

Weaving Change: Enhancing Economic Empowerment Among Penan Weavers

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Note: Authors are listed alphabetically with the faculty mentors listed last.

Cover photo: Penan weaver weaving intricate designs in Long Lilim Village, Sarawak, Malaysia (photo by Chloe Tan)



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By adopting an ethnographic approach to our research and using our personal experiences as key data sets, we recognize that our inherently subjective findings may not comprehensively and accurately reflect the true experiences of the Penan. While efforts have been made to reduce this subjectivity, we nevertheless acknowledge the inherent biases we bring, and concerns of positionality over our research method.

Our interview protocol was approved by the Singapore Management University Institutional Review Board [Approval Number: IRB-25-192-A155(925)].



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Penan villager finding a wild rattan palm in the Sarawakian forest (photo by Chriscavin Wijaya)

Contents

Executive Summary.....1

Enduring Penan Traditions and the Market..... 2

Geographical, Economic, and Cultural Issues of Reach..... 5

About Our Research: Some Vignettes..... 5

Data Analysis: What We Found..... 9

Interviews as Research.....10

What We Heard: Social Enterprises Don’t Reach Everyone..... 12

Lessons Learned.....13





Figure 1. Penan weaver washing dyed black rattan with water in Long Lilim Village, Sarawak, Malaysia

Executive Summary

On a narrow wooden terrace overlooking the Sarawakian jungle, Penan women weave rattan into intricate bags and mats, their fingers tracing geometric patterns passed down for generations. Each piece embodies cultural heritage and economic hope, but the weavers' geographical distance from the market limits the income they make from this work. Partnering with Helping Hands Penan (HHP), a volunteer-run social enterprise that connects weavers with consumers, we examined how social enterprises can transform traditional artistry into sustained livelihoods for rural Indigenous communities.

HHP purchases woven products directly from the weavers and sells them in urban markets, reinvesting profits into household needs, logistics, and education. Despite more than a decade of operation,

challenges remain. Larger brands dominate consumer preferences, the nonprofit's organizational capacity is limited by volunteer shortages, and oversupply across villages intensifies competition. Meanwhile, weak social networks, language barriers, and domestic responