At the community level, Kuntau associations or clubs may organize classes, workshops, and competitions to attract community interest. While at the state level, government agencies may provide incentives, funds, and stage performance platforms for promoting the prestige of kuntau at the national and international levels. Such multilevel involvement is essential because the contemporary visibility of kuntau increasingly depends on public cultural platforms, festival circuits, and tourism-driven programming rather than everyday functional use.

Thirdly, this study emphasizes the need to examine the current challenges faced in efforts to sustain kuntau. Among the main challenges are the lack of interest among the younger generation, the lack of active teachers, funding constraints, and the negative perceptions held by certain segments of the community towards elements of the tradition such as *Miring* rituals. Without a clear strategy for dealing with these challenges, preservation efforts risk being stalled midway. To ensuring the effectiveness of the strategy, the approaches that have been used need to be assessed. This assessment includes an analysis of the strengths and weaknesses of existing programs, whether they involve community classes, stage performances, or outreach initiatives. Successful programs may be expanded, while weaknesses need to be addressed through enhancements or adaptations.

In addition, some practical recommendations may be implemented to strengthen this effort. First, integrate kuntau in formal education, for example as a co-curricular activity in primary and secondary schools. This approach not only encourages early interest among students but also integrates kuntau into the process of character formation and self-discipline. Second, increase the demonstration of kuntau stage performances in official government events, cultural festivals, and official ceremonies that have a high community presence. Such exposure can raise public awareness and strengthen the image of kuntau as a symbol of Iban cultural identity. Without systematic collective action, kuntau risks becoming merely a cultural artifact that only manifests in documentation, rather than as an active practice in community life. Strengthening its role in stage performance, however, may continue to be the most practical pathway for visibility and survival, particularly within cultural tourism economies and contemporary identity expression.

SCOPE AND LIMITATION

This study examines the transformation of the traditional martial art of kuntau among Dayak Iban communities in Kuching, Samarahan, and Sri Aman, with a focus on the change in function from martial art to stage performance, the community's perception of kuntau as an intangible cultural heritage, as well as modern forms of adaptation prevailing in techniques, rituals, and delivery. Findings were obtained through a review of inquiry questions involving 122 respondents, field observations, and in-depth interviews with five Kuntau teachers.

This study is limited to three parts of Sarawak and only 36 respondents practice kuntau, therefore the findings do not represent the entire Iban community. The study period (2019–2021) included a phase of the COVID-19 pandemic that required direct observation, while all Kuntau teachers found were 60 years old and above, limiting the perspective of the younger generation. Cultural and religious sensitivity factors also hinder the exposure of some traditional rituals.

CONCLUSION

This study has documented and analyzed the transformation of kuntau, a traditional martial art of the Iban Dayak community, from its original function as a self-defense skill and marker of male courage into a staged cultural performance. Drawing on survey data, field observations, and in-depth interviews with practitioners, the findings show that while symbolic values, floral movements (bunga), and certain technical aspects are preserved, the emphasis has shifted toward choreographed, aesthetic presentations for cultural ceremonies, festivals, and official events. This adaptation reflects broader socio-cultural changes, including the decline in everyday self-defense needs, the influence of inter-ethnic exchange, and the openness of practice in the contemporary era. By focusing specifically on Iban kuntau, an area with minimal prior research, this study contributes new empirical insight to the scholarship on Bornean martial arts and expands theoretical discussions on cultural adaptation within intangible heritage studies.

Although concerns over authenticity remain, kuntau continues to be regarded as an important intangible cultural heritage that reinforces Iban identity. Its evolution demonstrates the processes of cultural adaptation and hybridization described in scholarly literature, where communities retain core traditions while modifying form and function to suit present-day contexts. The study underscores the need for strategic preservation efforts involving practitioners, households, communities, and government agencies, with initiatives ranging from skills documentation and mentorship to integration into educational and tourism platforms. Among these, the most critical and feasible recommendation is the systematic documentation and identification of existing practitioners, as this forms the foundation for transmission, curriculum development, and long-term preservation planning.

Ultimately, sustaining kuntau requires balancing tradition with innovation by ensuring that its performative adaptations do not erode its historical depth, technical integrity, and cultural meaning. By recognizing kuntau as both a living heritage and a dynamic art form, stakeholders can support its continued relevance and transmission to future generations while safeguarding its identity in the face of modern change. In doing so, this study provides a framework that may guide future research on how marginalized or lesser-known martial traditions adapt, survive, and remain meaningful in rapidly transforming societies.

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Imbuhan Kata Kerja Bahasa Iban dalam Laras Formal (Iban Verbal Affixes in Formal Register)

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ABSTRAK

Bahasa Iban sudah lama bertapak sebagai bahasa tulisan, namun penerbitan yang meneliti penggunaanya dalam laras formal masih kurang diusahakan. Justeru, kajian ini meneliti imbuhan kata kerja dalam laras formal dan membuat perbandingan imbuhan kata kerja bahasa Iban dengan bahasa Melayu. Kajian ini menerapkan kerangka Nahu Sistem (Asmah, 2009) dalam analisis data, serta memanfaatkan data dari akhbar Suara Sarawak. Keseluruhan data kajian ialah sebanyak 120 kolum (24000 patah perkataan). Imbuhan kata kerja dalam bahasa Iban yang ditemui ialah seperti berikut: Awalan (be-di-, dike-, te-,N-); Apitan (be-ka, di-ka, dipe-ka, te-ka, N-ka); Akhiran (-ka). Kesemua imbuhan ini sangat produktif dalam menerbitkan pelbagai jenis kata kerja. Meskipun sesetengah imbuhan ini diserap terus ke dalam bahasa Iban melalui proses peminjaman kata, namun telah diperluaskan gabungannya dengan kosa kata jati bahasa Iban. Kemunculan imbuhan kompleks merupakan perkembangan baru bersesuaian dengan gaya penulisan formal. Proses penggantian konsonan berhomorgan di posisi awal kata dasar turut produktif, dan ia merupakan ciri khusus bahasa Iban. Meskipun kajian ini hanya meneliti kata kerja, namun serba sedikit ia telah memperlihatkan pengaruh bahasa Melayu terhadap perkembangan laras formal dalam bahasa Iban serta transformasinya dari bahasa lisan ke bahasa tulisan.

Kata kunci*: Kata kerja; bahasa Iban; laras berita; pengimbuhan; laras formal*

PENDAHULUAN

Negeri Sarawak kaya dengan khazanah bahasanya dan berdasarkan hasil kajian leksikostatistik, lebih daripada 51 bahasa sukuan telah dikenal pasti (Norazuna, 2021). Namun, deskripsi morfologi (dan aspek linguistik yang lain) kebanyakan bahasa-bahasa ini belum dilakukan secara komprehensif. Deskripsi asas sistem linguistik bahasa-bahasa ini perlu lebih banyak diusahakan (Asmah & Norazuna, 2020).

Bahasa Iban merupakan satu-satunya bahasa sukuan di Sarawak selain bahasa Melayu yang sudah menjadi bahasa tulisan dan diajar di sekolah sejak tahun 1955. Walaupun demikian, proses pengimbuhan

(dan proses morfologi lain) dalam bahasa Iban masih memerlukan penelitian susulan dan data baharu. Selain meneliti proses pengimbuhan dan penggantian dalam bahasa Iban, makalah ini turut membandingkan imbuhan kata kerja dalam bahasa Iban dengan bahasa Melayu. Perbandingan awal ini boleh menunjukkan pengaruh bahasa Melayu terhadap perkembangan laras formal dalam bahasa Iban khususnya dalam penulisan teks berita. Penelitian penggunaan bahasa Iban dalam konteks formal perlu kerana ia turut menyumbang kepada perkembangan, kemajuan dan transformasi bahasa Iban dari bahasa lisan ke bahasa tulisan.

Kekerapan penggunaan imbuhan tertentu dalam bahasa Iban berkait rapat dengan jenis data sama ada data dari bahasa pertuturan atau teks bahasa formal. Kajian-kajian terdahulu kebanyakannya memanfaatkan data dari kerja lapangan (bahasa tidak formal) dan cerita rakyat sebagai data korpus. Kajian ini pula menyajikan sumber data dari teks berita dalam konteks formal. Justeru, pemilihan korpus bahasa yang berbeza dalam kajian ini akan memberi dapatan baharu tentang penggunaan imbuhan dalam bahasa ini.

SOROTAN LITERATUR

Meskipun bahasa Iban sudah lama digunakan sebagai bahasa tulisan, namun tidak banyak kajian susulan yang mendeskripsi bahasa ini dan variasinya dengan terperinci. Jadual 1 merumuskan fokus perbincangan kajian lepas tentang imbuhan kata kerja dalam bahasa Iban.

JADUAL 1: Perbandingan jenis imbuhan kata kerja dalam bahasa Iban dari kajian terdahulu

Asmah (2013/1969)	Zaiton & Rohani (2003)	Asmah & Rosline (2012)	Rahim et al. (2014)	Ericca et al. (2022)	Chong (2021)
N-	-	N-	N-	N-	N-
en-	-	en-	en-	en-	-
be-	be-	be-	beR-	be-	be-
te-	te-	te-	-	te-	te-
di-	di-	di-	di-	di-	di-
me-	-	me-	-	-	m-
se-	se-	-	-	-	
-	-	pe-	-	-	pe-
-	-	ke-	-	-	
beke-	-	Beke-	-	-	-
bete-	-	bete-		-	-
-ka	-ka	-ka	-ka	-	-
N-ka	-	N-ka	N-ka	-	N-ka
ke-ka	-	-	-	-	-
te-ka	-	-	te-ka	-	-
-	-	-	-	-	dike-
-	-	-	-	-	di-ka
-	-	-	-	-	dipe-ka
-	-	-	-	-	be-ka

Asmah (2013) telah membukukan tesis Sarjana Kedoktoran beliau yang bertajuk, *The Iban Language of Sarawak: A Grammatical Description*. Kajian ini merupakan satu-satunya tulisan yang memeri sistem linguistik bahasa Iban dengan komprehensif. Perbincangan aspek morfologi dalam buku ini merangkumi morfem verbal dan nominal yang membentuk kata terbitan dalam bahasa Iban. Zaiton dan Rohani (2003) membuat perbandingan imbuhan kata kerja antara bahasa Iban dengan bahasa Melayu. Rahim et al. (2014) pula membincangkan proses pengimbuhan dalam kata nama, kata kerja dan kata adjektif dalam varian-varian bahasa Iban. Ericca et al. (2022) hanya meneliti aspek imbuhan awalan yang membentuk kata kerja dalam bahasa Iban. Chong (2021) pula berpendapat bahasa Iban dianggap sebagai bahasa koine iaitu bahasa yang telah mengalami penyeragaman dialek. Hasil daripada penyeragaman tersebut, bahasa Iban standard mempunyai imbuhan yang telah mantap seperti *be-, di-, dike-, te-, N-, m-, pe,-ka, be-ka, di-ka, dipe-ka, N-ka.* Di peringkat sekolah, kategori kata Iban yang diajar merangkumi kata kerja, kata nama, kata adjektif, kata bilangan dan kata tugas. Setiap golongan kata tersebut mempunyai subkategorinya. Imbuhan yang dibincangkan dalam buku teks Tahun 4 hingga Tahun 6 di peringkat sekolah terdiri daripada *ny-, ng-, di-, pe-, me-, be-, te-,* dan *-ka.* (Chemoline, 2013)

METODOLOGI

Kajian ini merupakan kajian berbentuk kualitatif deskriptif dan menggunakan kerangka teori Nahu Sistem yang diperkenalkan oleh Asmah (2009). Nahu ini berasaskan teori Sistemik-fungsional oleh Halliday (1985) yang menekankan analisis bentuk dan struktur kata berdasarkan makna dalam konteks penggunaannya. Berdasarkan nahu ini, kata kerja boleh memiliki lebih dari satu ciri atau jenis. Misalnya, perkataan *berjual* boleh tergolong dalam kategori "perbuatan kendiri" pada masa yang sama menunjukkan "perbuatan yang mendatangkan hasil". Kajian ini menerapkan sepenuhnya kerangka nahu Asmah ini dalam analisis data. Justeru, pengertian konsep-konsep asas tidak perlu diulang sitasinya dalam melaporkan dapatan kajian. Selain itu, kajian ini turut menggunakan konsep-konsep dari kerangka aliran struktural dalam menerangkan fungsi kata kerja ini berdasarkan konteks penggunaannya dalam ayat. Asmah berpendapat pemaparan nahu (Melayu) tidak harus terikat kepada aliran tertentu kerana satu-satu aliran tertentu itu tidak dapat menerangkan sebanyak mungkin gejala yang ada dalam bahasa.

Nahu berasaskan sistemik-fungsional menekan makna sesuatu unit atau unsur bahasa berdasarkan konteks penggunaannya termasuk dalam laras atau *genre* tertentu. Justeru,kerangka nahu ini amat bertepatan dengan kajian ini yang melihat makna imbuhan kata kerja dalam laras berita. Sebagai perbandingan, analisis nahu dalam aliran struktural meneliti hubungan sintagmatik dan paradigmatik antara unit-unit dalam sistem linguistik sesuatu bahasa serta mengenal pasti unsur-unsur nahu berdasarkan distributsi dalam kata, frasa dan ayat. Pendekata, penekanan analisis berdasarkan struktur sahaja. Analisis makna unit bahasa terhasil dengan meneliti hubungan di antara kata-kata yang membentuk frasa, klausa dan ayat, serta kedudukan unsur-unsur ini dalam membentuk pelbagai jenis dan struktur ayat. Kajian ini tidak menidakkan sumbangan aliran struktural yang telah mewujudkan landasan untuk analisis sistem bahasa secara sistematik. Malah analisis dalam kajian ini turut menggunakan beberapa konsep dari struktural untuk menerangkan fungsi imbuhan dan kata kerja terbitan yang dihasilkan. Beberapa konsep tersebut seperti misalnya, ialah kata kerja transitif dan tak transitif, kata kerja aktif dan kata kerja pasif, dan sebagainya.

Data kajian ini diperolehi daripada ruangan berita bahasa Iban dalam surat khabar *Suara Sarawak*. Setiap kolum berita tersebut mengandungi kira-kira 200 patah perkataan. Teks berita yang dipilih berkaitan isu-isu politik, ekonomi, pendidikan dan pertanian, sosial dan bencana. Jumlah keseluruhan teks berita ialah sebanyak 120 teks (24000 patah perkataan), dan analisis kajian berdasarkan 135 kata kerja. Korpus kata kerja dikumpul dari teks berita bulan Ogos 2021 hingga Disember 2021, serta Januari 2022 hingga April 2022. Teks tersebut diambil secara rawak. Akhbar-akhbar tempatan Sarawak seperti *Utusan Sarawak* dan *Utusan Borneo* juga memuatkan berita dalam bahasa Iban, namun kajian ini hanya memilih *Suara Sarawak* memandangkan isi kandungannya tidak jauh berbeza antara satu sama lain. Selain itu, gaya penulisan dalam

akhbar-akhbar tersebut juga tidak banyak perbezaan, justeru kajian ini hanya mengambil korpus kata kerja dari satu akhbar sahaja.

DAPATAN KAJIAN

Pelaporan dapatan kajian dalam bahagian ini memberi tumpuan kepada dua proses pembentukan kata kerja dalam bahasa Iban iaitu penggantian dan pengimbuhan. Asmah (2009) memberi pengertian kata kerja seperti berikut:

> Kata yang berfungsi pada predikat dalam Subjek-Predikat-(objek)-(Ajung), dan terbahagi kepada dua kategori utama iaitu kata kerja leksikal dan kata kerja bantu. Kata kerja leksikal pula boleh digolongkan kepada dua subkategori ialah kata kerja perbuatan dan kata kerja keadaan. Berbeza dari golongan kata kerja keadaan, dalam ayat yang menggunakan kata kerja perbuatan, subjeknya adalah juga perlaku. Kata kerja perbuatan terdiri daripada beberapa subkategori yang memperlihat ada atau tiada ciri-ciri makna tertentu.
>
> (hlm. 107-108)

Kata kerja dalam bahasa Iban terbahagi kepada dua kategori utama iaitu (i) Kata kerja perbuatan, dan (ii) Kata kerja keadaan. Kata kerja perbuatan pula mempunyai pelbagai jenis, antaranya kata kerja perbuatan sengaja - tak sengaja, perbuatan kendiri - luar kendiri, kata kerja perbuatan menyebabkan-tak menyebabkan, menghasilkan - tak menghasilkan, menyaling - tak menyaling, perbuatan seketika – berterusan dan kata kerja perbuatan memanfaatkan – tak memanfaatkan. Manakala, subgolongan bagi kata kerja keadaan pula antaranya ialah kata kerja kepunyaan, peristiwa dan pemerian.

Proses Pengimbuhan

Dari segi strukturnya, kata kerja dalam bahasa Iban terdiri daripada kata kerja selapis, dua lapis dan kompleks. Kata kerja selapis terdiri daripada kata akar (*kabak, jalai, temu*) manakala kata kerja dua lapis pula merupakan kata yang telah menerima satu jenis imbuhan sahaja sama ada awalan atau akhiran seperti dalam perkataan ***di****tusun (disusun)* ***te****kabak (tercabut), dan ketu****ka*** *(hentikan)*. Kata kerja kompleks menerima lebih daripada satu jenis imbuhan. Sebagai contoh, ***di****ke*jaku***ka*** (diperkatakan) terhasil dari gabungan apitan *dike-ka* dengan kata dasar *jaku* (cakap). Perkataan ***be****tusun****ka*** (menyusunkan) pula adalah gabungan apitan *be-ka* dengan kata dasar *tusun* (susun).

Dari segi fungsinya, proses pengimbuhan menyebabkan berlaku perubahan pada kategori kata, atau membawa perubahan fungsi nahu sesuatu kata. Misalnya, kata dasar yang menerbitkan kata kerja terbitan *bergambar* ialah kata nama. Proses pengimbuhan ini menyebabkan kategori kata berubah dari kata nama kepada kata kerja. Ada kalanya kategori kata tidak berubah atau dikekalkan namun berubah fungsi nahu dan maknanya seperti dalam perkataan *bejual* (berniaga) dan *bejualka* (menjual). Perkataan *bejual* berfungsi sebagai kata kerja pasif manakala *bejualka* sebagai kata kerja aktif transitif yang memerlukan objek penyambut untuk melengkapi makna ayat.

Jumlah imbuhan yang membentuk kata kerja terbitan bahasa Iban yang ditemui dalam data kajian ini keseluruhannya ada 11 imbuhan iaitu 5 awalan (be-, di-, dike-,te-, dan N-), 5 apitan (be-ka, di-ka, dipe-ka, te-ka, N-ka) dan 1 akhiran (-ka). *Morfem N-* mempunyai alamorf berikut: *m, n, ng, ny*, dan *nge*. Semua imbuhan ini sangat produktif dalam bahasa Iban dalam erti kata imbuhan-imbuhan tersebut boleh digabungkan dengan kata dasar dari kosa kata jati bahasa Iban atau kosa kata bahasa Melayu. Setakat ini, boleh dirumuskan kata dasar yang paling kerap ditemui dalam pembentukan kata kerja terbitan terdiri dari kata nama dan kata kerja. Kata sifat sebagai kata dasar yang membentuk kata kerja terbitan jarang ditemui

dalam data kajian ini. Perbincangan seterusnya menerangkan fungsi dan makna imbuhan-imbuhan ini dalam menerbitkan kata kerja terbitan dalam bahasa Iban.

Imbuhan awalan

Jadual 2 merumuskan lima jenis awalan dalam bahasa Iban dan fungsi setiap satunya dalam menghasilkan pelbagai makna kata kerja terbitan.

JADUAL 2: Imbuhan awalan *be-*, *di-*, *dite*, *te-* dan *N-*

Kategori Kata Kerja	**Makna**	**Kata Kerja**	**Kata Dasar**
	be + kata dasar		
KK Kendiri	Bergambar	*begambar*	*gambar* (KN)
KK Menyebabkan	Bergaduh	*belaya*	*laya* (KK)
KKTidak Menyebabkan	Bercakap	*bejaku*	*jaku* (KK)
KK Menghasilkan	Berjual	*bejual*	*jual* (KK)
KK Seketika	Berehat	*belelak*	*lelak* (KN)
	di + kata dasar; *di* + *ke* + kata dasar		
KK Luar Kendiri	Ditikam	*dibanchak*	*banchak* (KK)
KKTidak Menyebabkan	Disusun	*ditusun*	*tusun* (KK)
KK Luar Kendiri	Diberikan	*diberi*	*beri* (KK)
KK Kepunyaan	Dimiliki	*diempu*	*empu* (KN)
KK Menyaling	Diizinkan	*dikemendar*	*bendar* (KN)
	te + *kata dasar*		
KK Tidak Sengaja	Tercabut	*tekabak*	*kabak* (KK)
KK Tidak Sengaja	Terhantuk	*tepangka*	*pangka* (KK)
KK Kendiri	Terinspirasi	*teperansang*	*peransang* (KN)
	N + *kata dasar*		
KK Menyebabkan	Menyelongkar	*nyerungkai*	*serungkai* (KK)
KK Menyaling	Menganjurkan	*ngatur*	*atur* (KN)
KK Sengaja	Menyimpan	*ngirai*	*kirai* (KK)
KK Sengaja	Membiarkan	*ngelak*	*lak* (KK)

Awalan be-

Dalam bahasa Iban, awalan *be-* mempunyai dua fungsi yang berbeza dari fungsinya dalam bahasa Melayu. Fungsi pertamanya ialah menerbitkan kata kerja transitif yang membawa makna "perbuatan kendiri" seperti dalam perkataan *bejaku* (bercakap) dan *begambar* (bergambar). Imbuhan ini juga sangat produktif dan boleh berfungsi sebagai penetap atau merubah golongan kata. Perhatikan contoh Ayat 1 dan Ayat 2.

Ayat 1

*Jaul **bejaku** rambau Program Hari Anugerah Pengereja Pengawa Perintah (HPA) Sarawak di BCCK.* (Jaul **bercakap** ketika Program Penganugerahan Hari Perkhidmatan Awam (HPA) Sarawak di BCCK.)

Ayat 2

*Datuk Willie Mongin **begambar** kenang enggau anak Jeli Ramon*.

(Datuk Willie Mongin **bergambar** kenangan bersama anak Jeli Ramon.)

Dalam Ayat 1, perkataan *bejaku* terbentuk dengan mengimbuhkan awalan *be-* kepada kata dasar daripada kategori yang sama (kata kerja), dan tidak menggubah golongan kata; manakala, dalam Ayat 2 pula, imbuhan *be-* menukar kategori kata dari KN (gambar) kepada KK (bergambar).

Fungsi kedua awalan *be-* ini dalam bahasa Iban ialah menerbitkan kata kerja transitif aktif seperti imbuhan *meN-* dan *meN-kan* dalam bahasa Melayu (Rujuk Nik Safiah Karim et al. 2015). Kata kerja terbitan jenis ini adalah seperti *betusunka* (menyusun), *betanamka* (menanam), *berundingka* (memikirkan) dan *berjualka* (menjual).

Awalan di- dan dike-

Kedua-dua awalan ini boleh diimbuhkan kepada kata dasar yang terdiri daripada kata nama dan kata kerja, Seperti juga dalam bahasa Melayu, awalan-awalan ini berfungsi sebagai awalan pasif.

Ayat 3

*Siku pemansik ari UNIMAS begulai enggau Awang Murni enggau Awang Bima begambar ba batu pendam dipechaya **diempu** aki ini Abang Galau - siku puteri ari Brunei enggau Srikandi*.

(Seorang penyelidik dari UNIMAS bersama-sama Awang Murni dan Awang Bima bergambil di batu nisan yang dipercayai **milik** nenek moyang Abang Galau - seorang puteri dari Brunei dan Srikandi.)

Ayat 4

*Faridah madahka iya berasai temegah ati lebuh projek nya udah **dikemendar** ba taun 2019 suba.*

(Faridah memberitahu bahawa beliau berbesar hati ketika projek tersebut **diluluskan** pada tahun 2019 lepas.)

Awalan te-

Awalan *te-* boleh diimbuhkan kepada kata dasar yang terdiri daripada kata nama dan kata kerja sahaja. Awalan *te-* merupakan awalan kata kerja yang mempunyai fungsi sebagai penetap golongan kata yang membawa maksud "perbuatan tidak sengaja" dan "upaya luar biasa". Kedua-dua perkataan *terperansang* dan *terhantuk* membawa makna "perbuatan tidak sengaja".

Ayat 5

*Juyaya **teperansang** meda pemujur Melissa Francis.*

(Juyaya **terinspirasi** melihat kejayaan Melissa Francis.)

Ayat 6

*Mua tudah bisi malui mimit lalu iya madahka diri bisi pedis pegu laban **tepangka** ba batang kayu lebuh ke luput nya*.

(Wajahnya sedikit lebam lalu mangsa memberitahu dia ada mengalami kesakitan di bahagian leher disebabkan **terhantuk** pada batang kayu semasa pengsan.)

Morfem N- dan alomorf-alomorfnya

Morfem *N*- mewakili 5 alomorf iaitu /m/,/n/, /ɲ/, /ŋ dan /ŋe/. Dalam pembentukan kata bahasa Iban, alomorf atau awalan ini mengantikan fonem pertama kata dasar dan hal ini menyebabkan perubahan fungsi nahu dan makna kata yang terhasil dari proses morfologi tersebut. Memandangkan bunyi yang terlibat dalam proses ini bunyi nasal, maka proses tersebut dikenali sebagai proses penggantian penyengauan (Asmah & Rosline, 2012). Penggantian bunyi nasal ini bergantung kepada ciri fonetik bunyi pertama kata dasar. Kedua-dua bunyi yang terlibat dalam proses penggantian ini dihasilkan di daerah artikulasi yang sama atau berdekatan dalam rongga mulut. Ringkasnya, bunyi-bunyi tersebut berhomorgan. Misalnya, bunyi bilabial *b* akan digantikan dengan bunyi *m* yang juga merupakan bunyi bilabial (dua bibir) seperti dalam perkataan *pending* (dengar) digantikan dengan perkataan *mendingka* (mendengar). Alomorf *ng* (*ŋ*) yang dihasilkan di bahagian lelangit lembut (velar) akan bergabung dengan kata dasar bermula dengan bunyi *k*, manakala *ny* (*ɲ)*, bergabung dengan kata dasar bermula dengan *s* dan *ch* yang dihasilkan di daerah artikulasi gusi-lelangkit keras (alveolar-palatal). Bunyi *b* dan *p* (bilabial) pula digabungkan dengan awalan *m*-. Penggantian seperti ini juga terdapat dalam dialek Melayu Sarawak (Rujuk Salbia et al. 2024). Jadual 3 menunjukkan alomorf morfem awalan *N*- dan rumus berkaitan dengan kewujudannya dalam kata.

JADUAL 3: Alomorf morfem *N*- dalam proses Pengantian Penyengauan

Makna	**Kata Kerja**	**Kata Dasar**	**Rumus Penggantian**
Menubuhkan	***n**umbuhka*	***t**umbuh* (KK)	*n* -> *t* (alveolar)
Menunjukkan	***n**unjukka*	***t**unjuk* (KK)	
Menyimpan	***ng**irai*	***k**irai* (KK)	*ng (ŋ)* -> *k* (velar)
Menyelongkar	***ny**erungkai*	***s**erungkai* (KK)	ny (*ɲ)* -> *s (alveolar)*
Menceritakan	***ny**erita*	***ch**erita* (KN)	ch (ʧ) (palatal)
Mendengarkan	***m**endingka*	***p**ending* (KK)	m -> b, p (bilabial)
Mempamerkan	***m**antaika*	***b**antai* (KK)	

Awalan *N-* ini juga diimbuhkan kepada kata dasar tanpa melibatkan penggantian fonem (Jadual 4). Proses ini dinamakan penambahan penyengauan. Ada dua jenis alomorf nasal dalam proses ini yakni *ŋ-* dan *ŋə-*. Alomorf *ŋ-* ditambahkan pada kata dasar yang bermula dengan fonem vokal manakala *ŋə-* pula ditambahkan pada kata dasar yang bermula dengan fonem konsonan. Proses penambahan ini boleh mengubah kategori kata atau sebagai penetap golongan kata. Berikut ialah contoh penggunaan kata kerja terbitan terhasil dari imbuhan *Awalan N-*.

Ayat 7

Lagu Jayau Penyuluk Ati disadaka Frederick Bajeng siti lagu berentak 60-an ti ***nyeritaka*** *cherita entara siku bujang enggau dara ti benung nanggam pengerindu*.

(Lagu Jayau Penyuluk Ati yang dinyanyikan oleh Frederick Bajeng yang berirama 60-an **menceritakan** kisah antara teruna dan dara yang sedang dilamun cinta.)

Ayat 8

Rundi ***nunjukka*** *gamal undang kara sepengudah disumai nyadi pemakai sebedau bejadika licha Program Nupi Undang Kara di Sarawak ba sebuah hotel ditu kemari.*

(Rundi ***menunjukkan*** rupa udang kara setelah dimasak menjadi makanan sebelum merasmikan ceramah Program Memelihara Udang Kara di Sarawak di sebuah hotel tempatan semalam).

Ayat 9

Parti Rakyat Sarawak (PRS) deka ***ngirai*** *chalun baru enggau chalun indu bediri ba Pengawa Bepilih Besai Ke-15 (PRU-15) ke deka datai.*

Parti Rakyat Sarawak (PRS) ingin **menyimpan** calon baharu dan calon wanita untuk menjadi wakil di Pilihan Raya Umum ke-15 (PRU-15) yang akan datang.

Ayat 10

Atong ***mantaika*** *techal engkabang*.

(Atong **menunjukkan** bumbu engkabang).

Ayat 11

Perintah Sarawak benung ***nyerungkai*** *bemacham peluang ngambi nanggam kerejasama enggau Perintah Singapore nyengkaum sektor ti bisi pengulih*

(Kerajaan Sarawak masih **menyelongkar** pelbagai peluang untuk mendapatkan kerjasama dengan kerajaan Singapura termasuk sektor yang ada keuntungan.)

JADUAL 4: Alomorf morfem *N-* dalam proses Penambahan Penyengauan

Makna	**Kata Kerja**	**Kata Dasar**	**Proses Penambahan Penyengauan**
Menganjurkan	*ngatur*	*atur* (KN)	*ŋ (ng)* -> vokal
Menguntungkan	*nguntungka*	*untung* (KN)	
Melarikan	*ŋəlarika*	*lari* (KK)	*ŋə (nge)* -> *konsonan*
Menyematkan	*ŋəpinka*	*pin* (KN)	
Membiarkan	*ŋəlak*	*lak* (KK)	

Contoh penggunaan kata kerja yang dihasilkan dari awalan ini adalah seperti berikut:

Ayat 12

Muzium ke digaga nengah belanja beungkus RM323 juta nya deka nyungkak sektor dagang temuai sereta ***nguntungka*** *ekonomi Sarawak.*

(Muzium yang dibina menggunakan dana sebanyak RM323 juta itu akan menaikkan lagi sektor pelancong, justeru **menguntungkan** ekonomi Sarawak.)

Ayat 13

Kepala Menteri Abang Johari ***ngepinka*** *pingat ngagai Dr. Lambat*.

(Ketua Menteri Abang Johari **menyematkan** pingat kepada Dr. Lambat.)

Ayat 14

Saspek positif dadah puntan ***ngelarika*** *diri*

(Suspek positif dadah gagal melarikan diri.)

Imbuhan apitan

Jadual 5 menunjukkan contoh kata kerja terbitan yang dibentuk dari imbuhan apitan dalam bahasa Iban. Kata dasar yang menerima imbuhan apitan boleh merupakan kata kerja atau kata nama.

JADUAL 5: Imbuhan apitan

Kategori Kata Kerja	Makna	Kata Kerja	Kata Dasar
	be + kata dasar + *ka*		
KK Tidak Menyebabkan	Beralaskan	*beselapka*	*selap* (KN)
KK Kendiri	Memikirkan	*berundingka*	*runding* (KN)
KK Seketika	Melalui	*betengahka*	*tengah* (KN)
	di + kata dasar + *ka*		
KK Menyaling	Dilaporkan	*diripotka*	*ripot* (KK)
KK Memanfaatkan	Disediakan	*disediaka*	*sedia* (KK)
	di + *pe* + kata dasar + *ka*		
KK Sengaja	Dijalankan	*dipejalaika*	*jalai* (KK)
KK Sengaja	Dilepaskan	*diperlesutka*	lesut (KN)
	te + kata dasar + *ka*		
KK Tidak Sengaja	Terjumpa	*tetemuka*	*temu* (KK)
KK Tidak Sengaja	Terhidu	*tesiumka*	*sium* (KK)
	N + kata dasar + *ka*		
KK Luar Kendiri	Melarikan	*ngelarika*	*lari* (KK)
KK Luar Kendiri	Menyematkan	*ngepinka*	*pin* (KN)
KK Menghasilkan	Menguntungkan	*nguntungka*	*untung* (KN)

Apitan *be-ka*

Imbuhan *be-* apabila diimbuhkan kepada kata dasar akan menghasilkan kata kerja terbitan yang antaranya bermaksud (i) membuat dan melakukan (sesuatu) dengan orang lain, (ii) membuat dan melakukan (sesuatu) pada diri sendiri, dan (iii) membuat dan melakukan (sesuatu) sebagai kebiasaan (Asmah, 2009, hlm.142). Imbuhan *-kan (-ka* dalam bahasa Iban) pula mendukung makna (i) perbuatan manfaat, (ii) menyebabkan, dan (iii) melakukan (Asmah, 2009, hlm.151). Ketiga-tiga kata kerja terbitan yang dihasilkan dengan menambah imbuhan apitan *be-ka* dalam Jadual 5 berfungsi sebagai kata kerja transitif yang memerlukan penyambut untuk melengkapi makna ayat. Namun, jenis kata kerja ini pelbagai. Perkataan *beselapka* (beralaskan) merupakan kata kerja "perbuatan yang tidak menyebabkan sesuatu"; berundingka (memikirkan) ialah kata kerja abstrak yang menerangkan "perbuatan kendiri" dan *betengahka* turut mendukung makna "perbuatan kendiri yang mendeskripsi sesuatu keadaan atau peristiwa".

Ayat 15

Pasar tu nyadi siti palan bala mayuh ngetu sangkai sereta belelak lebuh ***betengahka*** *jalai besai Pan Borneo.*

(Pekan ini menjadi tempat orang ramai berhenti dan berehat ketika **melalui** jalan besar Pan Borneo.

Ayat 16

*Bini TYT dipebasa **bejadika** pengawa.*

(Isteri TYT dihormati untuk **merasmikan** program).

Apitan di-ka dan dipe-ka

Kedua-dua imbuhan apitan jenis ini lazimnya menandai struktur ayat pasif iaitu objek dalam ayat aktif dijadikan subjek atau inti utama dalam ayat pasif. Sebagai contoh, subjek ayat pasif dalam Ayat 17 iaitu "empat penumpang bot pelancong"pada asalnya adalah objek dalam ayat aktif "Sesorang telah melaporkan empat penumpang bot pelancong hilang."

Ayat 17

*Empat penumpang bot temuai KAZU 1 ti **diripotka** lenyau ba pantai Hokaido Jepun udah ditemu.*

(Empat penumpang bot pelancong KAZU 1 yang **dilaporkan** hilang di Hokaido Jepun sudah ditemui.)

Dalam konteks penggunaannya dalam Ayat 17, *diripotka* ialah kata kerja "perbuatan menjaling". Dalam Ayat 18, *disediaka* membawa maksud "perbuatan manfaat". Manakala, kata kerja *diperlesutka* dan *diperjalaika* dalam Ayat 19 dan 20 membawa fungsi "perbuatan yang sengaja dilakukan".

Ayat 18

*Genap nembiak **disediaka** siti kad penerang diri baka gambar, nama enggau kelas nembiak nya.*

(Setiap pelajar akan **disediakan** satu kad maklumat diri seperti gambar, nama dan kelas pelajar itu**.)**

Ayat 19

*Berebak enggau nya, raban Bomba lalu nguji ngempat tinchin indu nya ngena perengka khas lalu ngujungka tinchin ba tunjuk jari iya mujur **dikempa**t enggau **dipelesutka** ari tunjuk jari.*

(Oleh itu, pasukan Bomba mencuba memotong cincin wanita itu menggunakan peralatan khas sehingga cincin di jarinya berjaya **dipotong** dan **dilepaskan** dari jari telunjuknya.)

Ayat 20

*Proklamasi Darurat endang patut **dipejalaika** laban berundingka pengelikun enggau nyawa rayat di negeri tu ke bedau nyikap diri napi PRN ketegal pengerekai penyakit Covid-19 agi tinggi.*

(Proklamasi Darurat sememangnya harus **dilaksanakan** bagi memikirkan kesejahteraan dan nyawa rakyat di negeri ini yang belum bersedia menghadapi PRN disebabkan oleh penularan penyakit Covid-19 yang masih meningkat.)

Apitan te-ka

Seperti juga awalan *te-*, apitan *te-ka* ini berfungsi sebagai penetap golongan. Asmah (2009, hlm. 145) menyenaraikan 4 makna yang didukung oleh awalan *te-* dalam bahasa Melayu iaitu (i) tak sengaja, (ii) sudah selesai, (iii) keupayaan luar biasa, dan (iv) perbuatan sia-sia. Dalam data kajian ini, imbuhan apitan ini membawa maksud "perbuatan tidak sengaja dilakukan" seperti dalam perkataan *tesiumka* dan *tetemuka* (Ayat 21 dan 22). Dalam perkataan *tekabakka*, ia menunjukkan "perbuatan berupaya mencabut sesuatu objek" (Ayat 23).

Ayat 21

*Nitihka pansik raban Bomba, tudah tuai luput ketegal **tesiumka** bau rachun rumput ti dikena iya manchit sehari nya.*

(Berdasarkan pemerhatian pihak Bomba, mangsa pengsan disebabkan **terhidu** bau racun yang digunakannya meracun pada hari tersebut.)

Ayat 22

*Nitihka penerang ari Balai Bomba enggau Penyah Penusah (BBP) Betong, dua iku raban sida , PB Nickson Asean Akui enggau PBB Antonio Bagio Salleh **tetemuka** Sebastian Jelani benung gali gegaring enda ngeleda dia.*

(Menurut keterangan dari Balai Bomba dan Penyelamat (BBP) Betong, dua anggotanya, PB Nickson Asean Akui dan PBB Antonio Bagio Salleh **menemui** Sebastian Jelani yang dalam keadaan terbaring tidak sedarkan diri.)

Ayat 23

*Ribut kudi nya bepusin baka biau balai ngujungka perabung rumah aku **tekabak**.*

(Angin kencang itu berpusing seperti puting beliung mengakibatkan bumbung rumah saya **tercabut**.)

Apitan N-ka

Seperti awalan *N-*, apitan *N-ka* ini sangat produktif dalam bahasa Iban. Apitan ini turut mempunyai fungsi sebagai penetap dan juga pengubah golongan kata, dan boleh diimbuhkan kepada kata kerja dan kata nama. Dalam Ayat 24, *ngepinka* berfungsi sebagai kata kerja transitif yang memerlukan dua pelengkap iaitu *pingat* dan *Dr. Lamat*. Rujuk juga Ayat 7, 8 dan 10.

Ayat 24

*Kepala Menteri Abang Johari **ngepinka** pingat ngagai Dr. Lambat.*

(Ketua Menteri Abang Johari **menyematkan** pingat kepada Dr. Lambat.)

Akhiran -ka

Hanya satu imbuhan akhiran ditemui dalam data kajian ini iaitu *-ka*. Sepertimana yang sudah dinyatakan, imbuhan *-ka* membawa maksud "perbuatan manfaat", "menyebabkan" dan "melakukan". Apabila diimbuhkan kepada kata dasar, akhiran *-ka* akan menghasilkan kata kerja transitif yang memerlukan penyambut untuk melengkapi ayat. Misalnya, *Dia menidurkan anaknya.* Kata kerja terbitan *menidurkan* memerlukan objek *anaknya* sebagai penyambut. Jadual 6 menunjukkan beberapa contoh kata kerja dengan akhiran *-ka* yang terdapat dalam bahasa Iban.

JADUAL 6: Akhiran *-ka*

Kategori Kata Kerja	**Makna**	**Kata Kerja**	**Kata Dasar**
KK Luar Kendiri	Mempercayai	*pechayaka*	*pechaya* (KK)
KK Sengaja	Menceritakan	*nyeritaka*	*cherita* (KN)
KKTidak Memanfaatkan	Mempamerkan	*mantaika*	*bantai* (KK)
KK Kendiri	Menghentikan	*ketuka*	*ketu* (KK)
KK Sengaja	Mendengarkan	*mendingka*	*pending* (KK)
KK Sengaja	Menubuhkan	*numbuhka*	*tumbuh* (KK)
KK Sengaja	Menunjukkan	*nunjukka*	*tunjuk* (KK)

Ayat 25

*Royston **pechayaka** penau raban nembiak nyadi tuai.*

(Royston mempercayai bahawa kebolehan generasi muda menjadi ketua.)

Ayat 26

*Diumba ke ati majak gidan **mendingka** pengelunak tiun sape nya, dia dih penanyi ke berumur 43 taun tu lalu meli sebuah sape ungkup diri empu"*

(Disebabkan minat **mendengarkan** kemerduan bunyi sape, penyanyi yang berusia 43 tahun itu membeli sebuah sape untuk dirinya sendiri.)

Dalam Ayat 25, klausa *penau raban nembiak nyadi tuai* merupakan pelengkap kepada kata kerja *pechayaka*, manakala dalam Ayat 26, pelengkap kepada kata kerja *mendingka* ialah *pengelunak tiun sape nya*.

PERBINCANGAN

Tumpuan bab perbincangan ini adalah untuk merumuskan dapatan kajian ini dan membuat perbandingan imbuhan-imbuhan kata kerja dalam bahasa Melayu dengan bahasa Iban. Jadual 7 memberi rumusan perbandingan imbuhan kata kerja dalam kedua-dua bahasa ini. Imbuhan-imbuhan bahasa Melayu yang disenaraikan dipetik dari Asmah (2009) dan Nik Safiah et al. (2013). Manakala imbuhan-imbuhan dari bahasa Iban dipetik dari Asmah (2013, 2012) dan Chong (2021). Hampir kesemua imbuhan kata kerja yang

terdapat dalam bahasa Melayu juga terdapat dalam bahasa Iban berdasarkan data bahasa pertuturan dan laras formal.

Imbuhan kata kerja dalam bahasa Iban sudah semakin rencam seiring dengan perkembanganya sebagai bahasa ilmu dalam pelbagai domain. Apabila bahasa Iban diperluaskan fungsi penggunaannya dalam domain ilmu yang lain, sudah tentu menuntut lebih banyak penggunaan imbuhan yang kompleks. Walaupun kajian ini hanya bersumberkan teks berita, namun dapatan kajian menunjukkan perkembangan yang pesat dalam penggunaan imbuhan bahasa Iban dalam bahasa formal.

JADUAL 7: *Perbandingan imbuhan kata kerja bahasa Melayu dengan bahasa Iban*

Imbuhan Bahasa Melayu	Imbuhan Bahasa Iban
di-	*di-*
meN-	*me-; N-*
-	*en-*
ter-	*te-*
ber-	*be-*
se-	*se-*
per-	*pe-*
-	*beke-*
-	*bete-*
-kan	*-ka*
-i	-
men-i	-
memper-i	-
memper-kan	*me-ka; N-ka*
memper-	
di-kan	*di-ka*
diper-kan	*dipe-ka*
diper-i	-
diper-	-
di-i	-
ber-kan	*be-ka*
ke-kan	*ke-ka*
ke-an	-
te-kan	*te-ka*
te-i	-

Perbandingan imbuhan kata kerja bahasa Iban yang menggunakan data di lapangan berbeza dari teks formal. Jika dibandingkan dengan dapatan kajian Asmah (2013/1969) yang berasaskan data dari informan (bahasa pertuturan), jelas perbezaan di antara bahasa lisan dan tulisan dalam penggunaan imbuhan. Imbuhan seperti *me-, ke-ka, beke, bete, en-,* dan *se-* kurang digunakan dalam laras bahasa formal. Imbuhan-imbuhan ini lebih cenderung digunakan dalam laras cerita rakyat atau komunikasi lisan. Misalnya, e*nchelak* (membuka mata), *tinggi-setinggi* (semakin tinggi), *mereti* (berkelakuan baik), *kemataka* (perhatikan),

bekesebar (lari bertempiaran) dan *bekebesur* (lalu-lalang). Data Asmah (2013/1969) tidak memperlihatkan adanya imbuhan *N-ka, be-ka* dan *dipe-ka* kerana data yang digunakan oleh beliau diambil daripada cerita rakyat dan temu bual bersama penutur jati bahasa Iban. Dalam gaya bahasa formal seperti dalam teks berita, imbuhan-imbuhan yang dibincangkan oleh Asmah (2013/1969) seperti *se-, en-, bete-* dan *beke-* tidak ditemui.

Secara keseluruhannya, dari segi fungsi dan makna kata kerja yang diterbitkan, imbuhan-imbuhan dalam bahasa Iban ini mempunyai banyak persamaan dengan bahasa Melayu seperti yang sudah dijelaskan terperinci dalam dapatan kajian. Hal ini sudah dijangkakan kerana pertalian kekeluargaan antara kedua-dua bahasa ini. Kedua-duanya tergolong dalam keluarga bahasa Malayik (Asmah & Norazuna, 2020). Bagi mentranformasi bahasa pertuturan kepada bahasa tulisan, bahasa Iban seperti bahasa-bahasa yang lain di dunia harus juga meminjam daripada bahasa-bahasa yang sudah lama bertapak sebagai bahasa tulisan. Sudah nampak peningkatan penggunaan imbuhan kata kerja yang kompleks dalam bahasa Iban bagi memenuhi tuntutan gaya bahasa tulisan yang sebelum ini tidak diperlukan dalam bahasa pertuturan. Namun, fungsi dan makna sesetengah imbuhan tersebut masih belum pelbagai sepertimana penggunaannya dalam bahasa Melayu.

Sepertimana yang telah dinyatakan di awal perbincangan, kesemua imbuhan kata kerja yang ditemui dalam teks berita ini sangat produktif kerana mempunyai pelbagai fungsi nahu. Imbuhan ini dikatakan produktif juga kerana dapat digabungkan dengan kata jati bahasa Iban, dan bukan hanya terhad kepada bahasa Melayu. Ada kemungkinan berlaku peminjaman imbuhan melalui peminjaman kata dari bahasa Melayu terutama bagi mengungkap konsep-konsep baru. Imbuhan-imbuhan tersebut turut diperluaskan maknanya untuk menerbitkan kata terbitan baru dalam bahasa Iban seterusnya memperkayakan perbendaharaan katanya. Jadual 8 menunjukkan beberapa contoh perluasan penggunaan imbuhan ini dalam kosa kata jati bahasa Iban. Selain daripada bahasa Melayu, bahasa Iban juga meminjam kata dasar dari bahasa Inggeris seperti dalam perkataan *ngepinka* dan *diripotka*.

JADUAL 8: Kata kerja jati bahasa Iban

Kata Kerja Selapis		**Kata Kerja Dua Lapis**		**Kata Kerja kompleks**	
laya	gaduh	*belaya*	bergaduh	*belayaka*	bergaduh
jaku	kata	*bejaku*	bercakap	*dikejakuka*	diperkatakan
lelak	penat	*belelak*	berehat	*ngelelakka*	memenatkan
banchak	tikam	*dibanchak*	ditikam	*dibanchakka*	ditikami
tusun	susun	*ditusun*	disusun	*betusunka*	menyusun
empu	milik	*diempu*	dimilliki	*beempuka*	berempunya
kabak	cabut	*tekabak*	tercabut	*tekabakka*	berdaya
selap	alas	*diselap*	dialas	*beselapka*	beralaskan
tengah	lalu	*ditengah*	dilalui	*betengahka*	melalui
ripot	lapor	*ngeripot*	melapor	*diripotka*	dilaporkan
pin	pin	*dipin*	disemat	*ngepinka*	menyematkan
bantai	pamer	*dibantai*	dipamer	*mantaika*	mempamerkan
ketu	henti	*ketuka*	hentikan	*diketuka*	dihentikan
mending	dengar	*mendingka*	mendengarkan	*dipendingka*	didengari
kirai	kering	*ngirai*	mengeringkan	*dikiraika*	dikeringkan

Dari segi fungsi dan makna kata kerja terbitan yang dihasilkan, imbuhan-imbuhan dalam bahasa Iban mempunyai persamaan dengan bahasa Melayu. Proses-proses morfofonemik seperti homorganik nasal yang berlaku dalam gabungan morfem *meN-* dengan kata dasar bahasa Melayu turut berlaku dalam gabungan *morfem N-* dengan kata dasar dalam bahasa Iban. (Rujuk Jadual 3 dan 4).

Namun, ada juga proses morfologi yang masih dipertahankan dalam gaya bahasa Iban formal. Proses penggantian penyengauan (Jadual 3) masih dipertahankan walaupun ia merupakan ciri bahasa pertuturan, seperti juga ditemui dalam dialek Melayu Sarawak (Rujuk Salbia et al. 2024). Makna dan fungsi imbuhan awalan *be-* dan akhiran *-ka* turut mempunyai sedikit perbezaan dan aspek penggunaan imbuhan ini perlu dikaji secara terperinci dengan data yang lebih komprehensif.

KESIMPULAN

Sebagai rumusannya, kajian ini serba sedikit memperlihatkan perkembangan dan kemajuan bahasa Iban dalam transformasinya dari bahasa pertuturan kepada bahasa tulisan. Dalam proses tersebut, berlaku peminjaman dari bahasa Melayu, namun tidak sepenuhnya. Bahasa Iban turut mengekalkan ciri linguistiknya tersendiri. Untuk sesuatu bahasa itu berkembang, seharusnya berlaku adaptasi dan peminjaman supaya bahasa itu mampu bertahan dan diperluaskan penggunaannya.

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Ethnomedicinal and Ethnopharmacology Value of Plants Used by Kenyah in Borneo: A Review

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ABSTRACT

Numerous societies across the globe rely on medicinal plants as a primary therapeutic resource. These plants have a long history of use in traditional medicine among several indigenous communities in Borneo. Among these communities is the Kenyah, who have an extensive heritage of relying on plants for medicinal purposes. The purpose of this review is to examine and compile the ethnomedicinal utilisation of plants by the Kenyah people of Borneo. This review included and documented different plants used by the locals of Borneo particularly Kenyah of Kalimantan and Sarawak for various medicinal purposes. The plants are grouped into family name, scientific name, and local name. Tabulation of each plant's specific treatment remedy after the method of administration, which may involve crushing and drinking an infusion, applying a poultice externally, grinding the plant into a paste, or inhaling smoke were done. The documentation identified 61 plant families, and several traditional treatment groups. Selected plants are scrutinized for their existing data on traditional usage to determine further potential and research gaps for research of the plants relating with the Kenyah ethnomedicinal knowledge.

Keywords: Ethnomedicinal; Ethnopharmacology; Kenyah; Sarawak; Kalimantan

INTRODUCTION

Traditional medical practices and their application across many cultural and geographical settings are the primarily the ethnomedicinal study (Quinlan, 2022). In traditional ethnomedicine, knowledge is passed down orally from one generation to the next by means other than written documents (Y. Zhang et al., 2014). Despite the availability of basic and supplementary healthcare, traditional medicines are still commonly utilised to treat minor diseases such as colds, fevers, stomach issues, and headaches to major diseases such as cancer, broken bone and reproductive issues (Aziz et al., 2020). The society's traditional remedies ought to solely be administered by skilled traditional healers or elders.

The preference for the traditional ethnomedical system for some illnesses is probably due to its availability, efficacy, and particularly affordability compared to biomedicine, and conventional treatment is culturally more acceptable (Bakar et al., 2023). This demonstrates how local traditional knowledge may help alleviate a wide range of healthcare issues in rural and urban communities by supplementing technological therapy with conventional remedies (Gomes et al., 2023). Worldwide, medical usage trends and practices are influenced by many cultures and lifestyles. According to Süntar (2020), traditional understandings and the geographical distribution of plant species can impact the methods used to manufacture medications and plant sections. Understanding the variety of medicinal plants requires research on these factors. Furthermore, many trends, most notably urbanization and globalization, have had a detrimental impact on traditional wisdom.

For a long time in Borneo, people of indigenous descent have relied on herbal remedies to treat and prevent a wide range of diseases. The Kenyah Dayak tribe is a Dayak tribe that includes the Kenyah, Kayan, and Bahau group that originates from Baram district, Sarawak (Sagala et al., 2020). From that region the Kenyah tribe entered Malinau Regency, East Kalimantan through the river in Iwan Sarawak, split into two parts towards the Apau Kayan area which was previously occupied by the Kayan tribe and the other part towards Bahau. They are also a native Malaysian ethnic group well-known for their extensive knowledge of and practice with a wide range of herbal remedies (Khan et al., 2023). Research on the ingredients and methods of preparation of these medicinal plants is crucial for understanding the Kenyah people's long-standing usage of these plants in healing, as well as their traditional therapies.

Traditional medicine among Malaysia's Kenyah community dates back thousands of years (Sundara Rajoo et al., 2023a). In order to cure injuries including wounds, burns, and infections, the Kenyah folks use a wide range of medicinal herbs, according to a recent study (Khan et al., 2023). These herbal remedies are also used by the Kenyah folks to alleviate gastrointestinal issues, lower fevers, and promote healthy skin, according to the study. There is potentially a strong connection between the spirituality and cultural traditions of the Kenyah community and the utilization of medicinal plants in traditional medical procedures. An analysis also revealed that studies are conducted in a few districts of Sarawak, primarily focusing on Iban, Kedayan, Melanau, Bidayuh, Orang Ulu (Kenyah and Kayan), and Jagoi communities suggesting that the utilization of herbal plants by other communities and regions are yet to be recognized, published or the data is not presented online (Bakar et al., 2023).

Research into the Kenyah's ethnomedicinal plants, including their chemical make-up and their therapeutic uses, is crucial for understanding their traditional medicine and the plants' effects on human health. In addition to protecting the Kenyah people's rich cultural heritage and body of knowledge, this data may lead to the discovery of novel medicinal and therapeutic agents. Therefore, for the benefit of rural communities and for the advancement of medicine, it is critical to record traditional knowledge in order to preserve it. In general, the development of novel medications relies heavily on traditional ethnobotany knowledge (Süntar, 2020). Yet, there are a number of drawbacks to relying on plants for traditional medicine. These include issues with efficacy, dosage uncertainty, diagnostic difficulties, and the availability of plant species, which can change over time. The goal in conducting this review was to elucidate the diversity of medicinal plant utilization by the Kenyah indigenous community for health care reasons in the study area. As a result, there is ample potential for additional research into the fields of ethnobiology, ethnopharmacology, and ethnobotany of these plants through investigating the connection between human cognition and communication of Kenyah people’s history.

METHOD AND APPROACHES

Data Sources and Search Strategy

This study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methods to the extent in order to reach the objective of the systematic study (Page et al., 2021). Due to its widespread use and acceptance in systematic reviews, this procedure was chosen to provide a systematic and comprehensive approach to data collection, analysis, and presentation. The study was supplemented by a systematic review-specific evaluation criteria checklist to further ensure high quality, transparency, and reproducibility (Duche-pérez et al., 2024). To guarantee that the review was carried out in a thorough and rigorous manner, these criteria were essential.

Google Scholar, Web of Science, Scopus, Springer, and PubMed were among the more specific databases that were thoroughly searched throughout the process. We selected these databases because of the wealth of internationally recognised scientific articles they include and the breadth of their coverage. To ensure that the included studies were up-to-date and pertinent to the research issue, the search concentrated on finding publications published in high-impact scientific journals. Despite extensive searching, no previous systematic evaluations were located that dealt with the documentation and therapeutic applications of Kenyah ethnomedicinal knowledge. Thus, relevant information was collected through a literature survey of the published Kenyah ethnobotanical papers on herbal medicines found in the Kalimantan and Sarawak regions of Borneo. The significance of this discovery in addressing this gap in the existing scientific literature highlights the uniqueness and necessity of the current review.

This study is based on a research topic that asks: What is the health-related theories, knowledge, therapeutic value of medicinal plants documented the Kenyah, and how have their ethnopharmacological applications been evaluated in the scientific literature? The following terms and their related concepts were used in the search process: ethnomedicine (Kenyah medicine, cultural medicine, folk medicine, indigenous medicine, natural medicine, traditional herbal medicine, traditional medicine) and medicinal plants (curative plants, healing herbs, healing plants, herbal medicine plants, herbal remedies, medicinal botanicals, medicinal flora, medicinal herbs). The lookup was completed in both English and Malay. Here, the search equation included both predefined terms and free-form ones: (Kenyah OR ethno OR ancestral OR culture OR folk OR indigen OR natural OR tradition) + (plant OR herb OR flora OR botanic).

Inclusion and Exclusion Criteria

Articles published in peer-reviewed scientific journals between 2014 and 2024 and indexed in databases such as PubMed, Springer, Scopus, and Google Scholar (Core Collection) were the only ones included for the systematic review. In the context of ethnomedicine, ethnobotanical surveys were carried out in Borneo, Sarawak, and Kalimantan pertaining to Kenyah, and these studies were published in English and Malay and dealt with subjects including documentation, evaluation, and pharmacology of the medicinal plants. In order to ensure that the articles were relevant to the review objectives, they were additionally selected based on whether they included terms related to "ethnomedicine" (such as Kenyah medicine, cultural medicine, folk medicine) or "ethnopharmacology" (such as chemical constituent, antioxidant, pharmacology, clinical studies) in their abstracts or descriptors. In the ethnopharmacology table, only the chemical constituent from the utilized part of the plant by Kenyah people are cited such as Hibiscus rosa-sinensis is mainly reviewed for the data of its flower but the leaves are the applied part to treat pus urine according to a Kenyah ethnomedicinal studies so only the chemical constituent of the leaves are tabulated. The pharmacological studies row in the table is included for studies generally done *in vitro, in silico* and *in vivo* relating to the traditional use of Kenyah yet for plants with limited data or studies, the available pharmacology is added. The clinical trial part is inserted with any available data related to the utilization of the plant as a whole in the study. Notably, some of the evaluated studies omitted vital ethnobotanical facts on plant folk names,

informants, research site selection criteria, remedy preparations, ICPC-2 categories and administrations, among other things.

Studies were also excluded if they did not fulfil the aforementioned criteria. Papers such as this fall under this category, as do conference abstracts, initial research, editorials, and letters to the editor. Excluded from the search were studies authored in languages other than English and Malay, as well as those published between 2014 and 2024. Furthermore, publications published in platforms or forums other than scholarly journals were also not included, nor were research that did not centre on ethnomedicine or ethnopharmacological applications of the linked medicinal plants. This includes ethnoveterinary use in particular. For the ethnopharmacology table, the chemical components are excluded with quercetin, gallic acid and kaempferol as an additional row is added for antioxidant DPPH test proven the existence of the aforementioned chemical constituent. Therefore, the focus is more on detailed chemical compound that is isolated from the plant that may contribute not only to antioxidants but other pharmacological and biological activities.

Finally, to ensure that only high-quality and relevant research was included in the review, studies that were duplicated or overlapped were excluded, as were studies that did not give adequate detail on the evaluation, documentation, or conservation of ethnomedicinal knowledge.

Document Selection Procedure

Before settling on a final set of publications, the researchers underwent a multi-step process. The initial step in selecting articles was for four separate writers to manually review the titles and abstracts of relevant journal publications. Other writers looked over all of the papers that might have qualified. In the event of disagreement, the view of a third author was taken into account. In Figure 1 we can see the steps used to choose the data. Out of the 136 papers that were retrieved using various search engines, 41 did not provide enough detail. From this pool, 95 documents were chosen for this review's design, and all of them met the inclusion and exclusion criteria.

Data Analysis

It was considered crucial to create a table that compiled important data as this review requires a higher degree of specificity. There were three figures and two tables that summarised the data: one for ethnomedicine and another for ethnopharmacology. The tables for ethnopharmacology also included the phytochemistry of the plants that were described. There is information on the plant's name, family, vernacular name, traditional usage, parts used, extraction methods, indication, and survey area in the ethnomedicinal table (Aziz et al., 2020; Jarić et al., 2024). The ethnopharmacology table contains information about the plant's common or regional name, its primary chemical component, its antioxidant capacity, its pharmacology, its clinical trials, and its claimed traditional usage. In addition, a comparison analysis was carried out among the chosen studies to enhance the analysis. The data was tabulated, sorted, and organised in MS Excel for cross-regional study of medicinal taxa and their usage. Then, Venn diagrams and charts were used to present the results. This allowed for the identification of noteworthy parallels and differences in the techniques and conclusions reported in the literature review. A greater grasp of patterns and trends in Kenyah ethnomedicinal research is made possible by this all-encompassing method, which also helps with data organisation and analysis.

SCOPE AND LIMITATION

Traditional Medicines of Borneo

A total of 95 documents were chosen for inclusion in the sample once the search was finished and the results were reviewed using the defined technique. Table 2 lists the ethnopharmacology, pharmacology, chemical constituents, and clinical research conducted on ethnomedicinal plants from Kenyah in Borneo, and Table 1 lists the ethnomedicinal plants of Kenyah in Borneo. Furthermore, it was sought out 30 medicinal plant species to study their phytopharmacological profiles. Table 2 is provided with the main chemical components of selected plants with significant to Kenyah ethnomedicine such as cross cited in previous literature or highly cited by respondent in articles. These tables were used to organise and categorise the objects being studied.

The Kayan and Kenyah

Located in the inner highland woods of Kalimantan (Indonesian) and Sarawak (Malaysian) both in Borneo, the Kenyah are agrarian community (Leaman et al., 1995). On the plateau that connects the Kayan and Mahakam rivers, known as the Apo Kayan, about 8,000 Kenyah people live in longhouse populations. They grow rice by shifting cultivation and depend heavily on forest resources for subsistence hunting, fishing, and gathering. In furtherance of their own understanding of local resources, the Kenyah have limited access to medicines, as do many groups in comparatively far and inaccessible regions.

In Sarawak Bintulu, the upper Tubau River, which is a tributary of the Kemena River, is home to the Kenyah people. Numerous Kenyah settlements can be found downstream the Kakus, a tributary of the Tatau River. Statistics showed that there were 230,000 people living in Bintulu Division in 2010 (石川登, 2013). Of the total population, just 5% are Orang Ulu, which includes the inland Kayan and Kenyah peoples.

Kenyah Kalimantan Ethnomedicine

In Kalimantan, the types of infectious diseases that has been recorded for example Malaria, panu or water lice, infectious wounds (purulent), diarrhoea, toothache, urinary tract infections, worms, eye pain and more are noted in Table 1. Diarrhoea occupies the first position of the infectious disease most often experienced by the Kenyah Dayak Tribe community (Setiawan & Hazyrul, 2022). This may be due to the condition of the community which is still lacking in paying attention to the cleanliness of the environment where they live. There are still many people who live with dogs and there are people who keep pigs, where the pigsty is very close to their homes.

Six ways of processing medicinal plants that are commonly done by the Kenyah Dayak tribe, namely, boiling with a percentage of 46%, pounded with a percentage of 18.18%, dripped with a percentage of 13.63%, burned and brewed with a percentage of 9% (Setiawan & Hazyrul, 2022). Then there are 2 main sources of income for the Dayak Kenyah community in obtaining medicinal plants used for the treatment of infectious diseases, namely, the cultivation (farm) of medicinal plants amounting to 9.10% while medicinal plants obtained from wild habitats (forests) amount to 90.90% (Imang et al., 2008).

The traditional medicine of the Kenyah Dayak Sub-tribe of Umaq Bekuai Village, Tabang, Kutai Kartanegara, Kalimantan that are most commonly used in the families of Acanthaceae, Compositae, and Euphorbiaceae. (Acanthaceae (49%), followed by Compositae (30%), Euphorbiaceae dan Poaceae masingmasing (10%) and others (1%)) (Az-Zahra et al., 2021). Native Kenyak Dayaks make Pupur, a medicinal plant paste, by boiling, crushing, drinking, and applying it to sore spots. *Graptophyllum pictum* (Kemba) and *Justicia gendarussa* (Kembat) are members of the Acanthaceae family; Tumbuh Daging is a

member of the same family and is used to treat bloody faeces (Sagala et al., 2020). The decocted leaf water of V*ernonia amygdalina* (Udo Lepek) can be used to cure diabetes, while the hormonal menstruation can be alleviated by *Ageratum conyzoides* (Tambora). *Tagetes erecta* (Bunga Saret Batak) can be used to treat coughs that are full of phlegm. Using the decocted leaf water, fractures can be treated with *Euphorbia tithymaloides* (Patah Tulang), while rheumatic disorders can be treated with *Excoecaria cochinchinensis* (serat merah) (Sagala et al., 2020). Accordingly, it was found that there is a potential anti-cancer plant, namely Bekai (*Pycnarrhena cauliflora* Diels), which needs to be further researched on the chemical content found in the plant (Sagala et al., 2020). Interestingly, *Pycnarrhena tumefacta* Miers was also reported to be called bekai locally but used for eye sore instead of cancer with a different indication (Setiawan & Hazyrul, 2022). The Kenyah of the Apo Kayan, a remote forested plateau in Indonesian Borneo, use 17 malaria remedies derived from natural sources (Leaman et al., 1995). A study reported with results that confirm the selection and use of traditional remedies for malaria by the Kenyah.

Furthermore, it can be known that members or species of plants from the Family Zingiberacea have the most amount utilized by the Dayak community in Long Nawang Village (Ingan & Jaya, 2023). In addition to plants from the Family Zingiberaceae, more than one species of plants from the Family Poaceae, Piperaceae, and Liliaceae are used by the Dayak Kenyah tribe for medicines and spices. For the rest, each of the recorded families has only one species of plant that is used either for medicine only, for spices only, or for both. One of the interesting information from the results of this research is that the family Zingiberaceae has members of the species that are used the most by the Dayak Kenyah tribe compared to members of other families as is also done by the Dayak tribes in other regions, both fellow Dayak Kenyah tribes as well as the Dayak Lundayeh tribe (Ingan & Jaya, 2023; Listiani & Abrori, 2019; S. A. Maharani et al., 2021; Setiawan & Hazyrul, 2022). Plants from the Family Zingiberaceae are widely used as medicines and spices by people in Indonesia because they contain chemical compounds that are beneficial for the body as a general essential oils, saponins, flavonoids, and polyphenols (Ingan & Jaya, 2023).

Family Poaceae and Piperaceae also have quite a role for the Dayak Kenyah tribal community as also found in the Tidung tribal community (Listiani & Abrori, 2019). This plant from the Family Poaceae and Piperaceae has benefits as a medicinal ingredient as well as a spice ingredient. Bambusa vulgaris is one of the plants from the Poaceae family that is used as a medicine by the Dayak Kenyah, Dayak Mahap, and Malay tribes (S. A. Maharani et al., 2021). It is known that the medicinal plant that is often used by the Kenyah Dayak tribe for the treatment of infectious diseases namely bekai with a percentage of use of 12%, then soursop (Dian kapen) of 8%. The bekai plant is used by the Kenyah Dayak tribe to treat red eyes and often remove eye dirt (Sepsamli et al., 2019). Research shows that general flavonoid compounds, alkaloids, tannins, and phenols can inhibit bacterial growth by interfering with cell wall components, metabolism, and DNA-RNA synthesis (Ulfa et al., 2021). As the leaves containing the flavonoid chemicals, alkaloids, tannins, and phenolics, bekai leaves used to treat eye pain may limit bacteria development.

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TABLE 1: Kenyah Ethnomedicinal Plants in Borneo

Family name	Name of herb	Local name	Disease specified or use categories (ICPC-2)	Plant part	Extraction methods and indication	Reference
Lamiaceae	*Orthosiphon aristatus* (Blume) Miq.	Misai Kucing/ Kumis Kucing	Diabetes stomach-ache Kidney stones	Leaves	Boiled and water is consumed twice a day.	(Ingan & Jaya, 2023; Khan et al., 2023; Sagala et al., 2020; Sundara Rajoo et al., 2023a)
	Leuconotis eugeniifolia	Senudung	Bloated stomach (baby only)	-	-	(Khan et al., 2023)
	Vitex pinnata L.	-	Eye	Leaves	Boiled and water is applied on affected area	(Sundara Rajoo et al., 2023a)
	Vitex pubescens	-	Eye	Leaves	Boiled and water is applied on affected area	(Sundara Rajoo et al., 2023a)
	Callicarpa longifolia Lam.	-	Skin	Leaves	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
Zingiberaceae	*Curcuma longa*	Kunyit/Lia mit/ Le berung	Diarrhoea Malaria	Roots, Fruit added with honey	Powdered, boiled with tea/water, and consumed. Take enough turmeric, wash it clean and then grate it, add water, and drink it. When added honey can treat malaria.	(Ingan & Jaya, 2023; Setiawan & Hazyrul, 2022; Sundara Rajoo et al., 2023b)
	Kaempferia galanga	Kencur/Lia sanit	Digestive, Cardiovascular, Respiratory	Root	Boiled and water is consumed	(Ingan & Jaya, 2023; Sundara Rajoo et al., 2023a)

	Zingiber officinale	Jahe/Lia buke/Liasa lok	Diarrhoea Malaria	Fruit added with honey	Take enough turmeric, wash it clean and then grate it, add water and drink it. When added honey can treat malaria. To be taken 3 times per day	(Ingan & Jaya, 2023)
			Skin	Root	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
	Alpinia galanga L.	Lengkuas/ Bukek/ Burak	Skin panu/water lice	Fruit	Take enough fruit, wash it clean, then mash it until smooth and apply it on the skin.	(Setiawan & Hazyrul, 2022)
Caricaceae	*Carica papaya*	Pepaya/Manjan	Diarrhoea, Skin	Leaves	Take 4-5 leaves, wash them clean, then boil them, filter and drink. Honey can be added to reduce the bitter taste. Drink three times a day	(Ingan & Jaya, 2023; Setiawan & Hazyrul, 2022; Sundara Rajoo et al., 2023a)
Piperaceae	*Piper betle*	Sirih/ Kudu Sepak	Sore throat Toothache Eye, Neurological, Respiratory	Leaves	Take 4-5 kudu sepak leaves, wash them clean, then boil the kudu sepak leaves until they change color, let it cool down, add	(Ingan & Jaya, 2023; Sagala et al., 2020; Setiawan & Hazyrul, 2022; Sundara Rajoo et al., 2023a)

					salt and rinse using the kudu sepak water. Gargled 3 times a day or drink 2 times a day. Boiled water is also used for bath.	
	Piper nigrum L.	-	General and Unspecified	Fruit/ Seed	Boiled and water is consumed or bathed with.	(Sundara Rajoo et al., 2023a)
Aristoloceae	*Aristolochia foveolata*	Taban aka	-	-	-	(Ingan & Jaya, 2023)
Annonaceae	*Annona muricata*	Sirsak/Dian Kapen	Digestive, Cardiovascular, Respiratory, Endocrine/Metabolic and Nutritional Worms	Leaves	Pounded and applied on affected area. Take 7-8 leaves, wash clean and then boil until the boiled water turns greenish. Drink 3 times a day	(Ingan & Jaya, 2023; Setiawan & Hazyrul, 2022; Sundara Rajoo et al., 2023a)
	Goniothalamus macrophyllus (Blume) Zoll.	-	Skin	Stem and roots	Burned like incense and applied on body	(Sundara Rajoo et al., 2023a)
	Phaeanthus sp.	-	Skin	Kebin (other)	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
	Polyalthia spp.		Skin	Leaves	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
Arecaceae	*Cocos nucifera*	Kelapa	Respiratory and skin	Fruit	Pressed to produce oil,	(Ingan & Jaya, 2023; Sundara Rajoo et al., 2023a)

					applied on affected area	
Poaceae	*Bambusa vulgaris*	Bambu	-	-	-	(Ingan & Jaya, 2023)
	Cymbopogon citratus	Serai	-	-	-	(Ingan & Jaya, 2023)
	Panicum sp.	Rumput Jalar	For back pain	Leaves	First cleaned and then boiled. Drink once a day	(Sagala et al., 2020)
	Imperata cylindrica (L.) Raeusch.	Alang-alang	For bone pain, Neurological	Root	Boiled in four glasses of water make two glasses. Then drink it twice a day	(Sagala et al., 2020; Sundara Rajoo et al., 2023a)
	Giganthochloa spp.	-	Skin	Leaves	Leaves are used to wrap around affected area	(Sundara Rajoo et al., 2023a)
	Pennisetum purpureum (Schumach.) Morrone	-	Skin	Leaves	Squeezed and applied on affected area	(Sundara Rajoo et al., 2023a)
	Cymbopogon nardus (L.) Rendle	-	Musculoskeletal, Neurological, Urological	Stem and leaves	Pounded and boiled, water is consumed or bathed with	(Sundara Rajoo et al., 2023a)
	Saccharum officinarum L.	-	Respiratory, Urological	Leaves	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
Asphodelaceae	*Aloe vera*	Lidah buaya	Skin	Leaves	Leave extract is applied on affected area	(Ingan & Jaya, 2023; Sundara Rajoo et al., 2023a)
Rutaceae	*Citrus* sp.	Bunyau/Jeruk purut	-	-	-	(Ingan & Jaya, 2023)
	Citrus aurantifolia L.	Jeruk nipis/Meo	Panu/Kutu Air Respiratory, skin	Fruit	Take enough lime fruit, then burn it and wash	(Setiawan & Hazyrul, 2022;

					it until it is clean. Mash it finely and apply it on the skin that has panu/water lice. Fruit can consumed directly	Sundara Rajoo et al., 2023a)
Liliaceae	*Allium cepa*	Bawang merah	-	-	-	(Ingan & Jaya, 2023)
	Lilium longiflorum Thunb	Bunga Paskah/Bakong	A suppurating wound	Leaves	Take 7-8 leaves, wash clean, mash until smooth and apply to the infected skin.	(Setiawan & Hazyrul, 2022)
Iridaceae	*Eleutherine bulbosa*	Udo Lembak (Bawang Dayak)	Amandel/Tonsils	Rhizome	Clean the rhizome then grate and filter. Drink 2 times a day	(Ingan & Jaya, 2023; Sagala et al., 2020)
Myrtaceae	*Psidium guajava*	Daun Jambu/ Jambu/Nyi bun	Diarrhoea	Leaves	Cleaned first then grated and drink once a day/Take 10 sheets of nyibun leaves, wash them clean, then boil the nyibun leaves until they turn greenish, then strain and drink. Drink three times a day.	(Ingan & Jaya, 2023; Sagala et al., 2020; Setiawan & Hazyrul, 2022; Sundara Rajoo et al., 2023a)
	Syzygium fergusonii (Trimen) Gamble		Skin	Leaves	Leaves are used to wrap around affected area	(Sundara Rajoo et al., 2023a)

Menispermaceae	*Pycnarrhena cauliflora* Diels	Bekai	For Cancer and Flavoring	Leaves	Boiled and then drink 3 times a day/put into cooking as a flavoring agent	(Sagala et al., 2020)
	Pycnarrhena tumefacta Miers	Mekai/Bekai	Eye sore	Leaves	Take 1 young bekai leaf that rolls up, pull out the water and drop it on the sore eye.	(Setiawan & Hazyrul, 2022)
	Fibraurea chloroleuca Miers	Akar Kuning/Aka Kuning	Eye sore	Root	Taken 1 drop of water that comes out of the root to a red or sore eye.	(Setiawan & Hazyrul, 2022)
	Coscinium fenestratum (Gaertn.) Colebr.	-	Respiratory, Digestive	Root	Chewed directly or boiled with water	(Sundara Rajoo et al., 2023a)
Amaranthaceae	*Amaranthus tricolor* L.	Bayam Merah	Poisonous animal bites	Leaves	Mashed or grated paste on the wound, enough	(Sagala et al., 2020)
Acanthaceae	*Graptophyllum pictum* (L.) Griff.	Kemba/ Kembat Hitam	To bathe the baby's lender and itch	Leaves	Wash it clean, grate it and rub it on your body then wash it clean. 2 times a day	(Sagala et al., 2020)
	Justicia gendarussa Burm.f.	Kembat (Pue Bule)	For bathing babies and itching	Leaves	Wash it clean, grate it and rub it on your body then wash it clean. 2 times a day	(Sagala et al., 2020)
	Hemigraphis bicolor Boerl.	Tumbuh Daging	Bleeding	Leaves	Boiled with three glasses of water until it boils to	(Sagala et al., 2020)

					one glass, then drunk three times a day	
	Hemigraphis sp.	Sugi Gajah	Internal infection	Leaves	The leaves are cleaned first and then grated. Drink twice a day	(Sagala et al., 2020)
	Clinacanthus nutans (Burm.f.) Lindau		Skin	Leaves	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
Euphorbiaceae	*Excoecaria cochinchinensis* Lour.	Serat Merah	Rheumatism	Leaves	Boiled in 3 glasses of water until 2 glasses remain. Drink 3 times a day	(Sagala et al., 2020)
	Euphorbia tithymaloides L. Syn.Pedilanthus tithymaloides (L.) L.	Patah Tulang	For broken bones	Leaves	Boil it until it boils and drink it twice a day	(Sagala et al., 2020)
	Endospermum diadenum (Miq.) Airy Shaw	-	Digestive and skin	Leaves	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
Polypodiaceae	*Pyrrosia piloselloides* (L.) M. G. Price	Letek	Tumour	Leaves	Washed clean and boiled until boiling. Drink 3 times a day	(Sagala et al., 2020)
Orchidaceae	*Acriopsis liliifolia* (J. Koenig) Seidenf.	Bawang Kayu (Paku Jet)	For bleeding	Rhizome	Wash clean then mash and boil 2 glasses of water until 1 glass is left. Drink 3 times a day	(Sagala et al., 2020)
Nephrolepidaceae	*Nephrolepis cordifolia* (L.) C. Presl	Julut	Vagina complications	Root	Wash it clean and then boil it, the boiled water is	(Sagala et al., 2020)

					washed on the vagina	
Amaryllidaceae	*Crinum* sp.	Bakung	Broken bones	Leaves	The leaves are roasted and then wrapped or tied to the painful part	(Sagala et al., 2020)
Compositae	*Veronia amygdalina* Delile	Udo Lepek	Diabetes	Leaves	Wash clean and boil until boiling. Drink twice a day	(Sagala et al., 2020)
	Ageratum conyzoides (L.)	Tambora	Blood bleach	Leaves	Boiled in two glasses of water make one glass and drink once a day	(Sagala et al., 2020)
	Tagates erecta L.	Bunga Saret Batak	Coughing up phlegm	Root	Boiled in three glasses of water until the remaining two glasses of chilled water. Drink three times a day	(Sagala et al., 2020)
Malvaceae	*Hibiscus rosa-sinensis* L.	Kembang Sepatu	Pus urine	Leaves	Wash clean, boil in four glasses of water until one glass is left, filter and drink once a day	(Sagala et al., 2020)
Malvacea	*Abelmoschus manihot* L.	Gedi/Ludo kayu	Urinary Tract Infection	Leaves	Take 7-8 leaves, wash them clean, then boil them until the boiled water changes colour, filter and drink. Drink 3 times a day.	(Setiawan & Hazyrul, 2022)

	Abelmoschus esculentus L.	Okra/Ludu Buak	Urinary Tract Infection	Leaves	Take 7-8 pieces of leaves, wash clean, then boil until the boiled water changes colour, filter and drink. Drink 3 times a day.	(Setiawan & Hazyrul, 2022)
	Abelmoschus moschatus Medik.	-	Skin, Endocrine/Metabolic and Nutritional	Fruit/ Seed	Directly consumed or added to cooking as a spice	(Sundara Rajoo et al., 2023a)
Lythraceae	*Lawsonia inermis* L.	Pacar	For wounds/swelling	Leaves	Wash it clean and mash and paste it on the sore part	(Sagala et al., 2020)
Cyperaceae	*Rhynchospora colorata* (L.) H. Pfeiff. Syn. Cyperus kyllingia Endl.	Kaput Burit	For vaginal cleansing	Leaves	Wash it clean and then boil it, the boiled water is washed on the vagina	(Sagala et al., 2020)
Phyllanthaceae	*Phyllanthus niruri* L.	Nyiur Hongo (Udo Anggok)	Scabies and wounds	Leaves and roots	Washed, mashed and then applied to the sore part/boiled, drink twice a day	(Sagala et al., 2020)
	Sauropus androgynus (L.) *Breynia androgyna* (L.) Chakrab. & N. P.Balakr	-	General and Unspecified, Respiratory, fever, Influenza	Leaves	Boiled and water is consumed or bathed with	(Sundara Rajoo et al., 2023a)
Fabaceae	*Spatholobus littoralis* Hassk	Bajakah/A kar gelang	Diarrhoea	Root	Take a sufficient amount of root, then wash it clean, boil it and filter the water and drink it.	(Setiawan & Hazyrul, 2022)

					Drink 3 times a day.	
	Spatholobus ferrugineus (Zoll. & Moritzi) Benth.	-	Digestive and skin	Root	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
	Senna alata (L.) Roxb.	-	Digestive and skin	Leaves	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
	Parkia speciosa Hassk.	-	Musculoskeletal	Skin of fruit	Fruit skin is used to wrap around affected area	(Sundara Rajoo et al., 2023a)
	Mimosa pudica L.	-	Musculoskeletal	Stem	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
	Derris elliptica (Wall.) Benth.	-	Respiratory and Skin	Roots	Burned like incense and inhaled	(Sundara Rajoo et al., 2023a)
Solanaceae	*Nicotiana tabacum* L.	Tembakau/ Sugi	Diarrhoea	Leaves	Take enough leaves, wash them clean, then add hot water until it changes colour, then the water and drink. Drink 3 times a day.	(Setiawan & Hazyrul, 2022)
			Skin	Stem	Chewed and applied on affected area	(Sundara Rajoo et al., 2023a)
	Solanum lycopersicum L.	-	Endocrine/Metabolic and Nutritional	Fruit	Grinded and consumed	(Sundara Rajoo et al., 2023a)
	Capsicum annuum L.	-	Skin	Fruit	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
Lauraceae	*Eusideroxylon zwageri*	Ulin/Buluan	Diarrhoea	Bark	Take enough wood that has been cut and	(Setiawan & Hazyrul, 2022)

					washed clean then burn it until it becomes charcoal and add water and drink it. Drink 3 times a day. Take enough wood, wash it clean, then boil it until the boiled water changes colour and drink it. Drink 3 times a day.	
	Litsea cubeba (Lour.) Pers.	-	Musculoskeletal, Respiratory	Fruit/ Seed	Pounded and boiled, water is consumed and bathed with	(Sundara Rajoo et al., 2023a)
Basellaceae	*Anredera cordifolia* Ten	Binahong/ Ludu Aka	Panu/Water fleas	Leaves	Take a sufficient amount of leaves, mash until smooth and apply to the area of the skin that has panu or water lice.	(Setiawan & Hazyrul, 2022)
Passifloraceae	*Passiflora foetida* L.	-	Cardiovascular, Endocrine/Metabolic and Nutritional	Root	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
Araceae	*Homalomena cordata* Schott	-	Digestive and skin	Root	Dried, cut, and boiled. Water is consumed	(Sundara Rajoo et al., 2023a)
Cunoniaceae	*Pterophylla fraxinea* D.Don	-	General and Unspecified	Root	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)

Asteraceae	*Blumea balsamifera* (L.) DC.	-	Digestive, Pregnancy and skin	Leaves	Boiled and water is consumed. Boiled and water is bathed with	(Sundara Rajoo et al., 2023a)
	Vernonia amygdalina (Delile) Sch.Bip.	-	General and Unspecified	Leaves	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
Rubiaceae	*Uncaria acida* (W. Hunter) Roxb.	-	Digestive, Endocrine/Metabolic and Nutritional	Roots	Water in roots is consumed	(Sundara Rajoo et al., 2023a)
Oxalidaceae	*Averrhoa carambola* L.	-	Cardiovascular	Leaves	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
Melastomataceae	*Memecylon garcinioides* Blume	-	Eye	Leaves	Squeezed and applied on affected area	(Sundara Rajoo et al., 2023a)
	Melastoma sanguineum Sims	-	Digestive	Leaves	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
	Melastoma malabatricum	-	Digestive	Leaves	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
Meliaceae	*Lansium domesticum* Correa	-	Digestive	Leaves	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
Cucurbitaceae	*Momordica charantia* L.	-	Endocrine/Metabolic and Nutritional	Fruit	Cut and applied on affected area	(Sundara Rajoo et al., 2023a)
Euphorbiaceous	*Plukenetia volubilis* L.	-	Endocrine/Metabolic and Nutritional	Leaves	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
Aristolochiaceae	*Apama tomentosa* (Blume) Ding Hou	-	Skin	Leaves	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
Orobanchaceae	*Striga asiatica* (L.) Kuntze	-	Musculoskeletal	Leaves	Dried then boiled, and water is consumed	(Sundara Rajoo et al., 2023a)
Acoraceae	*Acorus calamus* L.	-	Digestive	Root	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
Thymelaeaceae	*Aquilaria malaccensis* Lam.	-	Endocrine/Metabolic and Nutritional	Root	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
	Phaleria macrocarpa (Scheff.) Boerl.	-	Cardiovascular	Fruit	Fruit skin is boiled, water is consumed	(Sundara Rajoo et al., 2023a)

Convolvulaceae	*Ipomoea batatas* (L.) Lam	-	Skin	Leaves	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
Tetramelaceae	*Octomeles sumatrana* Miq.	-	Digestive	Stem	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
Dipterocarpaceae	*Shorea bracteolata* Dyer.	-	Digestive	Stem	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
Blechnaceae	*Blechnum orientale* L.	-	Skin	Leaves and Stem	Pounded and applied on affected area	(Sundara Rajoo et al., 2023a)
Athyriaceae	*Diplazium esculentum* (Retz.) Sw.	-	Skin	New shoots	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
Simaroubaceae	*Eurycoma longifolia* Jack	-	Musculoskeletal	Roots	Boiled and water is consumed	(Sundara Rajoo et al., 2023a)
Moraceae	*Artocarpus heterophyllus* Lam.	-	Endocrine/Metabolic and Nutritional	Fruit	Fruit consumed directly	(Sundara Rajoo et al., 2023a)

Kenyah Sarawak Ethnomedicine

In Sarawak, traditional healers primarily employ the plant species in the treatment of digestive and heart conditions among indigenous communities as recorded in Table 1. Researchers cited that Zingiberaceae, Annonaceae, Rubiaceae, Piperaceae, Leguminosae, and Lamiaceae are the most common families of therapeutic plants. (Bakar et al., 2023; Sundara Rajoo et al., 2023a).

The five most commonly used medicinal plants among Kenyahs in general are Senudung (*Leuconotis eugeniifolia*), Misai Kucing (*Orthosiphon Aristatus*), Logan and burung kerokop (Khan et al., 2023). Another study in Bintulu area (Sarawak), the twenty-four people who took the survey named sixty-one different types of plants with total of seven plants namely *Blumea balsamifera, Coscinium fenestratum, Derris elliptica, Homalomena cordata, Piper betle, Annona muricata, and Senna alata* were mentioned by more than 20% of the participants in the Uma Kulit, Lebu Kulit, Uma Badeng, Uma Baha (Sundara Rajoo et al., 2023a).

Such ethnobotanical plants are utilized for medicinal purposes for treating diabetes, urinary tract infections, lugol, biting pain, bloated stomach, and broken bones complication (Khan et al., 2023). The leaves, next the roots, and finally the bark, were the most utilized portions of plants. According to Bakar et al. (2023) the herbs were used in a number of preparations and administration methods, such as decoction, infusion, and poultice. Given the present climate and biodiversity problems, the preference for leaves over other plant parts could be a sustainable and beneficial trend. In particular, *Phyllanthus niruri, Orthosiphon stamineus,* and *Eurycoma longifolia* were among the ethnomedicinal plants identified in the literature study as being utilized by the Kenyah people. Nevertheless, these plants are used to cure a wide range of diseases, such as fever, hypertension, and renal issues (Khan et al., 2023).

Another indigenous community in Malaysia, the Orang Asli, had their medicinal plant practices studied elsewhere, which is in line with the findings from this study (Abdullah et al., 2021). Similar to the Kenyah people, the Orang Asli utilize a diverse range of plant species for medicinal purposes, according to Abdullah et al. (2021). This includes *P. niruri, O. stamineus*, and *E. longifolia.* Another indigenous Malaysian community, the Jakun Orang Asli, also used ethnomedical plants for medicinal purposes; researchers in Pahang, Malaysia, found a similar trend (Ismail, 2017; Ramli et al., 2021). While the Kenyah people make extensive use of *P. niruri* for medicinal purposes, the Jakun Orang Asli people use a far broader range of plant species. Similar to the Kenyah people, the Jakun Orang Asli use a number of preparation methods. These methods include poultice, decoction, infusion.

Furthermore, Ayurvedic, Chinese herbal, Malay traditional, and other Asian ethnomedicinal systems have pioneered the use of the majority of the plants enlist. Kenyah used four species otherwise *Sauropus andrognus, P. betle, D. elliptica*, and *C. fenestratum* to treat fever, influenza, and nonmedical medication toxicity (Sundara Rajoo et al., 2023a). These remedies are rarely discussed in any literature. On the other hand, four varieties of wild peppers namely *Piper rueckeri, Piper borneense, Piper umbellatum*, and *Piper auritifolium* have been identified as leafy green vegetables eaten by the Orang Ulu people of Belaga, Sarawak (Alan et al., 2022). Not only were these pepper species eaten by the Orang Ulu people as a source of sustenance, but they also had medicinal uses, including the alleviation of constipation, heat and toxins, and the prevention of malaria which is noteworthy to be further researched.

Diplazium esculentum and *Pycnarrhena tumefacta* were also cited in a study by (Yusli et al., 2021) regarding consumption of indigenous leafy vegetables that is a common practice among local people in Bintulu, Sarawak included with 5.80% of their respondent as Kenyah. *D. esculentum* and *P. tumefacta* has local name of paku and tubu, respectively while *P. tumefacta* is called Mekai or Bekai in Kenyah language. These two plants are not cultivated according to the locals. The leaves and stem of *D. esculentum* are

chopped and fried together with anchovies and shrimp paste while the *P. tumefacta* leaves are added in the preparation of meat and fish dishes. These two plants both are reported in Table 1 to carry the ethnomedicinal use for skin and eye sore respectively.

In short, Kenyah indigenous medicine draws on both local plant life and the herbal remedies practiced by other communities. As indicated before, this is probably because the Kenyah culturally think that all therapies in various traditional medicinal practices are acceptable, but their efficiency varies from person to person. So, people look for an individual approach that helps them the most. The result is a medicinal flora that is distinctive to the Kenyah, one that incorporates both traditional herbal practices and modern scientific knowledge.

Comparative Analysis of Kenyah Ethnomedicine in Borneo

By comparing the recorded data across regions, it can be evaluated the potential impact of geographical and ecological factors on indigenous activities. Using Venn diagrams, the separated ethnomedicinal data was named into two groups: those from Kalimantan and those from Sarawak who employ plants in traditional medicine. Figure 1 shows Kenyah Sarawak overlap of the overall recorded traditional plants which refer only to those species that were reported by both groups.

Of the 100 plants species, only 13 were shared between the two groups indicated before. Therefore, the image implies that even plants documented in both groups likely have highly varied traditional applications within each cluster, which are likely based on local circumstances. According to these results, there are significant differences in actual plant uses, and the plants utilized in Kalimantan and Sarawak Kenyah from one another, even if they are located in very similar ecological zones providing a big gap for future studies. In short, folk medicinal herbal knowledge in Borneo has been greatly influenced by both geography/ecology and ethnicity/cultural customs accordingly to this pattern.

According to ethnobotanical table summary conducted in the Borneo region, 53 families including 100 species were found to have practical uses in the traditional medicine of the Kenyah people. The richest families in terms of species were Poaceae (8), Zingiberaceae (6), and Fabaceae (6), which accounted for 37.7% of the total number of species. The dominant species otherwise species existed at least twice were Poaceae, Zingiberaceae, Fabaceae, Acanthaceae, Annonaceae, Lamiaceae, Menispermaceae, Euphorbiaceae, Compositae, Malvacea, Solanaceae, Piperaceae, Rutaceae, Liliaceae, Myrtaceae, Phyllanthaceae, Lauraceae, Asteraceae, Melastomataceae, and Thymelaeaceae are found in Figure 2.

On the other hand, Table 1 and Figure 3 include botanical details as well as information about the plants' ethnomedical uses, including the following: plant part/product, preparation method, application mode, diseases treated/respondent count (ICPC-2). The plant parts most commonly used to make a variety of herbal preparations were the leafy parts (49 citations), followed by roots (19 citations), fruits or seed (10 citations), other plant parts (6 citations), stem (4 citations), combination of plant parts (4 citations), and rhizome (2 citations) (Figure 4). Other plant parts were namely new shoots, bark, and fruit skin while combination usage can be stem and roots, leaves and roots, leaves and stem or fruit added with honey. It is worth mentioning that none cited flowers as there ethnomedicinal usage part which may be a study gap for further field research.

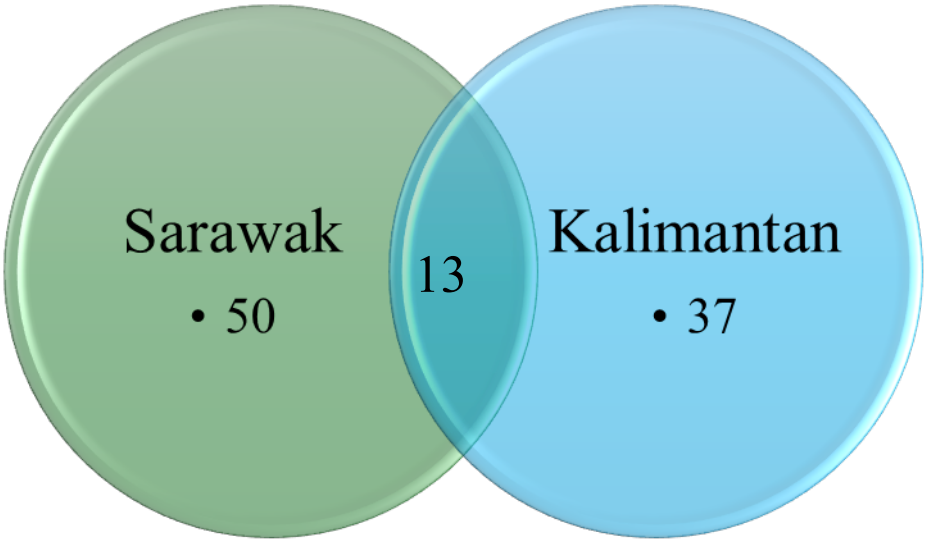

FIGURE 1: Venn diagrams showing the comparison of ethnomedicinal plants used by Sarawak and Kalimantan Kenyah

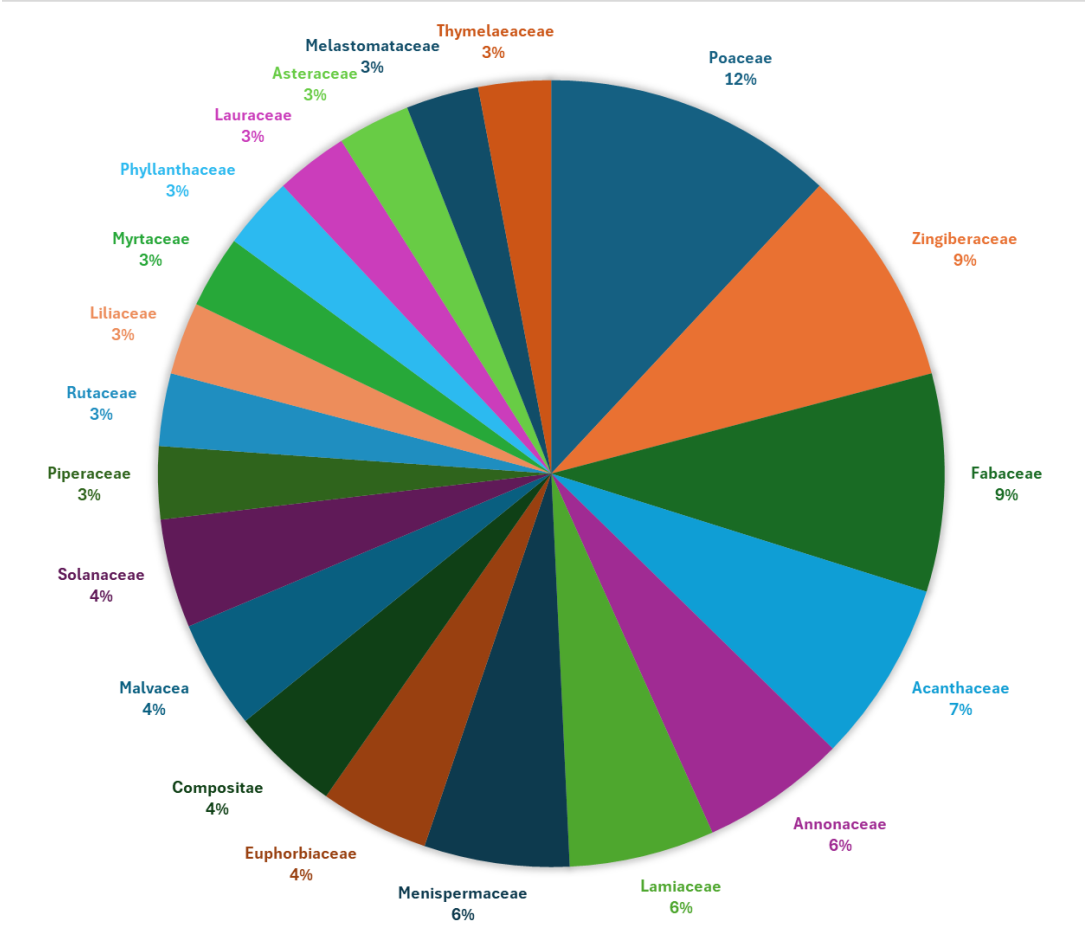

FIGURE 2: Ethnomedicinal plant families that are more dominant in the region under investigation

Rare Plants Documented with Potential Medical Uses

The most commonly referenced plant species in traditional Kenyah medicine is said to be *Coscinium fenestratum*, which is mostly used to treat non-medical substance toxicity (Sundara Rajoo et al., 2023a). Wounds, ulcers, digestive problems, fever, and other diseases have all been traditionally treated with this species. On the other hand, the species is solely used in traditional medicine by the Muruts of Sabah on Borneo to alleviate skin thinning and yellowing (Kulip, 2003). Akar penawar, meaning "the antidote root" in approximate translation, is the popular name of this plant species and another evidence of its importance in this culture's medicinal practices. Traditional medicine practitioners in the Indochina region, particularly those from Indian populations, have long recognized the medicinal value of this plant. Ayurvedic medicine, on the other hand, makes reference to the species not as a poisoning remedy but as one for a wide variety of other ailments, including diabetes, tetanus, fever, skin diseases, abdominal disorders, jaundice, inflammations, ulcers and general debility (Danapur et al., 2020). There is a lack of scientific evidence about its safety, despite its widespread use (Sundara Rajoo et al., 2023a). A new study that looked at the bioactive chemicals of this species found that it has a lot of them, and they can help prevent oxidative stress-related disorders (Basavaraj & Ashok, 2012). Having said that, research on the efficacy of *C. fenestratum* in poison treatment has not yet been conducted, therefore, additional research in this field is necessary.

Ayurvedic and traditional Southeast Asian medicine make extensive use of the plant *Piper betle*, more often known as betel pepper (Dwivedi & Tripathi, 2014). As a natural breath freshener, chewing the leaves of this plant is a popular practice after meals. Traditional Asian medicine makes considerable use of *P. betle* to treat a wide variety of illnesses. It was mentioned that nine additional ethnic groups in Borneo and the surrounding areas use it for various purposes namely the Malay for indigestion, the Suku Bima for nosebleeds, the Dayaks for headaches, the Dusun for reduced coughs, the Alune for vaginal discharge, and the Kulisus for postpartum care (Carsono et al., 2022; Sakinah & Misfadhila, 2020). Its principal use in Kenyah traditional medicine is fever treatment. Nevertheless, there are few accounts of this species being used for this purpose. Kenyah folks boil the leaves and use the water for cooking or a bath, rather than chewing them as is typical in other traditional medicine methods. Many people think this will help bring down fevers.

Sauropus androgynus, like *P. betle*, is established with pharmacological studies and extensively utilized in Ayurveda and traditional Malay medicine for a variety of ailments, including urinary tract infections, heart conditions, and problems with breastfeeding (T. Arif, 2020; Dwivedi & Tripathi, 2014). Despite this, the Kenyah employ it as a fever remedy, and records of the species' usage in this regard are few. A shrub native to India and some regions of Southeast Asia, *S.androgynus* can reach a height of half a meter. As a result, the species' widespread usage in Ayurveda and Malay traditional medicine comes as no surprise (T. Arif, 2020). The water is either drunk or used as a bath after boiling *S. androgynus*. According to Hikmawanti et al., (2021) and Zhang et al., (2020), the documented applications of this product were for urinary concerns, cardiovascular disorders, and post-partum symptoms and problems, including concerns related to lactation. Studies on the pharmacology of this species have mostly concentrated on these areas, with very little research into its potential for treating influenza virus or any clinical proof.

The woody climber *Derris elliptica*, which has no clinical evidence but has been well reviewed in pharmacology, is native to East Asia and can reach a maximum length of 12 meters. Southeast Asia, South Asia, tropical Africa, and tropical America are currently among its most common habitats. Much of the plant's value to indigenous peoples comes from its reputation for toxicity. Many Bornean tribes people utilize this plant to produce poison arrows for fishing and hunting (Rashed, 2020; Uy & Villazorda, 2015). It is also a key ingredient in organic pesticides made in Indonesia. Traditional Kenyah medicine makes use of the herb to alleviate flu and fever. Researchers have shown that this species has antisepsis properties and is frequently used to treat infections such as leprosy and abscesses (Sundara Rajoo et al., 2023a; Trang et

al., 2023). There is little information on this species' usage as a fever or influenza therapy, despite the abundance of records for it. Also, additional Bornean groups' traditional medical uses of this plant have been mostly undocumented. Although the species possesses a wide range of antimicrobial properties, clinical investigations have been few and far between, particularly when it comes to testing its efficacy against influenza (Rashed, 2020).

The Argentine shrub *Senna alata* is well studied plant in research that has spread over much of Asia and Africa from its original homeland. In traditional Chinese medicine and Malay medicine, this plant species is used to treat skin problems (Alshehri et al., 2022). Kenyah folks used the plant for scabies, boils, and bug bites or as repellent. *S. alata* and *Goniothalamus macrophyllus* were the two most often mentioned species for this group of ailments. The skin problems that *S. alata* was identified for were scabies, skin symptoms/complaints, and laceration. However, none of the reported use of Kenyah for *G. macrophyllus* were for anything other than bug bites or repellent. Various portions of the plant are utilized for numerous ailments in traditional medicine in Malaysia, which makes this species widely used. According to Shakri et al. (2020). the leaves can alleviate fever symptoms, while the roots can be utilized to promote menstruation. Traditional Kenyah medicine holds that burning the plant's wood like incense will both dispel pests and alleviate their bites. People in the Andaman Islands also think the smoke helps with asthma. The plant's ability to heal digestive issue and skin disorders, particularly cuts and pigmentation problems, has been confirmed by clinical research (Liu et al., 2022).

Orthosiphon aristatus, or kumis kucing as it is known in Indonesia, is a member of the Lamiaceae family. Traditional medicine practitioners have long relied on this plant for the treatment of a wide range of conditions, including bacterial and UTIs, inflammation, rheumatism, influenza, angiogenesis, jaundice, and infuenza. The plant is very established with clinical and biological research particularly famous for diabetes. Traditional medicine practitioners in Malaysia often prescribe *O. aristatus* aerial parts to manage hypertension, rheumatoid arthritis, gout, diabetes, and rheumatic fever (Batubara et al., 2020). Decoction of the plant is also consumed in Malaysia to eliminate bladder and kidney stones. *O. aristatus* has been utilised in the folk or traditional medicine of Asian cultures for centuries. Besides its principal use as a diuretic, the herb is used as a remedy against renal and urinary disorders as well as various other diseases (Chai et al., 2014). Both *S. alata* and *O. aristatus* have clinical proof of the cited Kenyah ethnomedicinal use thanks to their research establishments.

An aromatic perennial shrub that can reach a height of up to three meters, *Blumea balsamifera* has been evaluated and established in lab research, but there is no clinical data available on it. Traditional Malay medicine makes extensive use of this species as a postpartum remedy (Wannes & Tounsi, 2021). Numerous chemical and pharmacological investigations revealed that the species exhibited antifungal, wound healing, antioxidant, antibacterial ability (Pang et al., 2014). Nevertheless, the pharmacological wisdom of Kenyah using the plant to treat digestive, pregnancy and skin disease in clinical studies remains scarce and unexplored.

The claimed Kenyah uses of *Homalomena cordata* are diverse, spanning from fever and stomach issues to lacerations, boils, and even cancer. According to Rajoo et al. (2023), this practice is widespread in Southeast Asia and is used as a traditional remedy for various health problems, particularly those related to the digestive system and skin. Noteworthily, no clinical or even pharmacological evidence is available for this plant species, which is same for *Nephrolepis cordifolia* and *Rhynchospora colorata* which explained the significance of potential to open up for research.

Phytopharmacological Studies of Kenyah Ethnomedicine

According to Table 2, the research gap between modern study and traditional use of Kenyah medicinal plant will be thoroughly discussed followed by their data incompleteness in terms of pharmacological and clinical trial aspect. Firstly, a few plants used by the Kenyah are well studied, established with review article and clinical studies namely *Orthosiphon aristatus, Curcuma longa, Kaempferia galanga, Carica papaya, Piper betle, Piper nigrum, Annona muricata, Imperata cylindrica, Aloe vera,* and *Psidium guajava*. These plants are commonly used in Asean countries and easily accessible. Nevertheless, the clinical studies done on these plants are not correlated with the wisdom of Kenyah ethnomedicinal use for instance, *O. aristatus* is clinically tested for anti-lithiatic (renal stones) and antihypertensive but not on diabetes and stomach-aches. Similarly, for *K. galanga* which have been tested for knee osteoarthritis and anti-inflammation but unrelated clinical studies on cardiovascular, respiratory disease are not carried out.

Despite some plants are well established with review paper and their pharmacological yet found with limited or unrelated clinical studies conducted related to Kenyah ethnomedicinal usage such as *Graptophyllum pictum* with only antifungal studies, *Vernonia amygdalina* with only antimalarial studies, *Ageratum conyzoides* with arthritis and analgesic studies, *Euphorbia tithymaloidesa* with only antiviral studies and *Senna alata* with constipation and *Pityriasis versicolor* in humans' clinical studies.

On the other hand, certain medicinal plants are reported with zero clinical studies but related pharmacology to Kenyah ethnomedicinal uses such as *Eleutherine bulbosa, Pycnarrhena cauliflora, Justicia gendarussa, Derris elliptica, Blumea balsamifera, Coscinium fenestratum, Goniothalamus macrophyllus, Sauropus androgynus, Blechnum orientale*, *Abelmoschus esculentus, Citrus aurantifolia*, and *Anredera cordifolia.* These plants are well reported with review on pharmacology usage and even some related to the Kenyah people usage therefore are classified as the most potential to push for clinical studies. Nevertheless, no studies were reported with utilization of *C. aurantifolia* and *A. cordifolia* on panu or water fleas in relation with the Kenyah application.

Furthermore, limited studies on pharmacological uses on particular plant part used by Kenyah namely *Hibiscus rosa-sinensis* and *Abelmoschus manihot* which is profoundly studied on flower but not the leaves part which are used by Kenyah folks to treat pus urine and urinary tract infection (UTI) respectively. *Imperata cylindrica* is rarely studied on the roots particularly in the aspect of bone pain reported by the Kenyah people.

A few important plants are found to have limited pharmacological research and no reported review article namely *Pycnarrhena cauliflora, Excoecaria cochinchinensis, Pyrrosia piloselloides*, and *Goniothalamus macrophyllus* due to limited research and data available. *Nephrolepis cordifolia* has no pharmacological data about the root while *Rhynchospora colorata* has only been reported with an antibacterial study. Most importantly, a plant cited by the Kenyah namely *Homalomena cordata* has no research data available despite the potential for treating digestive and skin issue.

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TABLE 2: Ethnopharmacology of Kenyah Ethnomedicinal Plants

Plant	Common name	Main chemical constituent	Antioxidant (DPPH)	*In silico, in vitro, in vivo* general pharmacology	Clinical studies	Traditional Use by Kenyah	Reference
Orthosiphon aristatus	Cat's Whiskers	Leaves sinensetin, rosmarinic acid, (spearmint clinial), and eupatorine	Aqueous: IC_{50} = 9.6 ug/mL Ethanol: IC_{50} = 21.4 ug/mL Methanol: IC_{50} = 147-386 ug/mL	• Antidiabetic • Antiviral • Antimicrobial • Anti-Inflammatory • Antihypertensive • Anti-Angiogenic • Analgesic • Hepatoprotective	• Anti-lithiatic (renal stones) • Antihypertensive (no clinical study on diabetes and stomachache)	Diabetes, stomach-ache	(Batubara et al., 2020; Chai et al., 2014; Faramayuda et al., 2021)
Curcuma longa	Turmeric	Root Digalloyl-hexoside, Caffeic acid, hexoside, Curdione, Coumaric, Sinapic acid, Qurecetin-3-D-galactoside, Casuarinin, Bisdemethoxycurcumin, Curcuminol, Demethoxycurcumin, and Isorhamnetin, Valoneic acid bilactone, Curcumin, Curcumin-*O*-glucuronide (derivative are tested)	Ethanol: IC_{50} = 27.2 ± 1.1 µg/mL Ethyl acetate: IC_{50} = 9.861 mg/mL	• Antidiabetic • Anti-inflammatory • Antimicrobial • Hepatoprotective • Anticancer • Cardiovascular • Gastrointestinal	• Anti-inflammation • Skin • Central Nervous System • Respiratory • Cardiovascular • Gastrointestinal • Urogenital • Antidiabetic	General and Unspecified	(Chanda & Ramachandra, 2019; Memarzia et al., 2021; Rohman et al., 2020; Sabir et al., 2021; Salehi et al., 2019)
Kaempferia galanga	Ginger	Root Ethyl-para-methoxycinnamate and ethyl-cinnamate, 1,8-cineole, borneol,	Methanol: IC_{50} = 16.58 µg/ml.	• Antidiarrheal activity • Hypolipidemic activity	• Knee Osteoarthritis	Digestive, Cardiovascular, Respiratory	(Khairullah et al., 2021; Munda et al., 2018; Sikta et al., 2018;

		linoleoyl, methyl-cinnamate and pentadecane	Aqueous: IC_{50} = 19.5 ug/ml	• Anti-Tuberculosis Activity • Treatment of diabetes, hypertension, cough, asthma, joint fractures, rheumatism, urticaria, vertigo, and intestinal injuries	• Anti-inflammation		Taslim et al., 2019; S. Y. Wang et al., 2021)
Carica papaya	Papaya	Leaves pseudocarpain and carpain, enzymes (cystatin, chymopapain and papain), ascorbic acid, nicotinic acid, dehyrocarpaine and choline, carposide.	Methanol: EC_{50} = 7.8 ±0.06 mg/mL. Ethanol: IC_{50} = 75.05%	• Anthelmintic property • Antimalarial and anti-plasmodial property • Antimicrobial property • Antifungal • Antiviral • Anticancer • Anti-inflammatory • Antidiabetic • Anticancer • Male antifertility property • Hepatoprotective property • Anti-ulcer • Wound healing • Anti-sickling property	• Methicillin-Resistant Staphylococcus aureus (MRSA) (skin, wound and high vaginal swab) • Anticancer • Dengue fever • Inflammatory bowel diseases • Anti-ulcer, wound healing • Histaminergic	Diarrhoea, Skin	(Alara et al., 2022; Maisarah et al., 2013)

Piper betle	Sirih/betel	Leaves chavicol, chavibetol, carvacrol, eugenol, estragol, hydroxychavicol, Allylpyrocatechol, and β-Caryophyllene	Ethanol: IC_{50} = 9.362 µg/mL Methanol: IC_{50} = 345.7 µg/mL Ethyl acetate: IC_{50} = 23.25 µg/mL Hexane: IC_{50} = 144. 3 µg/mL Aqueous: IC_{50} = 179.5 µg/mL	• Antimicrobial • Analgesic • Anti-inflammatory • Anticancer • Antidiabetic • Hepatoprotective	• Antifungal (*Candida albicans*) • Anti-inflammatory activity (β-caryophyllene)	Sore throat Toothache Eye, Neurological, Respiratory	(Carsono et al., 2022; Dwivedi & Tripathi, 2014; Okonogi et al., 2021; Sakinah & Misfadhila, 2020)
Piper nigrum	Black pepper	Fruit/ Seed piperine, piperlonguminine, pellitorine, piperolein B, piperamide (piperine), piperettine, and (-)-kusunokinin (only piperine)	Hexane: IC_{50} =1830.0 lg/mL Chloroform: IC_{50} =164.9 lg/mL Methanol: IC_{50} = 153.9 lg/mL Aqueous: IC_{50} =1025.0 lg/mL	• Antimicrobial • Anticancer • Antidiabetic • Anti-inflammatory • Analgesic • Anticonvulsant • Neuroprotective effects	• Anticonvulsant • Liver and kidneys protective • Dementia and Alzheimer's	General and Unspecified	(Takooree et al., 2019; Talebi & Mojab, 2022)
Annona muricata	Soursop	Leaves Reticuline, coreximine, isoquinoline, aporphine and protoberberine, Annonacin and Megastigmanes.	Methanol: IC_{50} = 221 µg/mL Ethanol: IC_{50} = 70 µg/mL	• Antimicrobial • Anti-inflammatory • Anti-protozoan • Contraceptive	• Diabetes mellitus • Hypoglycemic activity • Anticancer	Digestive, Cardiovascular, Respiratory, Endocrine/Metabolic and Nutritional	(Coria-Téllez et al., 2018)

				• Hepato-protective • Anti-icteric • Hypoglycemic activities			
Imperata cylindrica	Cogon grass	Root Arundoin, cylindrin, friedelin, 14-epiarbor-7-en-3β-ol, 14-epiarbor-7-en-3β-yl formate, 14-epiarbor-7-en- 3-one, chromone, tricin**,** caryatin, jaceidin, 5-methoxyflavone**,** 5-hydroxyflavone	Ethanol: IC_{50} = 824.30 mg/mL Methanol: IC_{50} = 2.14 µg/mL	• Anti-inflammatory • Chemopreventio n • Neuroprotection	• Antiobesity	bone pain, Neurological	(Indriyanti et al., 2022; Jung & Shin, 2021; Nayim et al., 2023)
Aloe vera	Lidah buaya/ aloe	Leaves aloe-emodin, aloin, aloesin, emodin, and acemannan	Methanol: IC_{50} = 58.8 ± 0.4 µg/mL ethanol: EC_{50} = 58.36 µg/mL	• Burn Skin wound healing • Anti-Inflammatory Activity • Intestinal absorption • Antimicrobial and prebiotic Activity	• Ulcers and Swelling • Wound healing • Oral submucous fibrosis • Chronic periodontitis • Skin elasticity and wrinkles	Skin complication	(Khaing, 2011; López et al., 2013; Sánchez et al., 2020)
Eleutherine bulbosa	Dayak onion/ tears of virgin	Rhizome naphthalene, anthraquinone, and naphthoquinone (vitamin K)	Ethanol: IC_{50} = 1.48 µg/mL	• Anti-inflammatory • Anti-microbial • Anti-hypertension • Anti-cancer • Anti-diabetic	-no clinical study	Tonsillitis	(Kamarudin et al., 2021)

				• Anti-melanogenesis			
Psidium guajava	Guava	Leaves guavanoic acid, guavacoumaric acid, 2-hydroxyursolic acid, 2-hydroxyursolic acid, isoneriucoumaric acid, asiatic acid, ilelatifol d and β-sitosterol-3-O-β-d-glucopyranoside, Myricetin, luteolin and kaempferol	Ethanol: EC_{50} = 53±2.0 mg/g Aqueous: EC_{50} = 130±1.0 mg/g	• Anti-diarrhoeal • Antimicrobial • Anti-inflammatory • Anti-viral • Anti-inflammatory • Anti-plaque • Anti-mutagenic	• Infectious gastroenteritis • Infantile rotaviral enteritis • Dysmenorrhea	Diarrhoea	(Gutiérrez et al., 2008; Naseer et al., 2018)
Pycnarrhena cauliflora	Pokok Ajinomoto/bekai	Leaves Oxirane dodecyl, gamma sitosterol, vitamin E (α tocopherol), 9.12-Octadecadienoic acid (Z,Z)- (natural linoleic acid), 3-Tetradecanynoic acid (myristic acid), and Phenol, 2,4-bis(1,1-dimethyl ethyl).	Ethanol: IC50 0.634 mg/mL	• Anticancer (human breast cancer) • Antidiabetic (α-Glucosidase) • Antifungal (*M. Furfur*) (limited)	-no clinical study	For cancer and flavoring	(R. Maharani et al., 2020; Masriani et al., 2019; Novia Putri et al., 2023)
Graptophyllum pictum	Tricolor Caricature Plant	Leaves n-octanyl capriate and n-decanyl cetoleate, Phytol, Tetracosane, Tetratertacontane, Squalene, Vitamin E, Tetratriacontane and Stigmasterol	Ethyl acetate: IC_{50} = 0.78 ± 0.01 mg/mL Butanol: IC_{50} = 2.58 ± 0.08 mg/mL Hexane: IC_{50} = 7.60 ± 0.28 mg/mL	• Antidiabetic activity • Antimicrobial • Immunomodulatory • Anti-inflammation • Anti-analgetic • Wound healing • Anti-hemorrhoid	• Antifungal activity (*Candida albicans*)	To bathe the baby's lender and itch	(Jiangseubchatveera et al., 2017; Makkiyah et al., 2021; Tahseen et al., 2023)

			Aqueous: IC_{50} = 18.8 ± 0.69 mg/mL	• Estrogenic effects			
Justicia gendarussa	Variegated Water Willow	Leaves 2-(2'-amino-benzylamino) benzyl alcohol, 0-methyl ethers, 2-amino benzyl alcohol, stigmasterol, lupeol, 16-hydroxylupeol, ß-sitosterol, aromadendrin, ß -Sitosterol- ß -D-glycoside, gendarusin A, gendarusin B, , gendarusin, and friedelin	Methanol: IC_{50} = 71.31 ± 0.42 µg/mL Ethyl acetate: IC_{50} = 74.20 ± 0.44 % Ethanol: IC_{50} = 32 µg/ml	• Antifungal • Antibacterial and antimicrobial • Anti-inflammatory activity • Anti-helminthic	- no clinical study	For bathing babies and itching	(Fisol et al., 2022; Jain et al., 2024; Kavitha et al., 2014; Mondal et al., 2019; Nirmalraj & Perinbam, 2015)
Vernonia amygdalina	Bitter leaf	Leaves 6β,10β,14β trimethylheptadecan15 α-olyl-15-O-β-D-glucopyranosyl-1,5 β olide, glucuronolactone, 11 α-hydroxyurs-5,12-dien-28-oic acid3 α,25-olide, 10-geranilanyl-O-β-D-xyloside, 1-heneicosenol O-β-D-glucopyranoside, apigenin, luteolin (3′,4′,5,7tetrahydroxyflavone), vernolide, hydroxyvernolide, hydroxyvernolide , hydroxyvernolide,	Ethanol: IC_{50} = 27.310±0.702 mg/g Aqueous: IC_{50} = 89.030±0.365 mg/g	• Anti-inflammatory • Anticancer • Antimicrobial • Hepatoprotective • Antidiarrheal • Anti-diabetic • Neuroprotective • Antimalarial	• Antimalarial activity	General and Unspecified	(Ugbogu et al., 2021; W. Te Wang et al., 2020)

		diterpene (ingenol-3-angelate), vernomygdin, 4-methylumbelliferone, cryptolepine, isocryptolepine, neocryptolepine, courmarins, vernolepin, and vernoniosides.					
Ageratum conyzoides	Billygoat-weed, chick weed, goatweed, whiteweed, mentrasto	Leaves Precocene I, chromene, β-sitosterol, stigmasterol, lycopsamine and pyrrolizidine	Ethanol: IC_{50} = 18.9 µg/ml Methanol: IC_{50} = 22.50 ± 3.18 µg/mL Aqueous: IC_{50} = 570.00 ± 6.00 µg/mL	• Anti-inflammatory • Antihemorrhagic • Antiseptic • Antileprosy • Wound healing	• Arthritis • Analgesic	Blood bleach	(Kotta et al., 2020; Patil et al., 2010; Yadav et al., 2019)
Euphorbia tithymaloides	Seashell Devil's Backbone, Seashell Zigzag Plant	Leaves cycloartenone, dammaronol A, dotriacontan-1-ol, friedelanol, hentriacontan-1-ol, sitosterol, Kaempferol, quercitrin, isoquercitrin, scopoletin, pedilanthus coumarin A, pedilanthus coumarin B, 5,7-dihydroxy-8-(2-methylbutyryl)-4-phenylcournarin, theraphin C, isodispar B, isodisparinol B and isomesuol.	Water: IC_{50} = 218.3 ± 7.80 µg/mL Methanol: IC_{50} = 110.0 ± 3.10 µg/mL	• Anti-diabetic, • Analgesic • Hemostatic • Anti-microbial • Antifungal • Antihelminthic • Antimutagenic • Anti-inflammatory • Antivenom • Antihemorrhagic • Antiviral • Antitumor	• Anti-viral activity (Inhibition of HSV-2 replication)	broken bones	(Abreu et al., 2008; Srivastava et al., 2019)

Excoecaria cochinchinensis	Chinese Croton	Leaves baccatin, ursolic acid, agallochin J, agallochin K, kaempferol, luteolin, excolabdone A, β-sitosterol, daucosterine, Excolabdone, Glochidionionoside B, excoecariosides A and B	-not reported	• Anti-inflammatory Effect • Breast cancer • Gastric cancer cell • Antimicrobial	-no clinical data	Rheumatism	(Giang et al., 2005; Kui et al., 2021; Nguyễn Phú Hùng & Lê Thị Thanh Hương, 2021; WANG Ye-ling et al., 2014; WANG Yun-song et al., 2009; Yang et al., 2005; Yin et al., 2008)
Homalomena cordata	Heart Shaped Homalomena	Root No data available				Digestive and skin	
Senna alata	candle bush/tree	Leaves anthraquinones, anthracene derivatives of rhein, emodol, aloe-emodin, sennosides A and B, 4,5- dihydroxy-1-hydroxymethylanthrone and 4,5-dihydroxy-2-hydroxymethylanthrone	Water: IC_{50} = 12.05 mg/mL Methanol: IC_{50} = 734.25 µg/mL Water/Methanol: IC_{50} = 684.01 µg/mL Ethanol: IC_{50} = 66.01 ppm Ethyl acetate: IC_{50} = 78.23 ppm	• Antibacterial • Antifungal • Antimicrobial • Antiviral • Antiprotozoal	• Constipation • *Pityriasis versicolor* in humans	Digestive and skin	(Alshehri et al., 2022; Jeweldai Vedekoi & Sokeng Dongmo Selestin, 2020; Priya et al., 2021; Rahmawati et al., 2022)
Derris elliptica	Tuba	Roots rotenone, derieliptosides A-C, 2-	Aqueous: EC_{50} = 229.85 ppm	• Antibacterial activity	-no clinical data	Respiratory and Skin	(Rashed, 2020; Trang et al., 2023; Uy &

		hydroxy-5-aminorotenonon, elliptoic acid, coumaronochromone, 6,4'-dihydroxy-7,5'-dimethoxy-coumaronochromone	Ethanol: EC_{50} = 350.05 ppm	• Hepatoprotective drugs • Antifungal activity • Antidiabetic • Larvicidal			Villazorda, 2015)
Blumea balsamifera	Sembong, Capa, Telinga kerbau	Leaves 3,4,5-trihydroxy-3,7 dimethoxyflavonones, 3,4,5-trihydroxy-7-ethoxyflavanone, 3,-O-7-biluteolin, 1,8-cineole, borneol, β-caryophyllene, camphor, 4-terpineol, a-terpineol, and caryophyllene oxide, (11Z)-11-hexadecenoic acid, trans-2-undercenoic acid, 9-hexadecenoic acid, capric acid, and palmitic acid	Methanol: IC_{50} = 72 g/mL Aqueous: IC_{50} = 52.48 ± 2.48 mg/mL 50% EtOH: IC_{50} = 139.93 ± 8.47 mg/mL 95% EtOH: IC_{50} = 36.55 ± 6.61 mg/mL Hexane: IC_{50} = 2.15 ± 0.07 mg/mL	• Antimicrobial • Antifungal • Anti-inflammatory • Hypolipidemic • Anti-infertility • Hepatoprotective activity • Antidiabetic • Gastroprotective • Antitumor • Antityrosinase activities • Wound healing activity	-no clinical data	Digestive, Pregnancy and skin	(Jirakitticharoen et al., 2022; Pang et al., 2014; Wannes & Tounsi, 2021)
Coscinium fenestratum	Tree turmeric	Root berberine, jatrorrhizine, palmatine, berlambine, dihydroberlambine, 12, 13-dihydro-8-oxo berberine, tetrahydroberberine, oxyberberine, noroxy hydrastinine, 8-	Methanol: IC_{50} = 57.1 µg/mL Ethanol: IC_{50} = 32 µg/ml	• Antidiabetic • Anti-gonococcal • Anticancer • Antibacterial • Antimalarial • Antihypertensive • Antiulcer • Neuroprotector • Wound healing	-no clinical data	Respiratory, Digestive	(Basavaraj & Ashok, 2012; Danapur et al., 2020)

		oxoprotoberberine, and 8-oxoberberine					
Goniothalamus macrophyllus	Lukai Kampong	Stem and Root Stem: Goniothalamin (styryl-lactone), geranyl acetate, germacrene D, geraniol, linalool and camphene; root: cyperene, geranyl acetate, geraniol and linalool. α-pinene, bicyclogermacrene, α-copaene and δ-cadinene (volatile)	-not reported	• Antimicrobial activity • Human cervical cancer cell • Colorectal cancer • Biolarvicidal	-no clinical data	skin	(Alabsi et al., 2012; Humeirah et al., 2010; Kurniawan et al., 2023; Liu et al., 2022; Shakri et al., 2020)
Sauropus androgynus	Sweet leaf	Leaves 3-O-*β*-D-glucosyl-(1-6)-*β*-D-glucosylkaempferol (GGK), lignan glycosides, lignin diglycoside, megastigmane glucoside, chlorogenic acid, caffeic acid, and ferulic acid	Methanol: IC_{50} = 341 *μ*g/mL Ethanol: IC_{50} = 88.33 ± 3.53 ppm	• Antimicrobial • Anti-inflammatory • Anticancer properties • Antidiabetes activity • Lactation inducing activity • Antiobesity/ weight lost (ggk) • Lung injury • *S. Androgynus* induced bronchiolitis obliterans	-no clinical data	fever and influenza	(T. Arif, 2020; Hikmawanti et al., 2021; B. dou Zhang et al., 2020)
Blechnum orientale	Deer fern	Leaves and Stem Chlorogenic, blechnic acid Rosmarinic, 7-epiblechnic acid,	Methanol: IC_{50} = 10.9 ±1.6 *μ*g/mL	• Antimicrobial • Anti-inflammatory • Anticancer • Wound healing	-no clinical data	skin	(Lai et al., 2010; Waswa et al., 2022)

		8-epiblechnic acid, brainic acid, Luteolin, apigenin, 1,2,3-propanetricarboxylic acid 2-hydroxy-, triethyl ester, and hexanedioic acid, mono (2-ethylhexyl) ester	Chloroform: IC_{50} = 37.5 ±3.0 μg/mL Ethyl acetate: IC_{50} = 8.6 ±0.5 μg/mL Butanol: IC_{50} = 10.1 ±1.1 μg/mL Water: IC_{50} = 13.0 ±1.3 μg/mL	• Antitrematocidal • Antiulcer			
Pyrrosia piloselloides	Dragon Scales	<u>Leaves</u> 5-hydroxymethylfurfural, allopurinol, 3, 5-dihydroxy-6-methyl-2,3-dihydropyran-4-one, sulfolan-3-ol, linoleic acid and β-sitosterol acetate (GCMS)	Methanol: IC_{50} = 38.94 μg/mL Dicloromethane: IC_{50} = 12.82 ±1.6 μg/mL Hexane: IC_{50} = 41.16 ±1.6 μg/mL	• Breast cancer • Anti-proliferative • Antipyretic	-no clinical data	Tumour	(M. Z. Arif et al., 2018; Kamal et al., 2021; Wulandari et al., 2013)
Nephrolepis cordifolia	Fishbone fern	<u>Root</u> No data available (only leave)				for vagina	
Rhynchospora colorata	Starrush Whitetop	<u>Leaves</u> No data		• Antibacterial (*Shigella dysenteriae*)		For vaginal cleansing	(Dewi, 2021)
Hibiscus rosa-sinensis	Chinese hibiscus	<u>Leaves</u> Carotene, taraxeryl acetate, p-sitosterol, gentisic acid, ß-sitosterol, and malvalic acids	Aqueous: IC50 = 34.5±4.65 mg/mL Methanol: IC50 =	• Antifertility properties/reproductive • Antidiabetic • Antimicrobial • Dermatological	-no clinical data (leaves)	Pus urine	(Al-Snafi, 2018; Garg et al., 2012; Khristi & Patel, 2017;

			11.85±3.01 µg/mL	• Anti-inflammatory, antipyretic, analgesic • Immuno-modulatory • Effect in colitis			Missoum, 2018)
Abelmoschus manihot	Aibika	Leaves Rich in nucleotides, nucleosides, and nucleobases	Aqueous: IC50 = 1908.48 ± 46.47 ppm 70% Ethanol: IC50 = 340.09 ± 1.02 ppm Ethanol: IC50 = 430.92 ± 0.28 ppm Ethyl acetate: IC50 = 610.11 ± 2.90 ppm Hexane: IC50 = 955.16 ± 17.73 ppm	• Anti-inflammatory, analgesic, • Immunomodulatory • Bone loss	• Diabetic nephropathy	UTI	(Luan et al., 2020; Todarwal et al., 2011; Winata et al., 2024)
Abelmoschus esculentus	Okra	Leaves Tannin, lectin, coumaric acid, caffeic acid, ferulic acid, rosmarinic acid, and catechin	80% Methanol: IC50 = 60.1±1.20% 80% Ethanol: IC50 = 58.9±0.45%	• Antibacterial • Antifungal • Tyloxapol-induced hyperlipidemia • Phagocytic activity	-no clinical data (leaves)	UTI	(Abdel-Razek et al., 2023; Ashidi et al., 2013; Guebebia et al., 2023; Hafeez, Hassan, et al., 2020; Hafeez,

			100% Methanol: IC50 = 57.3±2.48% 100% Ethanol: IC50 = 56.4±0.65%	• Respiratory burst activity • Anti-fertility			Mona Hassan, et al., 2020; Nguyen et al., 2019)
Citrus aurantifolia	Lime	Fruit Limonene, hesperidin, γ-terpinene, geranial, β-pinene, neral, β-bisabolene, myrcene, didymin, hesperetin, isolimonexic acid, limonexic acid, limonin, and ascorbic aid	Water: IC50 = 47.72 ± 0.25 % 70% Methanol: IC50 = 50.83 ± 1,65 % 70% Ethanol: IC50 = 52.24 ± 3.37 %	• Antibacterial • Anticancer • Antitumor • Anti-cholesterol • Anti-larvae • Anti-mosquito, • Antidiabetic • Anti-inflammatory • Anticholinesterase	-no clinical data	Panu/Kutu Air Respiratory, skin	(Chriscensia et al., 2020; Şeker Karatoprak et al., 2021)
Anredera cordifolia	Madeira vine	Leaves 3,5,3',4'-tetrahydroxyflavone, 8-glucopyranosyl-4',5,7-trihydroxyflavone, myricetin, morin, phytol, alpha-pinene, 6,10,14-trimethyl pentadecanone, vitexin, isovitexin, Lupeol, β-sitosterol, and ursolic acid	Methanol: IC50 = 370.26 ppm Ethanol: IC50 = 318.85 ppm	• Cure of wound • Anti-bacterial • Anti-cholesterol, • Obesity • Postpartum • Anti-diabetes mellitus • Anti-inflammatory • Anti-hypertensive • Anti-cancer • Lowering uric acid	-no clinical data	Panu/Water fleas	(Alba et al., 2020; Marina Silalahi, 2024; Sidhartha et al., 2024)

Phytochemical Studies of Kenyah Ethnomedicine

According to Table 2, a few chemical constituents from Kenyah plants were scrutinized and classified to have complete clinical studies. Curcumin with its derivatives and piperine from *Curcuma longa* and *Piper nigrum* respectively have well established clinical studies. *C. longa, Sauropus androgynus* and *Abelmoschus esculentus* have caffeic acid that has been tested in clinical studies while *S. androgynus* and *Blechnum orientale* having chlorogenic acid has also been tested. It is also worth mentioning that certain chemical constituents that are more specifically found in a particular plant namely borneal (*Kaempferia galanga*), protoberberine (*Annona muricata*), tricin (*Imperata cylindrica*), 4-methylumbelliferone (*Vernonia amygdalina*), ursolic acid (*Excoecaria cochinchinensis*), sennosides (*Senna alata*), berberine (*Coscinium fenestratum*), allopurinol (*Pyrrosia piloselloides*), limonene, hesperidin, hesperetin, mycrcene (*Citrus aurantifolia*), ursolic acid (*Anredera cordifolia*) have underwent some clinical studies. More commonly found chemical compounds that are cited in the table with clinical studies conducted are namely β-caryophyllene, luteolin, lupeol, apigenin, Squalene, Stigmasterol, sitosterol, linoleic acid, 9-hexadecenoic acid, palmitic acid myristic acid, vitamin B3, C, E and K.

Beside the aforementioned chemical compound, all the unmentioned are potential for starting in silico pharmacological screening for the chemical moieties followed by proceeding for in vitro and in vivo then finally clinical trials. For instance, major constituent like sinensetin, rosmarinic acid, and eupatorine from leaves of *Orthosiphon aristatus*; Ethyl-para-methoxycinnamate and ethyl-cinnamate from *K. galanga* root; chavicol, chavibetol,and estragol from *Piper betle* leaves; aloe-emodin, aloin, aloesin, emodin, and acemannan of *Aloe vera*; guavanoic acid and guavacoumaric acid of *Psidium guajava* leaves; Precocene I and chromene from *Ageratum conyzoides* leaves; Excolabdone, Glochidionionoside B, excoecariosides A and B of *Excoecaria cochinchinensis* leaves; rotenone of *Derris elliptica*; jatrorrhizine and palmatine of the root of *C. fenestratum*; Goniothalamin, geranyl acetate and germacrene D of *Goniothalamus macrophyllus* stem; 3-O-*β*-D-glucosyl-(1-6)-*β*-D-glucosylkaempferol of *S. androgynus* leaves; 5-hydroxymethylfurfural from *Pyrrosia piloselloides* leaves; malvalic acids from the leaves of *Hibiscus rosa-sinensis*.

Terpenes and terpene derivatives are present in every “nglidah” plant, otherwise chemotaxonomic affinity (Gollin, 2004). In particular, the plants include a-pinene, 1,8 cineole, limonene, and piperitone, which are very volatile monoterpenes (Dehsheikh et al., 2020). Citrus, citronella, black pepper, spicy, slightly mentholated, topically numbing, and occasionally coriander-and licorice-like properties are all attributed to these, and other components found in nglidah species. These plants contain volatile oils that have pharmacologic effects on human health due to their diverse range of impacts on human physiology. Their antimicrobial properties make them a promising weapon in the fight against fever and other illnesses (Chouhan et al., 2017). Their expectorant and decongestant qualities suggest they could be helpful in alleviating respiratory issues. Because of their carminative, antispasmodic, and appetite-stimulating properties, in addition to being internally and externally counterirritant, they may be excellent analgesics for pain in muscles and bones and in the intestines (Snow & Spelman, 2011).

In communities where people depend on plants for medicine, they've noticed that certain visual features of plants, like their colour or texture, often relate to how effective they are as remedies (Ryan, 2010). For instance, they might have seen that plants with a milky sap tend to help with increasing breast milk production, or that red plants often help with blood-related issues. These associations between what plants look like and how they work have become important symbols (Gollin, 2004). But here is the key, it is not just about looks; These visual cues are linked to the chemical properties of the plants (Gonzálvez & Rodríguez-Gironés, 2013). So, instead of focusing on how a plant tastes or smells, these communities have learned to pay attention to the specific chemicals inside them. For example, they might look for certain compounds that make a plant taste bitter or feel rough, because these chemicals are often associated with medicinal effects. Thus, by understanding the chemical makeup of plants, these communities can better

predict which ones will be helpful for certain health issues. Further research in this field could delve into the specific chemical compounds found in medicinal plants and their interactions with the human body. Scientists could investigate how these compounds exert their effects individually and in combination with each other, as well as explore any potential adverse reactions or interactions with conventional medications. This provides a start to research that would provide a more comprehensive understanding of the therapeutic properties of traditional plant medicines and could lead to the development of new treatments for a range of health conditions.

CONCLUSION

There have been surprisingly few ethnobotanical studies conducted in Borneo, particularly among Orang Ulu communities such as the Kenyah. Adding to a better understanding of Kenyah indigenous populations' traditional medicine practices, this study reviewed the medicinal plant traditions of the Kenyah folks and adds to the existing body of knowledge. This review backs up the Kenyah's rational choice and usage of traditional medicines, however, additional studies are required to determine the exact medicinal uses of these plants and their efficacies in treating different or the right diseases. Both the preservation of key plant species and the creation of new medications can benefit from this research. Furthermore, information regarding the social and cultural milieu in which these plants are utilized, as well as how they are incorporated into the traditional medicinal practices of indigenous communities were summarized. *Derris elliptica* is one of the 61 plant species mentioned; nevertheless, other Bornean groups have not reported using it for influenza, despite its widespread usage in traditional medicine in Kenyah. It is worth mentioning that there is zero research data for *Homalomena cordata, Nephrolepis cordifolia,* and *Rhynchospora colorata* which highlights the importance of the prospective opportunities for future research. Also, to further our understanding of the ethnomedicinal systems of the Kenyah and other Bornean communities, additional comprehensive anthropological research is required.

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The Association between Socio-Demographic Profile and Lifestyle Practices with Nutritional Status: A Cross-Sectional Study Among Seventh-Day Adventist Practitioners in Kuching, Sarawak

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ABSTRACT

The Seventh-Day Adventism recommends their followers to adopt a healthy diet, adequate physical activity, avoidance of addictive substances, fostering faith and hope to give meaning to life. This study aimed to investigate the association between socio-demographic profile and lifestyle practices with nutritional status in Seventh-Day Adventist (SDA) practitioners in East Malaysia. This was a cross-sectional study conducted among SDA members aged 18 and above between February and June 2023. The total of 323 respondents was drawn from five SDA Churches based on Kuching, Sarawak. Using questionnaires, data on socio-demographic characteristics, nutritional status, spiritual practice, lifestyle behaviours were collected. Anthropometry measurement was also taken in the survey. Data were analyzed using IBM SPSS version 29.0. The study found that SDA members have satisfactory religious beliefs and involvement. Minority were alcohol drinkers (24.1%) and current smokers (4%). About 35% of the respondents were involved in regular physical activities and mostly were obese (44%) with high abdominal obesity (67.5%). The univariate analysis showed that gender was significantly associated with nutritional status (BMI, $p=0.022$; waist circumference $p<0.001$; and waist-hip ratio $p<0.001$). The higher prevalence of BMI, waist circumference, and waist-hip ratio observed in women compared to men is associated with a combination of physiological, hormonal and lifestyle behaviours. These findings suggest the need for more effective interventions tailored to their daily routine.

Keywords: Healthy diet; Lifestyle; Nutritional status; Physical activity; Seventh-day Adventist

INTRODUCTION

Extensive studies have been published on the relationship between religion and health, highlighting how spirituality is recognized as an essential aspect of human experience that significantly impacts an individual's health and well-being (Koenig, 2012). Spiritual practices, integrated into various religious and cultural traditions, foster spiritual growth and connect individuals to a higher power or purpose (Chatters, 2000). Recently, there has been growing interest in how spiritual practice, lifestyle behaviour, and health status interrelate, particularly among members of religious communities (Bożek et al., 2020).

The Seventh-day Adventist (SDA) Church is a Christian denomination that has been known for its emphasis on healthy living and holistic well-being. The church's teachings promote a vegetarian diet, regular physical exercise, and abstention from smoking and alcohol consumption (Acosta Enríquez et al., 2019). These lifestyle behaviors are believed to be central to the church's mission of promoting physical, mental, and spiritual health. The Church believes that one's faith could be expressed through the maintenance of health as it was firmly stated that the body is the vessel of God (Mclver, 2016).

Most previous studies on religion and health have predominantly focused on samples from the U.S. and other Western countries, with only a few studies emerging from Asia (Tan et al, 2016). This current study, conducted in Sarawak, Malaysia, addresses this gap by exploring the under-researched area of spiritual practice, lifestyle behavior, and health status in an Asian context. Kuching, the capital city of Sarawak, is home to a significant population of SDA practitioners who strictly follow the church's teachings on healthy living. Therefore, this study aims to determine the association between socio-demographic profile and life style practices with nutritional status among the SDA practitioners in Kuching, Sarawak.

LITERATURE REVIEW

Religious belief and longevity are mutually reinforcing pathways. Most religions regard the body as sacred that has to be taken carefully. Therefore, they declare prohibition against certain irrelevant behaviour to human body, which can lead not only to spirituality but also health promoting ways (Tan et al., 2016). In terms of behavioural perspective, spirituality becomes an integral component of comprehensive health. Moreover, from psychological perspective, active participation in religious communities, make a person a sense of belonging which releases from stress and better coping skills (Saintila et al, 2022).

The SDA church, which began in the mid-nineteenth century in America emphasizes on holistic health, lifestyle reform and adherence to biblical principles. The Adventist health message comprises positive impact on physical, mental, emotional and spiritual health (Herrera et al., 2025). Adventists doctrines influence on mass production of plant- oriented foods, such as meat analogues, breakfast cereals and soymilk (Banta et al., 2018). The vegetarian diet was an important part of 'the present truth' i.e., the originating of the world history, starting with the vegetarian diet established in the Garden of Eden (Sanchez et al., 2016). Among vegetarian, there are sub-grouping such as vegan i.e., avoid all animal products, including dairy, eggs, and honey, lacto-ova-vegetarian i.e., consume dairy products and eggs but avoid meat, poultry, and fish, pesco-vegetarian i.e., avoid meat and poultry but eat fish and seafood and semi-vegetariani.e., eat red meat, poultry and fish less than once per week and more than once per month (Santos et al., 2025).

Numerous studies have been carried out among the Adventists to investigate the relationship between lifestyle, physical activities and health. The positive association has been found consistently in diverse samples, designs, methodologies, religious measures, health outcomes and population characteristics (Kent et al., 2015; Acosta Enríquez et al., 2019; Matsumoto et al., 2019; McBride et al., 2021). Findings from the Adventist health study 2 reflected that most Adventist have increased longevity (> 80 and above) with dietary patterns of 7.8 % were vegan, 29.2 % were lacto-ovo vegetarians, 10.2 % were pesco-vegetarians,

5.5 % were semi-vegetarians, and 47.3 % were non-vegetarians respectively. The same research declared that the behavoiural of non-smoking, abstinence from alcohol consumption, daily engagement in regular physical activity together with plant- based diet make them increased life expectancy (Santos et al, 2025). In addition, in the Multiethnic Nutrition Study in US reported that the Adventist population with vegetarian diet patterns were significantly associated with lower BMI, waist circumference and body fat mass as compared to non-vegetarians (Singh et al., 2019). Besides, a total of 4557 Peruvian university students from different religious background, among them Baptist, Catholic and Evangelical students had a significant higher BMI compared to SDA students (Lévano-Matos et al., 2024). Along with another Mexican study, explored that Adventist adolescents adhered more healthier behaviours such as less watching TV time (< 2 hours), enough sleep time (7 hours or more), go to bed early (at 11 o'clock or before) and have breakfast than non-Adventist adolescents significantly (Acosta Enríquez et al., 2019). On top of that, a study done in Loma Linda, US, indicated that diet quality index, based on the operationalization of 14 dietary and lifestyle components, of non-vegetarian had a significantly lower mean score compared to vegetarians (Le et al., 2018).

Not only in Western countries, a study conducted in Metro Manila, Philippines indicated that there was a significant association between adherence to the Adventist Health Message and health related behaviours particularly diet and physical activity (Galvez et al., 2021). Similarly, a study done in Bandung Barat, Indonesia reported that there was a significant correlation between lifestyle and life span: positive correlation with spiritual status and diet; hours of sleep at night as well as negative correlation with smoking (Malinti & Simanjuntak, 2017). Similarly in West Malaysia study reported that a higher level of religiosity was associated with a better dietary habit and vegetarian status (Tan et al., 2016).

To our knowledge, there was no evidence of SDA related lifestyle research in Kuching, Sarawak. In Kuching, it has about 189 SDA churches and approximately more than 20,000 memberships (Yearbook homepage. Sarawak mission, 2025). As such, this community provides a unique opportunity to investigate the association between socio-demographic profile and lifestyle practice with nutritional status. Therefore, conducting this kind of research can fill the gap to compare the difference socio-demographic and lifestyle significance between Eastern and Western part of SDA communities.

METHODOLOGY

Study design

A cross- sectional study was conducted among SDA practitioners aged 18 and above in Kuching division, Sarawak state, Malaysia between February and June 2023. The study respondents were recruited from five SDA Churches located at Batu Kawa, Batu Tiga, Sungai Pinang, Semaba and Bumbok respectively. All respondents were briefed and they signed informed consent. The study was approved by the Medical Ethic Committee of Universiti Malaysia Sarawak (FME/22/16).

Sample size and data collection

Sample size was calculated using Open-Source Epidemiology Statistic for Public Health (Open Epi), version 3.0 (www.OpenEpi.com), an open-source calculator, based on the sampling frame of total 1250 SDA members from five churches, with the confidence level of 95%, attrition rate of 10% and the minimum sample size needed was 320. Data was collected using face-to-face interview. Before conducting the research, the church's organizer prepared the church compound for the interview sessions and measurement session.

Sampling procedure

The study employed a multi-stage convenience sampling approach, where five distinct church locations were first purposively selected as clusters for data collection, and all eligible, willing participants available at the time of the health screening event were recruited.

Measurement

The socio-demographic, spiritual practice, lifestyle behaviour and nutritional status were gathered from a survey questionnaire that has been adapted from Tan et al (2016). The socio-demographic information included age, gender, date of birth, ethnicity, education level, employment, occupation, income, marital status, and whether the respondent was born in an Adventist family. With regards with spiritual practice, respondents were asked regarding their religious practices and perception towards religious belief. Lifestyle behaviour included consumption of alcohol, smoking habits, physical activity, vegetarian practice and dietary quality. For the current health status, it was measured by the anthropometry methods. Obesity was classified according to the following cut-off points: Normal (BMI-18-22.9), Overweight (BMI≥23), Obese (BMI>27.5). And also, waist circumference (WC) and Hip Circumference and waist-hip ratio (WHR) were taken. Normal WC cut off points are according to the following: ≥90cm for males and ≥80cm for females. Normal WHR cut-off points are according to the following: >1.0 for males and >0.8 for females (Clinical Practice Guidelines, 2023). To determine if the respondents met the recommended serving sizes by food group, a diet quality index was adopted with modifications based on Lee et al. (2011). Instead of the seven food groups used in the original instrument, the modified instrument comprised five food groups. The scoring of these components was calculated based on the recommended serving sizes and nutrient intake outlined in the Malaysian Dietary Guidelines (National Coordinating Committee on Food and Nutrition, 2010). Each food group was scored as 1 for meeting the serving size and 0 for not meeting it. The maximum possible score was 5 if all food groups were met, and the minimum score was 0 if none of the food groups were met.

Statistical analysis

The data was analysed using IBM Statistical Package for Social Science Program (SPSS) version 29. Univariate analysis was carried out to answer the research objective. To ensure the appropriateness of parametric tests, the normality of the data was evaluated using the Shapiro-Wilk test. The results showed that the data were normally distributed ($p > 0.05$), confirming the suitability of subsequent parametric analyses.

FINDINGS

A total of 323 SDA members participated in this study. The mean age of all respondents was 51.7 years old and most of them were in their middle age (31-59 years). Moreover, the majority were female (63.8%) and Bidayuh (79.9%). More than 80% of the respondents were found to be overweight and obese, 67.5% were having abnormal waist-circumference and 48.3% with abnormal waist-hip ratio. Overall, these findings indicate a high burden of obesity in this community. The detail of socio-demographic characteristics and nutritional status is presented in Table 1.

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TABLE 1: Socio-demographic characteristics and nutritional status of the respondents (N=323)

	n (%)	Mean (SD)
Age (year)		51.7 (16.45) (Min = 18; Max = 93)
Youth (15-30)	45 (13.9)	
Middle Adulthood (31-59)	157 (48.6)	
Senior Citizen (≥ 60)	121 (37.5)	
Gender		
Male	117 (36.2)	
Female	206 (63.8)	
Ethnicity		
Bidayuh	258 (79.9)	
Iban & Others	65 (20.1)	
Education Level		
No Formal to Primary Education	39 (12.1)	
Secondary Education	146 (45.2)	
Tertiary Education	138 (42.7)	
Monthly Household Income (RM) (n=217)		3,613.9 (3,791.88) (Min = 100.0; Max = 41,000.0)
B40 (≤ 4,849)	163 (75.1)	
M40 (4,850-10,959)	46 (21.2)	
T20 (≥ 10,960)	8 (3.7)	
Marital Status		
Single	57 (17.6)	
Married	240 (74.3)	
Others (Divorced, Widower/ Widow)	26 (8.0)	
Born in an Adventist Family (Yes)	248 (76.8)	
Body Mass Index (kg/m2)		27.4 (5.39)
Normal	63 (19.5)	
Overweight	118 (36.5)	
Obese	142 (44.0)	
Waist circumference		
Normal	105 (32.5)	
Abnormal	218 (67.5)	
Waist-hip ratio		
Normal	167 (51.7)	
Abnormal	156 (48.3)	

In terms of spiritual practice, most of the respondents (56.3%) attended church or other religious meeting once a week and majority (60.7%) of them spend time in private religious activities such as prayer, meditation or Bible study for more than once per week. Regarding the extent of religious belief, more than 80% of respondents felt the experiencing the presence of God in life and majority (83.6%) also really accepted that their religious beliefs are what really lie behind their whole approach to life. Overall, these findings reflect a high level of religious engagement and internalised belief among the respondents. Details of the spiritual practices is shown in Table 2.

TABLE 2: Spiritual practice by items (N=323)

	n (%)				
	More than once per week	Once a week	A few times a month	A few times a year	Once a year or less
Religious attendance (Attend church or other religious meetings)	85 (26.3)	182 (56.3)	33 (10.2)	18 (5.6)	5 (1.5)
Private religious activities (meditation, or Bible study)	196 (60.7)	72 (22.3)	36 (11.1)	11(3.4)	8 (2.5)

	Definitely true of me	Tends to be true	Unsure	Tends not to be true	Definitely not true
In my life, I experience the presence of God.	273 (84.5)	43 (13.3)	6 (1.9)	0 (0)	1 (0.3)
My religious beliefs are what really lie behind my whole approach to life.	270 (83.6)	45 (13.9)	4 (1.2)	2 (0.6)	2 (0.6)
I try hard to carry my religion over into all other dealings in life.	224 (69.3)	75 (23.2)	16 (5.0)	4 (1.2)	4 (1.2)

In term of lifestyle behavior, about one quarter of the respondents consumed alcohol in the past 12 months, and 4% were current smokers. About 35% of the respondents reported to be involved in any regular physical activities for the past 7 days. The mean score of diet quality was 1.32 (SD=1.246). Overall, these findings suggest low engagement in risk behaviour along with low levels of physical activity and diet quality. Table 3 displays the details of the lifestyle behavior of the respondents.

TABLE 3: Lifestyle behaviors of the respondents (N= 323)

	n (%)	Mean (SD)
Alcohol consumption	78 (24.1)	
Smoking status	13 (4.0)	
Physical activity (typical 7 days) *		
Often	114 (35.3)	
Sometimes	187 (57.9)	
Never/rarely	22 (6.8)	
Vegetarian		
Yes	19 (5.9)	
No	304 (94.1)	
Dietary quality		1.32 (1.246)

*Engage in any regular activity long enough to work up a sweat (heart beats rapidly)

A further analysis looking at the association of socio-demographic and lifestyle behavior with health status reported only gender reported to be the only one variable that was associated with all the three nutritional indicators (BMI, waist-circumference, waist-hip ratio). Details of the analysis is in Table 4.

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TABLE 4: Association of socio-demographic, lifestyle behavior, spiritual practices with health status (N=323)

	Body Mass Index			Waist circumference			Waist-hip ratio		
	Normal	Overweight & obese	*p* value	Normal	Abnormal	*p* value	Normal	Abnormal	*p* value
Gender									
Male	21 (44.7)	66 (31.6)	0.022*	56 (53.3)	61 (28.0)	<0.001*	110 (65.9)	7 (4.5)	>0.001*
Female	63 (55.3)	143 (68.4)		49 (46.7)	157 (72.0)		57 (34.1)	149 (95.5)	
Age									
Adult	82 (71.9)	174 (83.3)	0.210	79 (75.2)	177 (81.2)	0.242	125 (74.9)	131 (84.0)	0.054
Elderly	32 (28.1)	35 (16.7)		26 (24.8)	41 (18.8)		42 (25.1)	25 (16.0)	
Ethnicity									
Bidayuh	88 (77.2)	170 (81.3)	0.386	83 (79.0)	175 (80.3)	0.882	133 (79.6)	125 (80.1)	1.000
Iban & others	26 (22.8)	39 (18.7)		22 (21.0)	43 (19.7)		34 (20.4)	31 (19.9)	
Income									
B40	68 (81.9)	95 (70.9)	0.077	61 (81.3)	102 (71.8)	0.139	91 (77.8)	72 (72.0)	1.000
M40 & above	15 (18.1)	39 (29.1)		14 (18.7)	40 (28.2)		26 (12.0)	28 (28.0)	
Marital status									
Single & others	29 (25.4)	54 (25.8)	1.000	30 (28.6)	53 (24.3)	0.418	39 (23.4)	44 (28.2)	0.373
Married	85 (74.6)	155 (74.2)		75 (71.4)	165 (75.7)		128 (76.6)	112 (71.8)	
Alcohol intake									
Yes	25 (21.9)	53 (25.4)	0.587	18 (75.0)	41 (78.8)	0.771	39 (78.0)	20 (76.9)	1.000
No	89 (78.1)	156 (74.6)		6 (25.0)	11 (21.2)		11 (22.0)	6 (23.1)	
Practice of Vegetarian diet									
Yes	8 (7.0)	11 (5.3)	0.622	7 (6.7)	12 (5.5)	0.801	11 (6.6)	8 (5.1)	0.641
No	106 (93.0)	198 (94.7)		98 (93.3)	206 (94.5)		156 (93.4)	148 (94.9)	
Smoking									
Yes	7 (6.1)	6 (2.9)	0.234	18 (75.0)	41 (78.8)		10 (6.0)	3 (1.9)	0.088
No	107 (93.9)	203 (97.1)		6 (25.0)	11 (21.2)		157 (94.0)	153 (98.1)	
Physical activity (typical 7 days)									
Often	42 (36.8)	72 (34.4)		39 (37.1)	65.8 (34.4)		66 (39.5)	48 (30.8)	
Sometimes	64 (52.1)	123 (58.9)	0.894	61 (58.1)	126 (57.8)	0.574	95 (56.9)	92 (59.0)	0.290
Never/rarely	8 (7.0)	14 (6.7)		5 (4.8)	17 (7.8)		6 (3.6)	16 (10.3)	
Diet quality	1.40 (1.342)	1.27 (1.191)	0.351	1.33 (1.320)	1.31 (1.211)	0.861	1.29 (1.281)	1.35 (1.211)	0.673

DISCUSSION

This study aimed to determine the association between socio-demographic profile and lifestyle practices with nutritional status of SDA members and in Kuching, Sarawak. The findings showed a predominantly female sample with a high prevalence of overweight and obesity, high levels of religious engagement with strong engagement in certain lifestyle practices such as abstinence from alcohol and smoking but lower adherence to others including physical activity and vegetarianism. Gender is the only factor consistently associated with BMI, waist circumference and wait-hip ratio.

A total of 323 SDA members participated in this study with response rate of 100.9%, slightly more than estimated sample size. A detailed survey on their religious practices revealed that majority of the respondents attended church or religious meetings (82.6%) and also conducted meditation or Bible study (83%), at least once a week. This finding was consistent with Tan et al. (2016) and other SDA practices in other region of the world where engaging in prayer, bible study and religious meetings have become a common routine that define their spirituality. By regularly attending church services creates a sense of well being from social support of congregational members. This allows the more explicit health behaviour linked to the religious doctrine (Morton et al., 2017). This type of coping strategy is related with a greater intensity of positive effect and supports the individuals in finding meaning in life (Wnuk, 2024). In fact, SDA teaching shape the morality of individual in health sanatorium of the Christian Physiology. It heals the whole person by caring for the mind, body and spirit (Banta et al., 2018).

The prevalence of obesity, as measured by BMI in our study (44%), was significantly higher compared to national statistics by the National Health and Morbidity Survey (NHMS) 2019, which stated the prevalence of obesity among Malaysian adults was 19.7% (Institute for Public Health, 2019). Similarly, for waist circumference, 67.5% of the respondents were found to have an abnormal status, as well as for waist-hip ratio, where 48.3% were found to have an abnormal status. Although these three anthropometric measurements have their differences in determining nutritional status—where BMI focuses more on overall height and weight and does not differentiate between muscle and fat mass, unlike waist circumference and waist-hip ratio that give an indication of abdominal fat closely associated with the risk of metabolic and cardiovascular diseases—the findings still indicate the importance of nutritional status among this studied population, SDA practitioners.

Interestingly, in some of the studies carried out among non-SDA and SDA practitioners (Majda et al., 2021; Acosta Enríquez et al., 2019), SDA respondents presented a healthier lifestyle reflected with better nutritional status compared to their counterparts. However, this study indicated slightly different findings, where the prevalence of obesity-related indicators is highly alarming. Perhaps a closer look at the physical activity status, practice of a vegetarian diet, and diet quality may have contributed to this finding. Only 35.3% of the respondents often engaged in physical activity, in comparison with Majda et al. (2021), where the study reported a high level of physical activity (>1500 MET-minutes/week) as more prevalent among SDA respondents compared to their counterparts. Similarly, a study conducted in Sarawak reported that only about 12.6% of elderly adults were classified as physically active, it meant that the average steps/day was below the recommended levels (Saad et al, 2021).

In terms of vegetarian practice, only 5.9% of this study's respondents practiced a vegetarian diet. Although vegetarianism is encouraged in SDA, these practices are not compulsory. It was reported that studies carried out in other countries had higher prevalence of vegetarian among SDA practitioners, ranging from 7.7% to 35.5% (Orlich & Fraser, 2014; Butler et al., 2008). In terms of diet quality, a mean score of 1.32 (SD=1.246) was reported, indicating many of the respondents did not routinely fulfil the dietary requirements set by the Malaysian Dietary Guidelines. One of the possible factors for poor dietary index may be due to a large percentage (75.1%) of SDA participants in this study fell into the B40 income

category, which might have an impact on choice of quality food. According to research conducted among B40 household in Malaysia, 80% of B40 households' income is spent on routine essential (Applanaidu et al 2022). Even though local people of Sarawak cook the food using the natural resources from the forest such as wild animal meat, fish, shoots, stems, leaves, roots, barks, and many others, these practices are more characteristic of rural lifestyles (Ting et al, 2017). Additionally, rapid industrialisation and changes of lifestyle pattern trigger food consumption patterns shift away from traditional local staples towards highly processed, often imported, food (Goh et al, 2020). It was suggested that lower diet quality index scores may not reflect adherence to SDA teaching, in fact it was influenced by structural and environmental context. Moreover, a detailed 24-hour diet recall would definitely help in giving a clearer explanation of this finding. However, this was not covered in the study.

About 76% of the respondents reported not consuming any alcohol in the past 12 months, consistent with other studies (Tan et al., 2016; Galvez et al., 2021) where the majority of their respondents reported not consuming any alcohol. In addition, only about 4% were active smokers, which was lower than the previous North American SDA study of 8% (Charlemagne-Badal & Lee, 2016). Moreover, this study's smoking status is quite lower than the prevalence of smoking in Malaysia, which is 22.8% (Lim et al., 2018). The low rate of alcohol consumption and smoking is believed to be influenced by the SDA church teachings. It was suggested that higher religious involvement strengthens and adherence to health-promoting behaviours (Lim & Putnam, 2010). Thus, observed lifestyle pattern in this SDA sample may reflect the stronger communal and religious characteristics of East Malaysia SDA. In addition, the possibility of paradox pattern in this study is due to the fact that alcohol and smoking are strong prohibition of SDA while vegetarianism and physical activity are interpreted as advice not prohibition (Banta et al, 2018).

The univariate analysis between socio-demographic and lifestyle behavior with nutritional status revealed that only gender was significantly associated with nutritional status (BMI, $p=0.022$; waist circumference $p<0.001$; and waist-hip ratio $p<0.001$). The higher prevalence of BMI, waist circumference, and waist-hip ratio observed in women compared to men is associated with a combination of physiological, hormonal, lifestyle, cultural, genetic, and health-related factors (Davis et al., 2012; Wells, 2007; Lovejoy et al., 2008; Kant & Graubard, 2006). Women naturally have a higher percentage of body fat compared to men. This is partly due to reproductive functions and the need for fat storage in areas like the hips, thighs, and abdomen. Women also generally have a slower metabolic rate, which can contribute to higher body fat accumulation over time. In addition, the majority of the respondents in this study were aged 50 and above, closely linked to menopause, which results in a reduction in estrogen and metabolically unfavourable fat redistribution from gynoid to abdominal locations (Kozakowski et al., 2017).

In this study, several variables were not significantly associated with nutritional indicators, including age, ethnicity (with majority were Bidayuh), income, marital status (majority married), alcohol intake, vegetarian diet, smoking, physical activity and diet quality. The possible reason for these non-significant findings may be due to the homogeneity of sample in one specific regional area with similar characteristics such as the predominance of one ethnic group, similar income levels, a high proportion of married participants, as well as generally low prevalence of of smoking and alcohol consumption. Additionally, self-reported measures of physical activity and diet quality may have limited sensitivity to detect subtle differences.

CONCLUSION AND LIMITATION

This study highlights several important findings regarding the nutritional status and lifestyle behaviors of Seventh-day Adventist (SDA) practitioners in Kuching, Sarawak. The prevalence of obesity, as measured by BMI, was significantly higher in this population compared to national statistics. Additionally, a substantial proportion of respondents exhibited abnormal waist circumference and waist-hip ratio,

indicating a high risk of metabolic and cardiovascular diseases. The study also revealed that a majority of respondents abstained from alcohol consumption and smoking, which aligns with the teachings of the SDA church. However, the low levels of physical activity and limited adherence to a vegetarian diet among respondents may have contributed to the high prevalence of obesity-related indicators.

Gender was found to be significantly associated with nutritional status, with women exhibiting higher BMI, waist circumference, and waist-hip ratio compared to men. This can be attributed to a combination of physiological, hormonal, lifestyle, cultural, genetic, and health-related factors, as well as the age-related impact of menopause.

Despite these findings, the study has several limitations. The sample was limited to SDA practitioners in Kuching, Sarawak, which restricts the generalizability of the results. Additionally, the cross-sectional design of the study only provides a snapshot of behaviors at a specific point in time, and the potential for social desirability bias in questionnaire responses may have affected the accuracy of the data.

RECOMMENDATION

Overall, the study underscores the importance of addressing nutritional status and promoting healthier lifestyle behaviors among SDA practitioners. This study recommended incorporating locally available Sarawak plant-based nutrition education activity into routine church programs alongside group-based physical activity projects. In addition, it should be collaborated with local health authority for health education programme regularly. Therefore, it can strengthen non-communicable disease prevention efforts in Sarawak's indigenous and rural communities. Future research should consider a more diverse sample and longitudinal design to better understand the factors influencing nutritional status and to develop targeted interventions for improving health outcomes in this population.

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Rivers and the Penan Landscape[1]

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ABSTRACT

Keeping clear of polemology or irenology theories and the various explanations tendered about religious reasons for tribal war and headhunting practices, as well as of recent international conflicts, this essay describes the general Borneo setting and the particular situation of the Kapit-and-Baleh region as the meeting point of five of the island's major river basins. In an attempt to uncover features common to the island as a whole, it first focuses on its heartland, and examines the customs or adat relative to waging war and restoring peace among traditional peoples of the interior. Then, in a diachronic perspective, it tries to figure out how these peoples' assumed autochthonous methods of conflict prevention and resolution changed across historical periods, from pre-colonial times, insofar as they can be properly identified from both interviews with local people and data from the extant literature; via innovations progressively introduced by contact with and influences from coastal ("Malay") societies; to the sweeping effect of the colonial states' administrative policies; and the subsequent powerful impact of modern national (or State) societal practices and legal procedures. While the last phase has led to the local development of new forms of written adat corpuses, this essay also points to some other post-independence developments, and to what may remain today of ancient patterns regarding conflicts, their prevention, and their resolution.

Keywords: Pena; Belaga; Baram; rivers; narrative

INTRODUCTION

No Penan community underestimates the importance of rivers and that this extends beyond essential ecosystem services. Rivers provide them the framework upon which they organize their knowledge of the geography of the landscape, and the location and identity of their settlements. A place where one was born or where one's parents and grandparents were born is referred to as oko bu'un (place of origin), conferring one with an identity and rights to the place and access to its resources. It also helps connect one to kinfolks living far away or in different parts of the landscape.After providing succinct background information on the colonial and post-

colonial history of Kalimantan (see fig. 1), this essay reviews the development of second-generation museums (state museums) in independent Indonesia, and the state's policies regarding culture and museums.

Describing the Penan Gang landscape in Belaga District, Brosius (1976:174-5) says that "a conspicuous feature of the Penan environment is rivers". He further points out that:

> The importance of rivers to the Penan can scarcely be underestimated. In an environment where visibility seldom exceeds 200 [feet], these rivers and streams form the skeleton around which environmental knowledge is organized…When travelling in the forest, Penan are always cognizant of their precise location relative to various rivers. This keen sense of spatial relationships derives from an awareness of the relative size of rivers, the angle of flow from one river to another, topography between particular rivers, the proximity of headwaters of different rivers, and other sorts of environment cues.

Numbering 21,367 people, the Penan occupy largely the remote headwaters of Sarawak's large rivers, such as the Rejang, Baram, Limbang, Kemana and Jelalong, in the deep interior of the Borneo rainforest.[2] What follows is a narrative of the cultural significance of rivers to Penan society.

Navigating the landscape

The Penan frequently travel into the deep forest to hunt, collect rattan, process sago, or in search of essential resources such as agarwood (gaharu) or medicinal plants. Weaving their way through the forest, Penan would use the river system to determine their precise location relative to hills and other landmarks. It should be noted that Penan knowledge of rivers and streams is phenomenal (Brosius 1986: 174-175). Practically all rivers and streams, big and small, found within the area they live in is known to them and given names. They know which rivers and streams share watersheds, and the direction they flow into bigger rivers. Rivers are akin to streets in the urban setting, and when an individual gets disoriented in the forest, the first thing he does is walk to the nearest river or stream and work out his location, utilizing his knowledge of the orientation of the river, its flow into another river, and the proximity of the watershed it shares with yet another river. This anecdote show how important rivers are to Penan in determining locations. I had, in the early 1980s, two Penan guests staying with me in Kuching for about two weeks. The older of them was appalled to find out there were no streams cutting through the city and wondered how city dwellers find their way from one place to another.

Identity and settlements

Some groups of Penan identify themselves with the name of the river they reside. For example, the Penan Selungo and Penan Silat in Baram District, Penan Geng in Belaga District, Penan Jelalong in Sebauh District refer to themselves by the respective rivers they live in.

Around 1898 some families of Penan from Belaga District moved to the Silat River in Baram District and identified themselves as Penan Silat (Needham 1953:74-5). Today there are four Penan Silat settlements in the Silat River: Long Jekitan, Long Tikan, Long Bee, and Ba Purau. Each of these groups have exclusive rights to the land in the area they occupy. As an example, the Penan of Long Jekitan have exclusive rights to land along the Jekitan as well as around its confluence with the Silat. Identification with a particular river system gives the community rights to the land and the resources found in it.

Rivers are not merely rivers; they have stories to tell, and they record historical events. Asai Beret, the headman of Long Siang on the Tutoh, Baram District, mentioned that two right bank tributaries of the Marong, itself a left bank tributary of the Tutoh, not far downriver to the settlement of Long Siang were

named after historical events of inconsequential weight. For instance, Ba Pepak Telo (Broken Quiver River) got its name after a hunter whose quiver mysteriously disintegrated while on a hunting trip. While Ba Bavui Megu (Hairless Wild Boar River) was named after a hunting party caught a hairless wild boar.

A river or a stream may be named after the feature of the landscape, for example, a species of tree or plant that grows along its bank, a particular type of animal or bird found along its course. Asik Nyalit, the former headman of a band of nomadic Penan on the Ubong, a true right bank tributary of Tutoh, said that a tributary of the Ubong that his band frequently camped in is named Ba Bateu Bala or Red Stones River due to the red color of numerous stones found along its bank. Back to the Marong River, Asai Beret, said that a true left bank tributary of the Marong is named Ba Jakah as jakah palm (Arenga undulatifolia) grow abundantly along its banks. A right bank tributary of the same river is named Ba Tevaun, after the numbers of helmeted hornbills (tevaun) which frequent the area.

The Penan of Long Belok in the upper Apoh River named a tributary below their longhouse Ba Adin[3] or Hudden River, after Donald Hudden,[4] a popular District Officer, Baram, during the reign of Vyner Brooke, the Third Brooke Rajah of Sarawak. Ancestors of the Penan of Long Belok were camped at that river when Hudden paid an official visit. Oral narratives suggest that it was an ordinary visit by a government official, but because of Hudden's reputation, their ancestors decided to name the river after him. Years later, that visit of the District Officer was used by the Penan to assert territorial rights to the area in a land dispute with a neighboring longhouse.

Parts of rivers such as rapids (diham), pools (levahau) and so on are also named. Just below the confluence of Kuba'an and Tutoh is a lovely pool with lots of fish. The Penan in the area call it Levahau Jabu (Jabu's Pool) as they chanced to see the high-ranking government official cast his net there, while on an official visit to the area.

The Penan have a strong prohibition against mentioning the names of recently deceased persons. When an individual dies, he or she is designated with a name of the river where he or she died and buried. His or her name is then prefaced with either Lake' (male) or Redu (female). In 2017 Tabaran Agut, the highly respected headman of a band of nomadic Penan living in the Tepen River, a true right bank tributary of Tutoh died in Limbang Hospital, and he was buried in the Kelabit cemetery at Long Seridan. Tabaran was born in the Tepen River and lived all his life there, and although he was not buried in the Tepen River, the Penan community in the area remember him as Lake' Ba Tepen or the gentleman of the Tepen River.

In the second half of the 1980s and the whole of 1990s he led his band of nomads to erect a series of blockades along the logging roads leading to the Tepen River to prevent timber companies from encroaching into the Tepen area. Although his anti-logging blockades did not completely save the Tepen from environmental damage, it reduced the extent of destruction. In 2018 while accompanying the head of the WWF-Malaysia Kuba'an-Puak Green Corridor project to look at the condition of the bridge crossing the Tepen River, Asai Beret, the Penan headman of Long Siang, looked at me as I fixed my eyes to the river for a long time. He asked what was in my mind. I replied, "a great friend, Lake' Ba Tepen, who is no longer with us". Asai said he missed Lake' Ba Tepen a lot, his smile, his wit, his friendship. In Asai's numerous travels in the area searching for gaharu (agarwood), Lake' Ba Tepen and his band had shared many meals with Asai and given him shelter while passing the Tepen River. The site of the Tepen River also reminded Asai of the years he and Tabaran worked together to lead the Penan to erect barricades across the logging roads to stop logging activities in the upper Tutoh.

Oko bu'un (place of origin)

The Eastern Penan have a term oko bu'un or place of origin, from the word oko=place, and bu'un=beginning which they use in a variety of ways (Langub 2011:98). Rivers or river systems are referred

to as *oko bu'un* or place of origin. For instance, an individual can say that: "*oko bu'un ki tong Ba Puak,"* or "my place of origin is the Puak River," a tributary of the Tutoh River. Such a statement is made to assert one's rights to one's birthplace. One can also asserts one's rights to places where one's parents or grandparents were born in and connect relationships and kin ties. For instance, Asik Nyalit of Ba Ubong, Michael Ayu of the Lower Magoh, Sabin Libak of Upper Kuba'an, Igu Agan of Upper Magoh, and Jeffrey Moyong of Ba Puak can say that the area around Batu Lulau on the Tutoh River is *oko bu'un* of each of them since their great grandparents, Kei and Woh (see Figure 1) were born there.

Asik Nyalit of Ba Ubong (#1), Michael Ayu of Long Leng (#9), Sabin Libak of Ba Medamut (#12), Igu Agan of Long Tarum (#5), and Jeffrey Moyong of Ba Puak (#3) are either first or second cousins (see Figure 1), being descendants of three brothers, Ta'ang, Usai and Tring. They are spread across the length and breadth of the land between Kuban River on the west, and Ubong River on the east bordering with the Mulu National Park. They are far from each other.

Ta'ang and his wife Buring had several children, one of whom was Ayu, father of Michael. Ta'ang who died in what is now the Mulu National Park, and was buried at Batu Kejau, below the confluence of the Tutoh and Ubong. His grandson Michael lives at Long Leng in the Lower Magoh.

Usai and his wife Ludang had several children, including the three shown in Figure 1, two daughters, Ulau and Seling, and a son Moyong. Usai died at Batu Lulau, located on the true left bank of the Tutoh, across from the confluence with Kuba'an, and was buried there. Ulau moved to the upper Kuba'an upon her marriage to Libak Usang. They have several children, and a son, Sabin, who is currently the headman of Ba Medamut (#12). Moyong remained in the Tutoh, establishing a settlement at the confluence of the Puak and Selulong. He married Pengiran Jeluran, and they have several children, one, Jeffrey, is the current headman of Ba Puak (#3).

Tring and his wife Tilung had several children, one of whom was Re'. Tring died at the headwaters of Ba Puak and was buried there. Re' moved to Ba Ubong upon her marriage to Nyalit. They have several children, one of them Asik, who used to be the headman of Ba Ubong (#1), but now in old age living at Ba Mera'an on the Magoh to be close to the government rural clinic at the Kelabit village of Long Seridan.

As can be seen in the Map (Figure 1), descendants of the three siblings, Ta'ang, Usai, and Tring, are spread across the length and breadth of the area between Mulu National Park on the west and Pulong Tau National Park on the east: Sabin in the east, Asik in the west, Igu north, Jeffrey south, and Michael in the middle. Their parents and grandparents used to meet each other quite often at the government supervised *tamu* (barter trade) meetings between the Penan and longhouse dwelling traders at two locations on the Tutoh, Long Melinau, in the vicinity of the Mulu National Park and at Long Mutan an upriver tributary of Tutoh.[5] Today, the descendants of the three siblings continue to build relationships and kin ties between themselves largely through their shared *oko bu'un* in their great grandparents, Kei and Woh.

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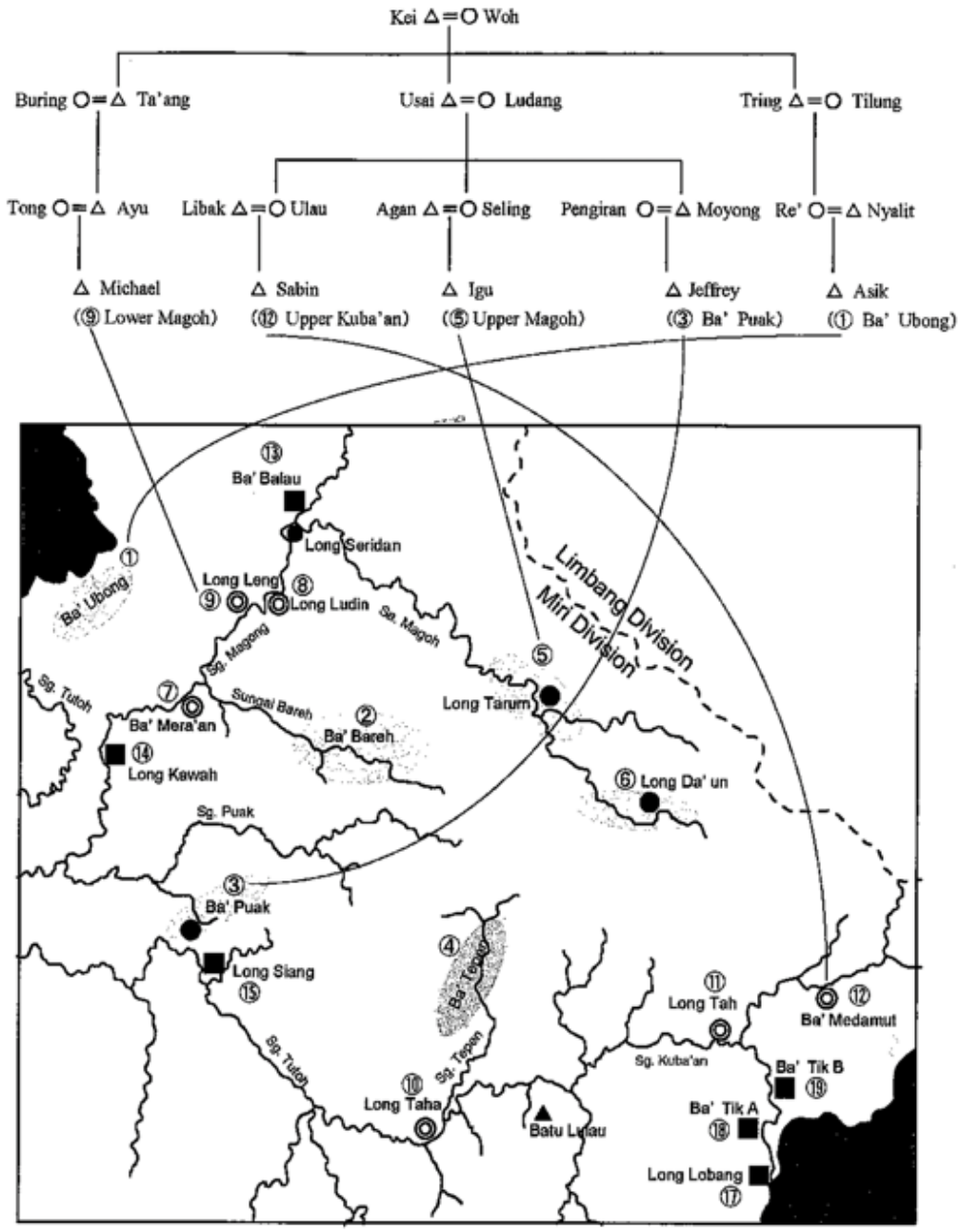

FIGURE 1: Kinship across river systems in Baram District. (Taken from Langub 2011.)

Wild sago and water resources

Wild sago, especially the species called *uvut (Eugeissona utilis)* is an important food resource for the Penan. In fact, it is still the staple food for Penan who have settled down as far back as the 1970s. Wild sago is a palm tree and grows in clump. The Penan have a tradition of laying claims to all sorts of resources in the forest they live in. This practice is known as *molong. Molong* not only lays claim to a resource, but most importantly it is a means to foster it for the future. For example, when an individual *molong* a wild sago clump, he will extract the mature sago and conserve the bud for the future. Sago palm and land-based resources, such as rattan, are owned and managed through the system of *molong*. This system of stewardship

can be done individually or communally, but the underlying principle is the same, sustainable utilization and management.

To process wild sago into food, the palm trunk is cut into sections and the pith is removed (see Figure 2). This is transferred to a rattan mat and clean river water is added to separate the starch from the pith (see Figure 3). This is left for 30 minutes while the water drains through the rattan mat, leaving behind the starch residue (WWF-Malaysia 2018: 73-75). Clean water is necessary to ensure that impurities are not left behind in the starch that is the staple food for the Penan.

Logging of the upland dipterocarp rainforests reached the Penan communities in the late 1980s and continued through the 1990s. Prior to this, the isolated Penan communities lived within and in balance with the resource-rich forests. The arrival of logging companies brought with them numerous problems, particularly soil erosion and pollution of rivers and stream.

FIGURE 2: Splitting the sago palm trunk and chipping the pith out of the trunk. Photo credit: Henry Chan

FIGURE 3: Trampling the sago fiber to separate the starch from it. (Note: The river that is providing the water for processing the sago must be clear and running to ensure that the flour is no contaminated.) Photo credit: Henry Chan

Communities decided to use blockades of logging to draw the attention of the outside world, especially owners of timber companies and the government authorities the importance of clear, clean river to process their staple food, wild sago. This was highlighted in a dialogue in April 1987 with a group of Penan manning a timber blockade at Sungai Layun in Baram District. One of the Penan elders told the Resident of Miri Division and a group of senior civil servants ac companying him, that one cannot process sago in polluted water as mud particles get into the flour.[6]

A month after the meeting with the Penan at the logging road blockade at Layun River, in May 1987, Gary Tay, the Divisional Development Officer for Miri Division, David Kala, a Sarawak Administrative Officer attached to the District Office Marudi, and I visited four nomadic bands of Penan manning a logging road blockade at Long Kidah on the Magoh River, a tributary of the Tutoh. The four bands comprised the Penan of Long Lesuan under the leadership of Kurau Kusin who gave a moving speech at the blockade site on the Layun River a month earlier; the Penan of Long Lesuan under the leadership of Wee Salau; the Penan of Ba Ubong under the leadership of Asik Nyalit; and the Penan of Ba Tepen, under the leadership of Tabaran Agut.

When we reached the blockade camp at Long Kidah, a few of the lean-tos were empty as the families who owned them were out in the distant hills processing sago to feed the people manning the blockade. We were accommodated in one of the empty huts.

The following day, one of the band leaders, Kurau Kusin brought us to see the people processing sago in one of the hills some distance from the blockade camp. The journey was quite challenging along the footpath where logging activities had taken place. The footpath was blocked with fallen tree branches felled into logs. All the streams along the footpath in the logged area were polluted. As we got into the area where logging had not taken place the walk became pleasant and smooth going. We climbed another hill and reached the camp where a small group of families was processing sago. There were probably about three lean-tos, to accommodate the workers. Kurau Kusin reminded us again that sago had to be processed in clean water; one could not process it with polluted water as mud particles would get into the sago flour. As the Magoh area was under logging license Penan had to go deep into the forest where logging had not taken place to find clear running water to process sago. This is the reason why this small group of families had to go far from the blockade campsite to look for a clear stream. Our trip to observe the processing of sago was much appreciated, because we could confirm the two major points made by community leaders with respect to the need for clean rivers. It was difficult for the communities to find unpolluted rivers and streams in logging operation area, but that clean running water is essential when processing sago

Rivers and streams: source of fish protein

Rivers and streams are an important source of fish protein. The Iban have a system *tagag* (which literally means to restrain, to hold back or prevent) of conserving fish resources in the rivers (Department of Agriculture 2020). Traditionally *molong* is the Penan term applied to sustainable utilization of land resources, but not for rivers because of the abundant stock of fish. Currently the Penan communities, under the WWF-Malaysia Kuba'an-Puak Green Corridor, are applying the *molong* management system to rivers and streams, especially sizable pools, *levahau.* The word *molong* carries the idea of respect and adherence.

CONCLUDING REMARKS

To say rivers are important to the Penan communities is an understatement. They are part of life providing the landmarks to signpost journeys through their territories when they are in search of food. They are needed to process their staple food, sago and to provide the much need protein source. They remember their history and kinfolks via the rivers as these events are embedded in the landscape. One can say that rivers connect the communities to each other and their past.

ENDNOTE

1. My understanding of the cultural significance of rivers to the Penan is derived from numerous conversations with a number of Penan since the early 1970s. I owe a great debt to the following individuals, some of whom have passed away: Usang Japi of Long Urun, Belaga; Kurau Kusin of Long Lesuan, Magoh River, Baram; Wee Salau of Long Ludin, Magoh River, Baram; Asik Nalit of Ubong River a tributary of the Tutoh River, Baram; Tabaran Agut of Tepen River, a tributary of Tutoh River, Baram; and Asai Baret of Long Siang, Tutoh Baram.

2. Information on Penan population provided by Ezra Uda, Principal Assistant Director, Economic Planning Unit, Sarawak vide his email dated July 15, 2020.

3. The Penan pronounce Hudden's names as 'Adin', hence 'Ba Adin' or Hudden River.

4. Alastair Morrison (1993) in his *Fair land Sarawak: some reflections of an expatriate official,* Cornell University, Southeast Asia Program, Studies on Southeast Asia No. 13, pp. 82-3 describe Donald Hudden as "the best DO [Baram] District ever had".

5. See Jayl Langub 2013:178-92 *"Tamu:* instutionalized barter trade, the Penan and their encounter with the colonial and post-colonial state" for a detailed description of *tamu* of barter trade.

6. We were at the blockade site from April 29 to May 2, 1987, listening to Penan expressing their grievances and frustration over logging activities causing landslides and polluting streams and rivers. The blockade at Layun River, a true left bank tributary of Tutoh, was the biggest in Baram District. Ten Penan settlements from Tutoh, Patah, Akah, Magoh and Kuba'an Rivers built temporary huts around the blockade.

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Journal of Borneo – Kalimantan

Out of Borneo
Provenance and Materiality of Objects from Borneo in the Wunderkammer at the Halle Orphanage: International Comparative Perspective

Papers presented in the interdisciplinary digital workshop organized by the Francke Foundations, 2 April 2025.

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ABSTRACT

The Wunderkammer of the Francke Foundations (Halle, Germany) is an 18th-century museum space. However, the collection also possesses a vibrant and evolving history in the 19th century. This includes the fascinating and complex story of objects from Borneo, sent to Halle in the 1840s – a history now situated within current scholarly debates and postcolonial research. A project funded by the German Lost Art Foundation is conducting an in-depth provenance study of these objects between 2023 and 2026. On 2 April 2025, an international workshop brought together experts from institutions in Germany, the United Kingdom, and Malaysia to share research findings and perspectives on Bornean collections held in various countries, as well as on the broader history of collecting objects from Borneo. The workshop explored specific themes and research questions concerning individual collection items, focusing on their original meanings and uses, as well as their significance within the history of collecting in Borneo. These discussions enabled the identification of connections among the various collections, within which the objects housed in the Wunderkammer of the Francke Foundations can be situated as part of one of the earliest known collections.

Keywords: Cultural Heritage; Ethnology; International Collaboration; Object Histories; Provenance Research

INTRODUCTION – THE FRANCKE FOUNDATIONS AND THEIR *WUNDERKAMMER*

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FIGURE 1: Aerial view Francke Foundations (photo: Horst Fechner).

The Francke Foundations in Halle in eastern Germany bear unique testimony to social and educational architecture constructed by a civil society initiative in the European Baroque period. The ensemble's significance as purpose-built school and welfare architecture has been deliberately infused with the Christian Pietist idea of comprehensively educating individuals from all walks of life to promote a fundamental social reform.

FIGURE 2: Coloured historical aerial view/Historic Orphanage (AFSt/B Sa 0053/detail from AFSt/B Sd 0002).

The Francke Foundations were established in 1695 as a school for the poor and an orphanage by the theologian and educator August Hermann Francke (1663–1727), one of the leading figures in global Pietism – a Protestant reform movement. In a few decades the Foundations developed into a building ensemble which comprised: numerous educational institutions and schools (including higher education in the Latin School and the Royal Paedagogium), the East Indian Mission, a Bible Institute, an ever-growing collection of teaching materials including the Library and the Cabinet of Artefacts and Natural Curiosities, as well as production facilities such as pharmacy, printing workshop, publishing house, farms and agricultural enterprises. The building ensemble express the idea of fundamental social and educational reform through a systemic change in welfare away from the provision of alms towards combatting poverty through education for boys and girls. The Foundations formed the heart of a global correspondence and action network designed to disseminate Halle Pietism's ideas for reform.

Within these far-reaching activities, the Foundations were the starting point for the first sustainably organised Protestant mission on the East coast of India, supported by the court in Copenhagen in Denmark and the Society for Promoting Christian Knowledge in London. This mission context is the background for the Borneo activities.

FIGURE 3: The Cabinet of Artefacts and Natural Curiosities (photo: Thomas Meinicke).

The Cabinet of Artefacts and Natural Curiosities was designed in the years 1736–41. It can still be visited today in its original location in the lower part of the mansard roof of the Historic Orphanage. It was organized to display the macrocosm within a microcosm. The Cabinet – which is named after the early modern umbrella term Wunderkammer – is important for the history of the museum as it is the only surviving cabinet of curiosities of civil origin from the early modern era, complete with its setting of objects, cabinets, historical inventories, instructions, within the original museums space.

The Wunderkammer also has various unique features – one is the so-called Malabarian Cabinet with objects from southeast India. The missionaries sent to India had the task of collecting objects of Indian culture and nature, describing them and sending them back to Halle. During the 18th century a large amount of knowledge was established, which found its expression in this cabinet. This had a substantial impact, as the Wunderkammer in the 18th c. was open to the public with two guided tours a day. Therefore, the objects from India served multi-layered purposes. In addition to collecting knowledge from and about India, the objects became evidence of the allegedly superiority of the Christian faith and of the supposed progress of the mission in order to collect donations for it.

Following on that missionary activity in 18th-century South India, in the 19th c. the Francke Foundations director Hermann Agathon Niemeyer (1802–1851) sent two missionaries to Borneo. Part of their activities was to acquire objects and to send them back to Halle, explicitly following the practice of collecting objects by the missionaries in South India during the 18th century.

The intention was to exhibit these items as well as to give public visible testimony of the continuation of missionary activities and the allegedly dominance of the Christian faith. Furthermore, they served for the accumulation of knowledge on Borneo. Hence, a strong exchange with the University of Halle has been established in the 19th c.; this is a field of post-colonial research, which is conducted by Thomas Ruhland (Halle). A display cabinet was made to hold the objects. The objects were (and are) displayed in the cabinet itself and on the outside walls of the Wunderkammer.

Currently a project at the Francke Foundations researches the provenance of the objects. The project is funded by the German Lost Art Foundation, Department of Cultural Goods and Collections from Colonial Contexts. It aims to contribute to the historical deep structure of the relations between European colonialism, missionary activities,

and collecting practices. To conduct those goals the project establish cooperation with several institutions and scholars from Germany, Europe, and Borneo. This process of academic networking und exchange was the background as well as the goal of the workshop. Therefore, the workshop focussed on provenance and materiality, on different collections holding objects from Borneo for comparisons, and addressed specific groups or clusters of objects.

'REMINISCING THE EARLY DAYS', EARLY SARAWAK MUSEUM COLLECTIONS

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The Sarawak Museum's history began with the establishment of Sarawak, and therefore, intrigued countless scientists, researchers, artists, and other foreign interests to come and satiate their curiosity. Numerous maps and publications have indicated the geographical location of Sarawak. Few maps indicate the location of Sarawak, which is also published in books.

The Sarawak Museum was established in 1886, and this year marks its 139 years of operation. On 4th August 1891, the official building was completed and housed mainly ethnological and zoological collections for display. The exact motivations behind the museum's establishment remain unclear. Although several missionaries and scientists had arrived in Sarawak earlier to collect specimens and artefacts to take back to their home countries, the Sarawak Museum Journal of 1983 and other research papers noted the significant influence of Alfred R. Wallace, who visited Sarawak between 1854 and 1856.

The establishment of the Sarawak Museum was largely attributed to the Second Rajah, Charles Brooke, who expressed his intention to create a museum in the Sarawak Gazette on March 26, 1878, stating, "His Highness the Rajah intends on a future day to establish a Museum for all specimens of interest in this country, for which a suitable building will be constructed at Kuching by the Government." A few years later, the official building was completed.

The initial building where the collections were located and displayed was in Astana, and above the market at the main bazaar street. Following the completion of the Sarawak Museum in 1891, the collections were relocated there and have remained ever since. The building has undergone a series of renovations, the most significant of which was in 1911 and in 1945, it was painted white from its original brick colour and has maintained its look to this day. (Chin et al.,1983)

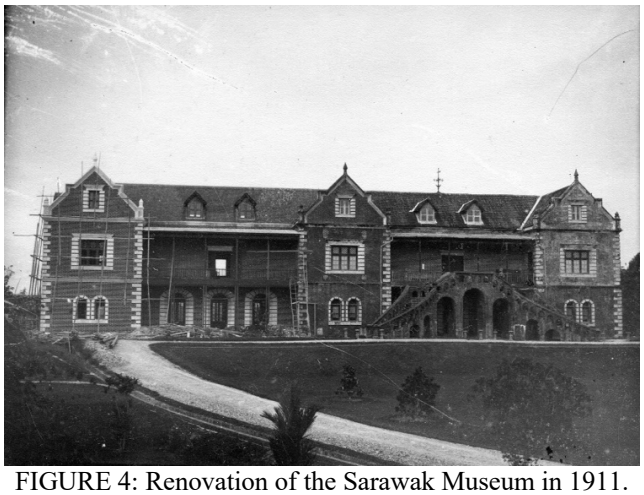

FIGURE 4: Renovation of the Sarawak Museum in 1911.

One of the earliest collections displayed was acquired from Hugh Brooke Low, known then as the Brooke Low collection, where the Sarawak Museum bought the 'nucleus' ethnography collection as a start. There are also artefacts collected by Charles Brooke himself, like the Sulu cuirass and other Sulu items. (Morris, J.R., 2019) Along with that, the zoological specimens were also part of the early collections, collected through fieldwork and donations from various parties, with early curators being the largest contributors at that time.

According to the museum catalogue, a total of 649 artefacts from the Brooke Low collection were first recorded in 1891, coinciding with the establishment of the Sarawak Museum building. Hugh Brooke Low, the son of Sir Hugh Low, received an education in Europe and then served Sarawak under the second rajah for 18 years, primarily stationed at the Rejang River, which reflects the origin of his collections (Roth, H.L., 1896).

His documentation on his collections was then compiled and published by Henry Ling Roth in "The Natives of Sarawak and British North Borneo, Vol. I and II". The types of collections reflect daily and ritual items, predominantly sourced from the Rejang area. Many of the items are of Melanau origin, including the first ever item: a woven basket that remains in excellent condition at the Sarawak Museum. There are several Brooke Low collections residing in the Sarawak Museum, and some of them appeared in the book with illustrations, with similar descriptions as in the catalogue book. Among those mentioned in the book with descriptions from the Sarawak Museum old catalogue book are "50. Dyak gasieng inggar, noisy spinning wheel" (Figure 5), "32. Kaian 'abat'., baby's chair carved and studded with ground shells. It is worn slung over the back" (Figure 6), and "20. Tepoko, Kanowit basket. Pattern 'seraiong bedukan' or 'sulow' (a perforated disc) cf also war coats and mabat" (Figure 7). Other duplicate items featured are tattoo blocks, Melanau items, and others.

FIGURE 5: Roth 1896 (Vol II), p. 31/Spinning wheel, Borneo Cultures Museum, 2025.

FIGURE 6: Roth 1896 (Vol I), p. 100/Baby carrier, Borneo Cultures Museum, 2025.

FIGURE 7: Roth 1896 (Vol I), p. 364/Kanowit basket, Sarawak Museum, 2025.

As for the zoological specimens, G.D. Haviland recorded in 1892 that the Sarawak Museum housed 81 species of mammals, 250 species of birds, 5 species of tortoises, 25 species of lizards, 80 species of snakes, and quite some insects and amphibians. Also, four (4) large cases comprise maias (orangutan), gibbons, leaf monkeys, and hornbills. (Cranbrook et al., 1983)

From this, it is evident that a substantial number of zoological specimens have been collected, with the earliest specimens recorded between 1889 and 1891. One of the early contributors was Charles Hose, a Brooke officer from 1884 to 1907, who is also the author of "Pagan Tribes of Borneo (Vol. I and II)" in 1912.

To date, the Sarawak Museum currently houses 402,256 collections, encompassing not only zoological and ethnological specimens but also archaeological artefacts, archival materials, photographs, and audio-visual collections. In the near future, comprehensive documentation of the history will be undertaken, detailing their origins and establishing a precise timeline. For now, the Sarawak Museum remains committed to preserving its extensive collections, which date back nearly 150 years, for future generations and the world.

EXPLORING THE BORNEO COLLECTIONS AT THE BRITISH MUSEUM

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The UK's largest cultural collection from Borneo, numbering more than 4000 objects and several hundred photographs, is housed at the British Museum in London. The majority of these were acquired between the 1880s and 1980s, coinciding with the peak of British involvement in Borneo, but have been under-researched and underutilised for most of their time in the museum. Currently, only a handful – mostly Melanau belum (often translated as 'sickness/healing images') from Sarawak – are on public display. From 2024 to 2026, however, the 'Interpreting Borneo in Britain' project, funded by UK Research and Innovation's Arts and Humanities Research Council, has been conducting an in-depth historical analysis of the collection and collaborating with stakeholders in Borneo and the UK to rethink its documentation and interpretation.

Although the British Museum collection represents all three contemporary Borneo territories, more than half of the 4000 objects were acquired from Sarawak. This reflects both the Brooke Rajahs' prioritisation of scientific research in the state, and the influence of Dr Charles Hose, a particularly prolific collector. While the Museum holds objects obtained from multiple well-known figures in Borneo's colonial history, including Ranee Margaret Brooke; Carl Alfred Bock; Ivor H. N. Evans; and, more recently, H. Stephen Morris; more than a third of the entire Borneo collection was acquired through Hose (1863–1929). He was also vendor and donor for thousands of other objects and natural history specimens that now reside in multiple institutions across the UK and beyond.

Hose served Rajah Charles Brooke's government for 23 years at the turn of the 20th century, spending most of his career in the Baram District in northern Sarawak. His collections therefore primarily reflect the cultural diversity of this region. His efforts to assemble an encyclopaedic archive of material culture can be seen in the wide range of objects chosen, from weapons and hunting equipment to textiles and decorative art (including the ba' in Figure 8). Hose was also a keen photographer, and his negatives, amounting to approximately 700 images, were donated to the British Museum after his death.

FIGURE 8: A ba', or baby-carrier, made of wood, rattan, beads and shells (As1904,0416.104). Charles Hose obtained this from a Kenyah community along the Baram River at the turn of the 20th century, and sold it to the British Museum, amongst many other objects, in 1904 (© The Trustees of the British Museum).

Research suggests that Hose's prolific collecting was motivated by three main factors: the demands of administering a remote outstation, which left him heavily reliant on his ability to understand and communicate with the local population; the opportunity to supplement his income by collecting on commission for institutions and private collectors in Europe; and the desire to establish himself as a Borneo scholar on the British academic stage. In the latter he was extremely successful, acting as conduit for much of the knowledge about Borneo that travelled through colonial scientific networks (see Figure 9). These efforts earnt him an honorary doctorate from the University of Cambridge and enabled him to spend his retirement publishing and lecturing widely on Borneo's environment and cultures (Durrans, 1988, 1994; Morris, 2019).

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FIGURE 9: An unidentified man demonstrates a warrior's accoutrements. This is one of many photographs posed by Charles Hose, probably in the grounds of the Brooke government fort at Marudi, Sarawak, to support his interpretation of the material culture he was collecting and disseminating in Europe. The image (NR1930,Hose.B7.1) is among the photographic negatives in the British Museum's Hose collection which have been digitised as part of the 'Interpreting Borneo in Britain' Project (© The Trustees of the British Museum).

As a result of his domination of both scholarly discourse and museum collections, Hose's voice still looms large in interpretations of Borneo worldwide. This is clear in the British Museum's collections documentation, much of which is structured according to an ethnographic classification system devised by Hose. Unfortunately, this has resulted in significant confusion, notably through the persistence of the term 'Klemantan', which Hose coined to describe all the ethnic groups he could not otherwise fit into his classificatory scheme.

The 'Interpreting Borneo in Britain' project has compiled data on ethnographic material acquired through Hose in six museums across the UK, analysing these scattered collections together for the first time. This has enabled us to start addressing the aforementioned issues in the British Museum's documentation. We are also working with stakeholders in Malaysian Borneo and the UK to improve understanding about the objects, and to discuss how this vast archive of material culture might be made more accessible. In November 2024, the British Museum signed a Memorandum of Understanding with the Sarawak Museum Department, facilitating ongoing research collaboration. Workshops in Kuching and Kota Kinabalu in late 2024 also aimed to raise awareness of the material held in UK museums, and to open dialogue about its contemporary significance. The networks formed are exploring how researchers, heritage professionals and grass-roots cultural and heritage organisations might engage with this material going forward.

In June 2025, researchers from the British Museum, Sarawak Museum and documentary filmmakers Borneo Demand Productions visited the Baram River region to continue these discussions with some of the communities from which Hose's collections originally came (Figure 10). Meanwhile, UK-based Sarawak diaspora groups have been invited to visit the British Museum for object-viewing and discussion sessions, and the project has facilitated several research visits from Borneo specialists.

FIGURE 10: Penghulu Lenjau Kulleh and his family examine historical photographs and images of objects from the British Museum collection during a community engagement session at Long Banyok longhouse, on the banks of the Baram River in northern Sarawak, in June 2025 (© The Trustees of the British Museum/Shelly Shirlenna Nadin-Tan)

These community engagement activities have confirmed that there is widespread public interest in interacting with these historic collections, and a need to think creatively about how information about them might be more effectively disseminated. Most of the Museum's Borneo objects are already digitised on the British Museum Collections Online website, but the project has helped clarify how the available media and search terms might be improved to make this database more user-friendly (British Museum Collections Online, https://britishmuseum.org/collection). The newly digitised Hose photographic collection will also be available to browse online by the end of 2025.

This project has not only emphasised the significance of the Borneo collections in the UK, and their potential to contribute to discussions on indigenous identity and heritage, but has also revealed the importance of connecting expertise on Borneo collections globally. Existing difficulties in accessing information may be alleviated by collaboration and information-sharing between both institutions and communities. We hope the network that has facilitated the publication of these papers will continue to build on this important initiative going forward.

ACKNOWLEDGEMENT

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MISSIONARY JOURNEY AND COLLECTING CONTEXT OF THE FRANCKE FOUNDATIONS' BORNEO COLLECTION

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The "Wunderkammer" of the Francke Foundations in Halle combines natural history, missionary heritage, and ethnographic material. A relatively small portion of it originates from the Protestant mission to Borneo in the 1830s and 1840s. This contribution has outlined the historical context of the Borneo mission, the formation of its collection, and its scholarly relevance.

The Francke Foundations actively encouraged their missionaries to send objects home. Director Hermann Agathon Niemeyer emphasized both the promotional value – attracting sponsors through "exotic" artefacts displayed in Halle – and the scientific value of such acquisitions. He wrote to missionary Heinrich Julius Berger in 1838: "You will probably also enclose ordinary items of clothing, weapons of the savages, etc. I would deposit all this in our Cabinet of Natural Curiosities and let the strangers visiting the cabinet be made aware of you and your activities" (AFSt/M 1 G 4 : 38). Natural specimens, weapons, textiles, and everyday objects were requested to enrich the Cabinet of Natural Curiosities. The missionaries in Borneo thus collected within a structured framework aimed at strengthening the mission's reputation and contributing to European scholarship.

FIGURE 11: Cabinet with objects from Borneo in the 'Wunderkammer' (photo: author).

Between 1835 and 1847, only two missionaries from Halle were sent to establish a mission among the Dayak in southern, Dutch-ruled colonial Borneo. Heinrich Julius Berger arrived in Banjarmasin in 1838 and established a station called "Bethabara" among the Ngaju Dayak. It was located between the villages of Sungei Palangkai and Sungai Kangkawang, in the government district of Kabupaten Kapuas in Kalimantan Tengah and about a two days' journey from Banjarmasin. He remained there until his death in 1845, and the provenance of the objects he sent to Halle can therefore mainly be traced back to this area in Pulopetak and occasionally from the regional trading hub of Banjarmasin.

Johann Michael Carl Hupe followed in 1844. His movements were more extensive: he spend some time at Banjarmasin and Bethabara, travelled to Pontianak, and visited several places in its vicinity. In November 1844, he arrived in Sambas, travelled along the Sambas River past several villages and the Sarawak River to Kuching. Now he was no longer in Dutch colonial territory, but in the empire of the "white rajah" James Brooke. From there he went to Singapore, where he resided for over a year before returning to Borneo. At last, in 1846, Hupe attempted to establish a mission in Sarawak between Malay, Chinese and Malabar settlements and trading posts as well as the residence of James Brooke. Today, a signboard at the "Old Courthouse" in Kuching, which is located on the grounds of the missionary house he started to build and now houses a tourism centre, pays tribute to him. When he returned to Europe in 1847, James Brooke took over his house. It was demolished in 1858 and new buildings were built in its place, which were replaced again in the 1870s by Charles Brooke with the Old Courthouse.

The missionary activities of Berger and Hupe thus left their mark not only through the artefacts in the Cabinet of Artefacts and Natural Curiosities in Germany, but also on a smaller scale on Borneo itself.

Archival sources from the Francke Foundations document six shipments of Bornean objects sent between 1839 and 1847. Berger dispatched the first two consignments; Hupe sent four more, including a carefully listed 1845 shipment from Singapore. Many objects entered the Wunderkammer, though duplicates were redistributed to institutions or private recipients. Notably, orangutan remains, geological specimens, and insects reached zoological university institutes.

The extant collection largely comprises everyday objects, including weapons, textiles, baskets, musical instruments, amulets, and ornaments. Archival lists and printed mission reports allow the provenance context of several items to be reconstructed. They include for example:

Musical instruments: Hupe described in a printed report that "Musical instruments play a major role at Dajak festivals and are the same for all tribes, namely the copper gong or kettle drum and an elongated drum, sometimes sixteen feet long, called katambong, of varying thickness." He then sent drums (katambong), and a bamboo- and gourd-based wind instrument.

FIGURE 12: "a composite wind instrument: a hollow cob made from the fruit of a small pumpkin hollowed out by water and ants, in which a bundle of six to seven thin bamboo tubes are inserted like organ pipes", Francke Foundations, reg. no. 485 (photo: Sabrina Mögelin).

Weapons: Shields with faded illustrations, enhanced with rattan (and previously existing human hair which is no longer present), reveal clear signs of prior use. Alongside a dismountable blowpipe, there are darts, quivers and variously shaped spearheads.

FIGURE 13: Shield, sent in 1846, Francke Foundations, reg. no. 613 (photo: Sabrina Mögelin).

However, from which specific pre-owner in which way these objects were acquired or taken so far remains unclear from the archival sources.

The collection at the Francke Foundations is among the earliest European missionary collections from Borneo, predating or paralleling the better-known assemblages of Oscar von Kessel (Dresden, Germany) and Charles Hose (British Museum, London). It reflects the intertwined goals of missionary promotion, scientific inquiry, and European fascination with "curiosities" from colonial contexts. While rooted in 19th-century colonial and missionary agendas, current research on the surviving artefacts focuses on reconstructing the provenance and social significance, supported by archival documentation. The project aims to present findings in a digital exhibition, making both objects and their historical context accessible for further study.

COLLECTED BEFORE 1850 – SOME REMARKS ON THE BORNEO COLLECTION OF OSCAR VON KESSEL

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The Dresden Museum of Ethnology preserves around 650 cultural artifacts from the island of Borneo, which can be traced back to 60 previous owners, including missionaries, colonial officials, and scientists. Although the Borneo collection is not one of the museum's most significant holdings in terms of quantity, it is certainly one of the most significant in terms of age. About one-third of the Borneo artifacts had already found their way into the electoral and royal collections of Dresden decades before the establishment of an independent ethnological museum, which did not take place until 1875. Among the oldest artifacts are a spear, a blowpipe with a spear tip attached, and a quiver with 12 blowpipe arrows (Figure 14), which were recorded in 1687 as weapons belonging to an "Indian king" in the inventory of the "Indian Chamber."

FIGURE 14: Quiver with 12 blowpipe arrows, Dresden Museum of Ethnology, catalogue no. 02873.

It was not until the 19th century that these cultural assets, presumably acquired in the Netherlands, were recognized as evidence from the island of Borneo. This outlines a fundamental problem of early ethnographic collections that poses major challenges for today's curators: reliable information on provenance is rarely available, and imaginative descriptions sometimes conceal a lack of knowledge.

One exception among the early collections is that of the Prussian Oscar Moritz von Kessel (1812–1888), which is remarkably well documented for its time. This proves that the collector had acquired in-depth knowledge of the country. From 1839, O. von Kessel served in the Dutch East Indian colonial army, where he was initially deployed in West Sumatra before being sent on a secret mission to Borneo in 1846. The background to the secret mission was the British-Dutch conflict of interest. After the Sultan of Brunei transferred governmental power over the Sarawak region to the British adventurer James Brooke in 1842, the Dutch feared that he would extend his influence to territories and population groups to which they themselves formally laid claim.

O. von Kessel was tasked with conducting topographical surveys in the border region and covertly investigating Brooke's objectives and the influence he already had on the "Dutch possessions." Between 1846 and 1848, Kessel traveled upstream along the Kapuas River and ventured into the border regions along its tributaries. The exact itineraries of some of his journeys have been preserved in archives. They show that Kessel also documented ethnographic facts.

In 1849, von Kessel was discharged from military service and returned to Europe. He brought with him a collection of 1,200 cultural artifacts, including more than 900 from the island of Borneo. His wish to sell this collection, which he himself called the "East Indian Museum" and exhibited at various locations in Europe, to a museum as a whole remained unfulfilled. Only parts of the collection were acquired by the Royal Art Chamber in Berlin and the Royal Historical Museum in Dresden. The majority of the collection went to the Crystal Palace in London in 1853 and was probably destroyed in the fire of 1936.

Today, the Museum of Ethnology in Dresden still preserves 112 objects from this early Borneo collection. The transcripts of the annotated object lists that O. von Kessel had made available to the purchasers have also been preserved. He preceded these with a general overview of the population of Borneo, which he divided into four groups based on his knowledge at the time, using the then "Wester Afdeeling" of Borneo as a frame of reference rather than the island as a whole: He grouped the inhabitants of Central and North Borneo, the inhabitants of Northwest Borneo, those of East Borneo as "Pari," and those of South Borneo as "Bijadju" according to cultural aspects. The respective cultural artifacts are assigned to these groups and provided with brief, factual explanations and local language terms.

Kessel's lists formed the basis for the inventory at the Ethnographic Museum, which was not completed until 1882 after the collection was taken over from the Historical Museum. The documentalist supplemented the original descriptions by comparing them with the available literature and added his own assessments. These were influenced by the status quo of science at the time. At that time, evolutionism dominated academic discussions with its assumption of a lawful progression from the lower/simple to the higher/more complex. "Savages" or "primitives" were considered representatives of the beginnings of human development, while Europeans believed themselves to be at the highest level of civilization.

The Ethnographic Museum in Dresden used this classification scheme when cataloguing its Borneo collection. The Dayak were characterised as a "very low-level race" in terms of culture, and the description of the individual artefacts also used the common vocabulary of primitivism. There is talk of "raw Dayak originality," "raw aesthetic love of decoration," "wildness," "cruelty," and even "head-chopping rage." The supposed "wildness" and 'cruelty' is illustrated by warrior accessories (Figure 15), trophies, and weapons. Textile products, which the collector Kessel himself had described as "exquisitely beautiful weavings," serve as evidence of "primitiveness." The textiles collected by Kessel are a prime example of the

significance of such early collections for the present-day inhabitants of the regions where Oscar von Kessel once collected.

FIGURE 15: War poncho, Dresden Museum of Ethnology, catalogue no. 01528.

As part of a project to revitalize ikat weaving in Sintang, initiated by the Tropenmuseum in Amsterdam, the Dresden Museum also made a small contribution, providing photographs of textiles from Kessel's collection as inspiration. These were commented on by the weavers in the region. Many were amazed that the patterns of the old ikat textiles from before 1850 were predominantly simple compared to the elaborate patterns of the later well-known ceremonial textiles (pua kumbu). The heyday of ikat weaving was not to come until later. A women's jacket made using the sungkit technique, according to Kessel from the Ketungau region (Figure 16), was said to be unable to have come from there because it seemed unfamiliar to contemporary weavers in the region. The profound cultural change that has taken place over the past 175 years makes historical documentation such as that of Oscar von Kessel an important source for historiography.

FIGURE 16: Women's jacket “Bahdju Katungau”, Dresden Museum of Ethnology, catalogue no. 01628 (photo: Eva Winkler).

RA'ONG KELABIT (KELABIT SUNHAT) BRITISH MUSEUM NUMBER 1988,22.46

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Alena was searching for a Kelabit sunhat. She didn't need a physical sunhat; she just needed an image. She typed the words in Google Ra'ong Kelabit and she was very surprised when the British Museum website came up with the image number 1988,22.46.

FIGURE 17: Kelabit sunhat 1988, 22.46 (Photo copyright: Trustees of the British Museum).

It was a serendipitous moment as she wasn't expecting a museum in the UK to be the source for the image, nor did she expect to be intimately linked to this particular sunhat through kinship. This very sunhat was obtained for the British Museum from her own auntie Sina Rang Bala who lives in the Kelabit village of Batu Patong. This short article celebrates the marvels of digital search engines and the way in which source communities in the highlands of Borneo can become connected across the world through museum objects whose profile have been digitalized online. I will look at this hat, look at how it might have been put together and its history and then I will outline why Alena Murang, a contemporary young Kelabit creative artist wanted the image of this hat.

The Story and the Making of the Sunhat

Sina Rang sold the hat to anthropologist Monica Janowski who was making a collection for the British Museum, for RM30 in 1988. The base of the unornamented hat was originally purchased by Sina Rang from a relative from Long Lellang. I will outline how this was likely to have been made, based on research on other similar hats. This hat is made of leaves of the fan palm daun ilad Licuala valida. Immature unexpanded leaflets are collected and dried flat. When they are needed for the making of the hat, the leaves are opened up and flattened .A needle threaded with cotton is pushed through the middle of a leaf. The other leaves are then placed on the needle, and the needle is pushed through them. The leaves are then all opened out to form a rough circle shape that is held in place by the needle at the centre. The edges of the leaves are pinned together with bamboo pins. Next, strong cotton thread is used to stitch across every leaf rib and each edge. The ends of the leaves are trimmed to form an even brim. A rattan ring is inserted to form the rim and this is stitched carefully to the body of the hat. A loop is attached to the underside of the hat so it can be hung up when not in use. The skull cap that is sewn into the base of the sunhat is woven of a local soft reed (berpah).

This type of basic hat is widely used in rural Sarawak for protection from the sun and the rain. More decorated ornamental versions are used for outdoor cultural gatherings. The hat is also an important symbol in a Kayan and Kenyah wedding ceremony when the bride is covered in layers of protective hats.

Literacy and Beadwork

It was in the late 1960s when school girl Sina Rang Bala wrote the words, "Selamat Pakai from Kelabit Girl" to make the pattern for the beadwork on the hat. Selamat Pakai means happy wearing. Her sister, the school cook, did the threading of the beads on to the hat. The beads were a gift from their headmaster, Manson Toynbee. The pattern, made of abstract designs and words is typical of basketry patterns of the era of the 1960s. The women were keen to weave messages on their baskets that reflected their newly found literacy skills in English, which had been acquired through the new schools that had been set up at this time in the highlands. Moreover, they had a lot of opportunities to practise their spoken English as there were lots of Allied soldiers in the area defending the border from incursions from Indonesia. There is a story in the museum catalogue that the hat was once intended as a gift for a British soldier but that is a story that yet to be fathomed.

Sky Songs and Sunhats : Alena's Album Cover

To return to the story of Alena's search for an image of a sunhat. She wanted the image for the cover of her new album of Kelabit and Kenyah songs, called Sky Songs, which honours the sky. Why the sunhat? This is because she had read that "our ancestors referred to the sky as a big sunhat dome, and all earthly creation lay under it." One song on the album, Gitu'an (stars, in Kelabit) celebrates the stars, the ancestors, and the sky – the lyrics go: "We are our ancestors / We are people of the sky". In a song called We Watched The Clouds, she sings about a migration journey and the clouds swirling in the sky above the Masia mountain range. The last song in the album is Sunhat Song: "say a prayer for all my lovin' ones under this sunhat up in the highlands." The old idea of the sky as a protective dome, like a sunhat is given new currency..

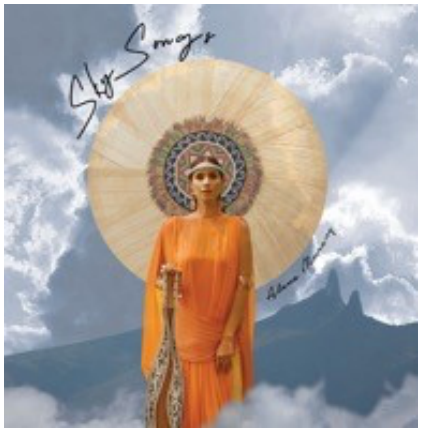

FIGURE 18: Album cover *Sky Songs* (photo: Alena Murang).

FIGURE 19: Inner page from Alena Murang's Sky Songs cover (photo: Alena Murang).

Alena fittingly made this hat a background with her image set against the backdrop of the iconic mountain Batu Lawi for her album cover. Her music and lyrics recall the cosmology and the culture of the Kelabit highland people. The digital image and the story of the Kelabit sunhat in the British Museum has now become disseminated to a generation of ethnic music lovers who have purchased Alena Murang's CD.

SOME UGLY, DISPOSABLE, AND CAGEY ARTEFACTS IN BORNEO COLLECTIONS

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Books on Borneo, whether museum or privately produced volumes on thematic collections, mostly display beautiful photographs made of beautiful objects by professional photographers, hardly ever bad pictures made of ugly artefacts by inept photographers. Artefacts of the latter sort, however, do exist, much more commonly than those of the former, and sometimes manage to sneak into ethnographic collections – albeit rarely into books, whatever the photographer's technical skill or artistic flair.

The anthropology of ugly, ordinary artefacts (or 'mundane objects') may well stand at the cutting edge of the discipline, in the same way that archaeologists now prioritize research on antique garbage dumps (see 'history of waste' or 'archaeology of rubbish'). Indeed, past garbage dumps reflect their owners' lives, cultures, and societies in a more profound, detailed, and manifest way than exquisite elite art forms or arresting monumental architecture. The heuristic value of garbage, a mirror of society, should never be made light of. Garbage speaks volumes about life.

Granted, Borneo's traditional hinterland settlements had no garbage dumps, except for the nearby stream, and refuse chiefly consisted of natural materials (animal bones, plant debris, kitchen waste) that were casually thrown out the door or through holes in the longhouse's plank floor, along with shattered earthenware, ripped baskets, broken wooden tools, ruined clothes, and the occasional bead, shell, or other trinket.

In the late 20th century, when modern garbage disposal was still lacking and rivers had turned into maxima cloaca, the space under the longhouse, no longer the foul muddy mess resulting from pigs' frenetic scavenging, had become a dry storage area, where I picked up, for reference, the odd damaged utensil or torn piece of plaitwork that caught my eye as I passed by.

Ethnographers in the field may find themselves faced with bizarre artefacts of the "what is this (for)?" kind. Their usual situation, however, is one in which they either can witness the object being used or are surrounded by participants in the local culture who can offer clarification (about its name, materials, or function). While people might be surprised to see a passing stranger picking up their refuse, they would not hold back explanations.

Artshops' backrooms and museums' depots, too, are likely to reveal, in their darker, dustier recesses, bizarre objects having not seen the light of day for decades or centuries and calling for help. When inventory numbers and ancient files have disappeared or the attendants are clueless, ethnographers must scan their inner pinacotheca to summon reminiscences of artefacts they may have encountered in the field, in collections, or in publications, in order to come up, by mere morphological analogy, with the 'next of kin' for identification: "It looks a bit like this".

Results may be misleading: When I first looked at Artefact No. 2 (Figure 21), I thought of a sling; then I thought again. Ethnographers also scrutinize the artefact for function: "It might be used for …". Beyond making out a mysterious artefact's use, clarifying its origin is a further challenge. Today, taking a photograph and punching it into some AI program in one's smartphone may be a faster way to do the job, for function and origin.

Of course, not all weird objects are necessarily ugly. My focus here is on truly unpretentious daily-use objects serving basic practical purposes, though not immediately recognizable. Here are some artefacts of low aesthetic value, selected from the narrow register of portable or disposable items of material culture of Borneo's nomadic forest hunter-gatherers.

As is well known, when one has to go on a trek with only a backpack, objects can be perceived as burdensome, and even lightweight ones may be deemed superfluous, especially when they can be procured or manufactured anywhere at any time from locally available materials with only minimal effort – and none spent on ornamentation. Instead of carrying along an 'ordinary' item, neither rare nor precious, when traveling, an instant decision may be to discard it on the spot, to replace it later, whenever needed again. Single-use objects, easy to make, easy to discard.

Such unattractive artefacts, however, are rich in meaning. They tacitly inform, embody, and symbolize these nomadic bands' culture, lifeways, and social fabric, as expressed in their collective food production and consumption, their group migrating, or their joint entertainment.

FIGURE 20: Simple disposable forks, made of a soft wood stick split into four pointed teeth, and used to dip into the cooking pot for a mouthful of hot sticky sago gruel; Penan nomads, upper Baram River, Sarawak (photo: author).

FIGURE 21: Forehead strap, made of soft flattened, dried, and plaited sedge stems and used in addition to shoulder straps to carry a heavy burden basket; the braided cord's extremities are tied to the basket's back piece; Penan, Sarawak (photo: author).

FIGURE 22: Bamboo harp, a musical instrument of nomadic Penan; a single bamboo internode, with four narrow strips cut out of its outer skin and uplifted to serve as the harp's strings (frets replaced); a narrow slit was cut through the bamboo section's length for resonance (photo: author).

FIGURE 23: A tool for sago starch production; a long sturdy wooden handle attached with rattan binding and resin to a scoop-shaped piece of hard palm stipe; the sharp edge scrapes the fibrous marrow out of the sago palm stipe; manufactured on the spot, discarded after use; Punan Tubu, North Kalimantan (photo: N. Césard, MNHN, Paris, Inv. ETB-ID-NC-2015-011).

CONCLUSION

The workshop brought together researchers from various backgrounds and countries, resulting in an exchange on different collection areas relating to cultural objects from Borneo. It became apparent where and in which ways collections were created, and even though research in these area has progressed, provenance research remains a desideratum. Therefore, an essential part of the workshop was to promote networking among researchers who can benefit from advanced exchanges.

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ACADEMIC IMPACT MAGNIFIED (A.I.M.): A Case Study in Cultural Programming Impact

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ABSTRACT

This article introduces Academic Impact Magnified (A.I.M.), a conceptual framework I developed to articulate the productive intersection between scholarly inquiry and cultural programming. Emerging from my interdisciplinary trajectory—from legal practice to curatorial leadership and academic research—A.I.M. asserts that impactful scholarship must extend beyond the bounds of academic publishing to engage diverse publics through intentional and dialogic cultural experiences. Drawing on recent programming at University Malaysia Sarawak (UNIMAS), this paper elucidates the praxis of A.I.M. through curated dialogue, participatory workshops and peer collaboration. I contextualise A.I.M. within my broader curatorial-academic practice, examining case studies such as various exhibition programmes, the cultural marquee, Gallery Weekend Kuala Lumpur (GWKL) and the Museum of Oxford's "Image & Identity" exhibition. I argue that cultural programming is not simply a mechanism for dissemination, but a generative and rigorous site for knowledge production, critical reflection and public impact.

Keywords: Exhibition; Culture; Programming; Soft Power; Academic

OVERVIEW

Trained as a lawyer in the United Kingdom and the United States, I began my career in legal practice with little foresight of one day lecturing on curatorial and analytical methodologies and translating academic theory into public programming. In retrospect, however, the evolution from law to cultural scholarship appears not only coherent but necessary. What has consistently guided my professional journey, (across legal, cultural, and academic domains), is a commitment to meaningful communication, stakeholder engagement, and the construction of inclusive, critical frameworks effected through efficient project management.

This commitment underpins *Academic Impact Magnified* (A.I.M.), a framework that crystallizes my belief in the mobility of scholarship: that intellectual work must move, beyond journals and conference,

into the community realm. When scholarship resonates across audiences, it amplifies its potential for societal contribution.

THE EMERGENCE & EMBODIMENT of 'A.I.M.'

A.I.M. did not originate as a theoretical postulate; it emerged organically through praxis and further to the development of a lecture that I delivered at UNIMAS in April 2025. In 1998, following nearly a decade in law, I pivoted toward cultural programming, driven by a recognition that Southeast Asian arts were often overlooked, undervalued and insufficiently resourced. I saw an opportunity to create platforms that integrated academic rigour with community engagement, creativity and interdisciplinary inquiry.

Over the past three decades, I have curated, convened, and facilitated numerous exhibitions, lectures, and public dialogues. A recurring insight from this work was clear: academic ideas acquire clarity and traction when brought into cultural and participatory contexts. This was not auxiliary to scholarship. It was integral to its practice.

Based on my curatorial practice and longstanding questions relating to viewer interface with early photographs, I developed and published on the analytical concept, 'veins of influence', using as case study early colonial photographs. (Amerasinghe Ganendra, 2023) The argument built around the 'veins of influence' analysis takes a reconstructive approach to contextualize and interpret, in the case of that publication, colonial era photographs of Ceylon. But the concept has much wider application to affect the way we interface with what we see and create. My framework *Veins of Influence* provides a conceptual scaffolding for A.I.M. by appreciating the circularity of and synergies between cultural programming and academic investigation. A.I.M. became the term I coined to encapsulate this approach. It is more than an acronym; it is an ethos, one that privileges intentional design of programming to amplify and deepen the societal reach of scholarly ideas.

A core proposition of A.I.M. is that cultural programming constitutes not simply dissemination but methodology. Exhibitions, lectures, and public events generate feedback loops (affective, discursive, and intellectual), that challenge and refine scholarly assumptions. They demand accessibility without compromising gravitas, relevance without dilution and creativity as a accelerator.

Through A.I.M., I propose that public cultural engagement is a legitimate and necessary mode of research. It fosters humility, encourages innovation, and situates academic knowledge within lived realities.

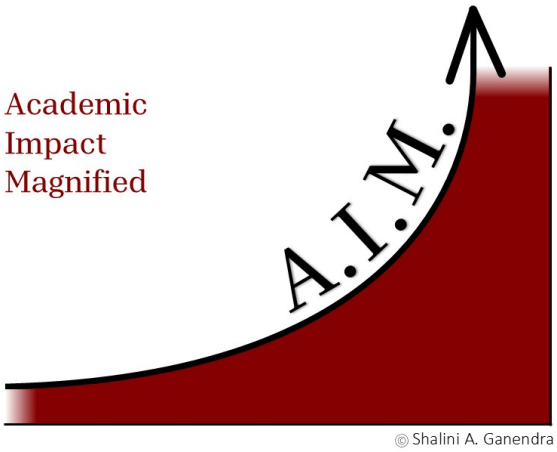

FIGURE 1: UNIMAS Lecture and Workshop: A.I.M. in Practice

Then, in April 2025, I had the privilege of presenting A.I.M. in action at University Malaysia Sarawak (UNIMAS), through an invited lecture and a full-capacity Master Class. My objective was to explore the synthesis between academic research and cultural engagement, and to demonstrate how intellectual narratives can be activated through public programming, including exhibition.

The lecture, held in the university's Institute of Borneo Studies, drew a diverse audience, (academics, students, curators, artists, and administrators). I opened with a provocation: *How can your research make a difference, beyond the thesis, beyond the conference, beyond the footnotes?*

Through case studies and reflections on my interdisciplinary journey, from legal practise on Wall Street and in London to curatorial work in Kuala Lumpur and beyond, I demonstrated A.I.M.'s application. I spoke to curating as a mode of inquiry, programming as dialogic space, and collaboration as a research method. The room responded in kind, with curiosity, questions, and creative momentum. I received feedback from Ph.D. candidates in particular and the Institute Director that the concept of A.I.M. opened thoughtful possibilities for the extension of their own research.

The following workshop, *IDEA to EXHIBITION: Curating Narratives, Objects, and Spaces*, offered hands-on engagement with the A.I.M. framework. Participants identified core research themes and translated them into conceptual exhibition proposals. From reimagining Borneo textiles through gendered and postcolonial lenses to developing soundscapes drawn from oral histories, the workshop illustrated the capacity of cultural programming to extend and enrich scholarly investigation. International curators joined via Zoom, further emphasizing the global relevance and adaptability of A.I.M.

FROM PRAXIS TO THEORY AND BACK: CASE STUDIES OF A.I.M.

My formulation of *A.I.M. (Academic Impact Magnified)* is rooted not only in theoretical exploration but in nearly three decades of robust practice, curating, programming, and conceptualizing over 100 exhibitions and public events across Southeast Asia and internationally. This experiential depth has been critical in shaping my understanding of how cultural programming can serve not merely as an outreach mechanism, but as a *methodological tool,* a way to generate, refine, and communicate scholarly insight.

Though most quality exhibition necessarily involve deep research and present varied degrees of scholarly writing to synthesize new understandings, explanations and developments with existing knowledge, I have yet to find academic writing that analyse or advocate the extension of academic research through exhibition, beyond the realms of art history or curatorial studies (for which exhibition practise is central). Furthermore, given the absence of the broad avocation of exhibition to advance the impact the of academic work, there is unsurprisingly also no data measuring the impact, where it has happened, on the nexus between research and exhibition and cultural programming per se. My approach and review here attempt to start a broader conversation, through the mnemonic and acronym, A.I.M., and its case study through my projects and experience.

THE EXHIBITION AS A LABORATORY

Beginning in 1998, I shifted focus from legal work to the arts, founding Shalini Ganendra Fine Art (now Advisory), in Malaysia, a platform that challenged existing paradigms of exhibition creation and arts engagement in the region by expanding the private gallery to be an accessible public space. The gallery evolved into a unique hybrid space that housed exhibitions, dialogues, and residencies, all designed with a deliberate emphasis on accessibility, education, and interdisciplinary exploration.

From 1998, I curated or co-curated over 100 programs including on: contemporary Asian creative narratives; dialogues with architecture; transcultural and cross-cultural practises; textile and other craft traditions; mixed media art practises (such as sound and light art); and others. Each of these exhibitions engaged with academic undercurrents. Through accompanying talks, catalogues, workshops, and artist residencies, the exhibitions became extended platforms for public learning and interdisciplinary reflection.

Exhibition infrastructure was economic and simple, highlighting the connections between curatorial narratives and learning with the objects on display. Walls stayed white, lighting was adjustable and the flexible hanging apparatus enabled visual variation and simplicity. The objects have always been the center of focus, to relate narratives of identity, engagement, representation and so on. (Chisholm & Hollis, 2022)

FIGURE 2: Gallery Residence – Paintings by Elcho Island (Australia) artists (in background), natural pigments and acrylic on canvas; 'Seeds' ceramic chandelier by Lileng Wong; 'Twins' by Zac Lee

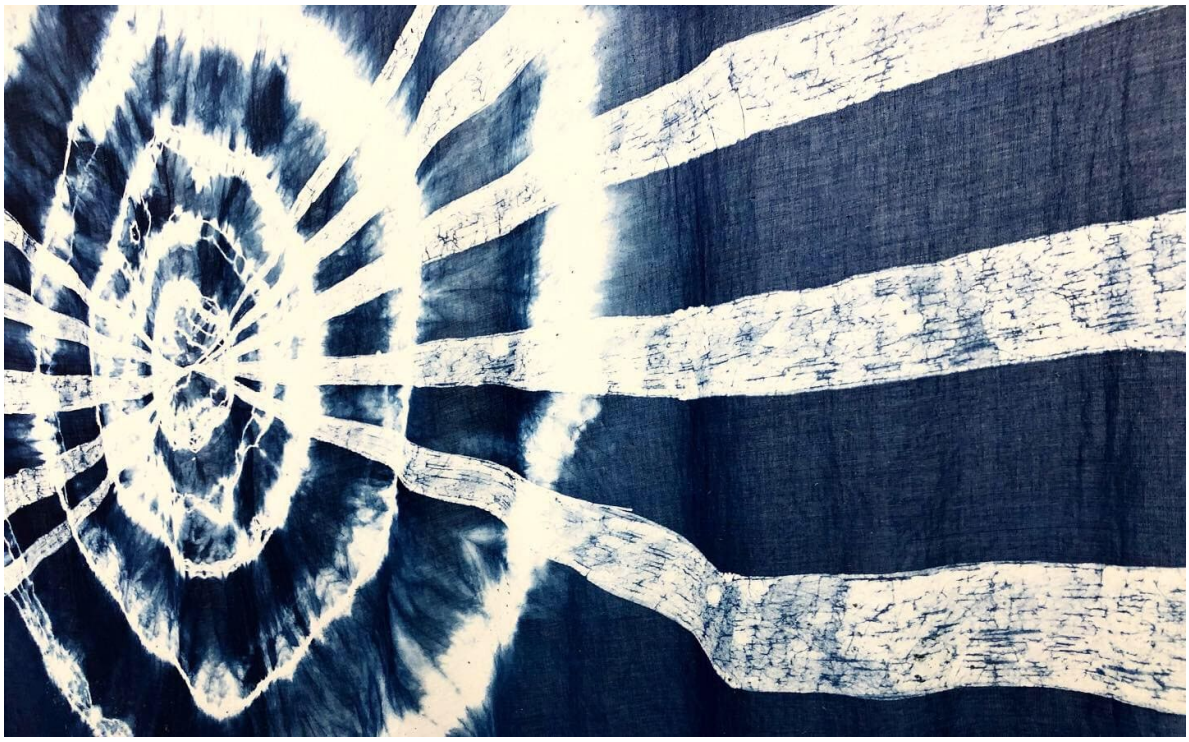

FIGURE 3: Material Matters Exhibition @ SGA, Indigo Textil by Ummi Junid

a) The Gallery Residence: A Site of Innovation

Perhaps the most concentrated manifestation of this curatorial philosophy was the Gallery Residence, a purpose-built site that merged residential, exhibition, and project space in one architectural form, that was a first generation Green Building (2011). The design, innovative and sustainable, was recognized internationally, including receiving two nominations for the Aga Khan Award for Architecture.

FIGURE 4: Gallery Residence, Petaling Jaya, Selangor

What made the Gallery Residence unique was its transformative nature, through placemaking modules located throughout the city (Amerasinghe Ganendra, 2025). The physical space morphed with each exhibition and programme. Importantly, the venues itself became an object of academic and design interest. It served as the platform for numerous cross-disciplinary programs including: Vision Culture Lectures: Hosting scholars, architects, and cultural thinkers (endorsed by the UNESCO Observatory), (Ganendra, 2016); PavilionNOW: A site-specific architecture program encouraging experimentation with local materials.

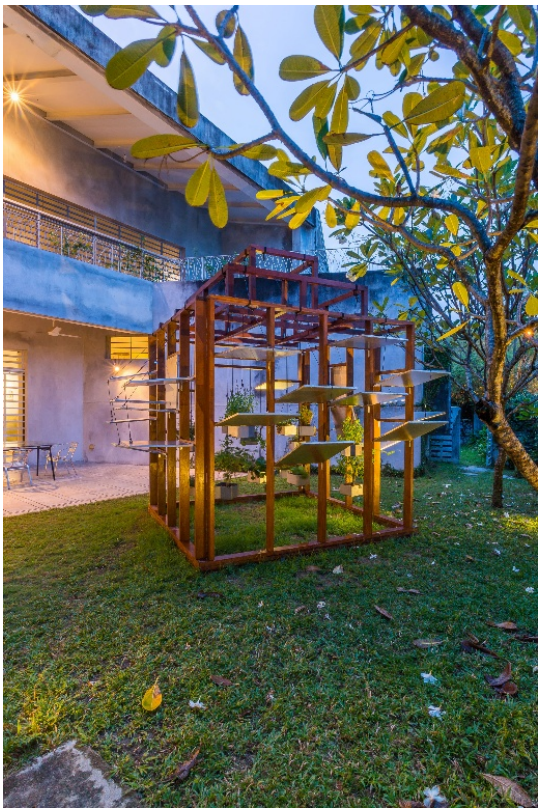

FIGURE 5: Shadow Garden Pavilion, Ar. Eleena Jamil, PavilionNOW SGFA, Gallery Residence

Over the years, I have worked with a diverse range of international institutions and governments, facilitating collaborative projects, including with: foundations and cultural organisations; numerous embassies; local and international museums; and academic institutions. These engagements allowed me to curate cross-cultural dialogues, support artist mobility, and connect regional narratives to global conversations. They also, critically, brought luminary thinkers and creators into Malaysian spaces, thereby localising global thought and globalising local narratives. They were also not mere cultural exchanges but intentional interventions, shaped by curatorial research, critical engagement, and scholarly inquiry – informed by the years of cultural practise.

While my early exhibitions focused on platforming under-represented artists and practices, over time, my programming evolved to also deliberately engage with scholarly constructs and research-led narratives. The iterative process of delivery and review, layered programmes to suit different interest groups as well as attracting broad appeal to build interest. Creative projects increasingly became sites of: archival development; contemporary critique; sustainability dialogues; and interdisciplinary explorations.

Accompanying catalogues and publications, (which were later mostly in digital format to promote the green agenda), extended the life and reach of each program. Some of these publications have now entered libraries (such as the Library of Congress, USA and Asian Art Archives, HK) and form part of digital archives, contributing to the scholarship in the covered subjects (*Shalini Ganendra Advisory Archives*, n.d.).

b) Gallery Weekend Kuala Lumpur (GWKL)

A.I.M.'s principles reflect in Gallery Weekend Kuala Lumpur (GWKL), an annual cultural marquee, which I founded in 2016 and ran for six years. Conceived during an engagement with Malaysia's Ministry of Tourism, GWKL developed as an independent initiative, sustained through partnerships with global and local museums, local galleries, embassies, and cultural practitioners. Over six annual editions, GWKL convened over 25 international thought leaders, many of whom self-funded their participation (Amerasinghe Ganendra, 2021).

GWKL was not merely an art event. It functioned as a living laboratory, a space where pedagogy met practice. My chapter in *Serendipity in a South East Asian Cultural Encounter* (Routledge) reflects on this project as a model for interdisciplinary, impact-driven engagement (Amerasinghe Ganendra, 2025).

Luminary feedback showed appreciation of connectivity as well as cross-cultural learnings. Take for example the comment by Lindy Joubert, (Vice President, World Craft Council, Pacific Asia), who featured in the 2018 Luminary programme: *"I was thrilled to be in the midst of a dynamic group hailing from Kuala Lumpur, New York, Toronto, Singapore and Hong Kong. The dialogue was brilliant - stimulating and informative. GWKL goes from strength to strength, providing innovative programs while embracing collegial and inspiring inter-disciplinary groups of people who come together as one mind, to promote the arts and KL as a world class city of creativity."*

FIGURE 6: Gallery Weekend Kuala Lumpur 2016, Tour of National Art Gallery of Malaysia

c) "Image & Identity" at the Museum of Oxford, Oxford, UK

The 2022 exhibition *Image & Identity* at the Museum of Oxford provided another rich site for A.I.M. application. Invited to curate this project, I employed my research framework *Veins of Influence* (Amerasinghe Ganendra, 2023), which examines colonial-era photography through the lenses of institutional and personal biography, image agency, and display ethics.

This exhibition juxtaposed archival materials from Oxfordshire and Sri Lanka with new works by contemporary Sri Lankan artist Sujeewa Kumari. This curatorial approach foregrounded the entanglements of history, identity, and visual culture, inviting audiences to consider similarities and differences in the various communities photographed, touching on colonial legacies in image-making and perception.

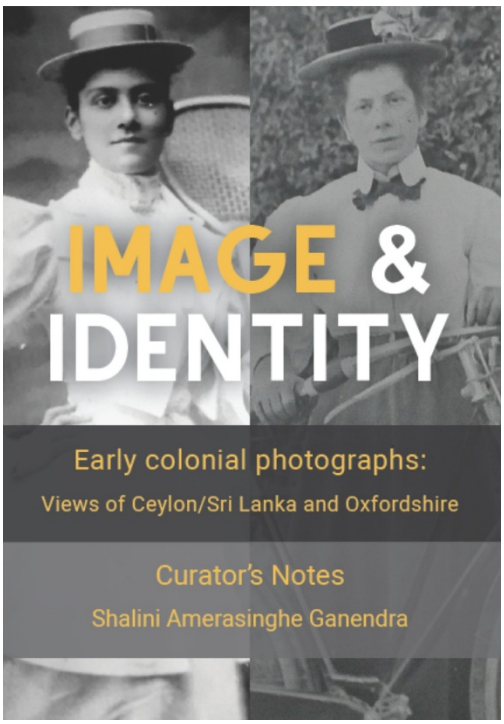

FIGURE 7: Image & Identity Catalogue cover, Museum of Oxford, Oxford, UK, 2021

More than a static display, *Image & Identity* became a dynamic discursive platform, hosting public talks, school workshops, and guided dialogues. The programme made visible the ways in which curatorial practice can serve as both research method and pedagogical tool, to provide deeper understanding of the content and the communities represented and engaged with (Viv Golding & Wayne Modest, 2013).

FIGURE 8: One display from Image & Identity, Museum of Oxford, Oxford, UK, 2021

CONCLUSION

To *aim* is to direct one's focus. To A.I.M. is to direct scholarly focus toward magnification—for impact, inclusivity, and transformation.

The experience at UNIMAS affirmed a shared urgency: to render research meaningful beyond traditional academic circuits. The enthusiasm, interdisciplinarity, and imagination of participants underscored the potential of A.I.M. as a framework for engaged and generative scholarship.

Academic Impact Magnified is not a static formula. It is a living, evolving framework that responds to context, dialogue, and collaboration. I invite scholars, curators, and cultural practitioners to consider: How might your scholarship resonate beyond the academy? What forms might it take? Whom might it reach?

These questions lie at the heart of A.I.M., and of a scholarship committed to extending its impact to real-world relevance.

ACKNOWLEDGEMENTS

I thank all the curious and dynamic participants in the nearly three decades of cultural programmes, which have delivered impact far beyond what was initially anticipated, with the ripple effects continuing today. These creative luminaries informed my own A.I.M. journey which I now share here. Thank you also to UNIMAS, Institute of Borneo Studies, for giving me the opportunity to speak on these experiences and evolve the concept of A.I.M. My hope is that the dynamic of A.I.M. continues to inform academic practise for richer and deeper understanding foregrounding curiosity and investment in human creative endeavour.

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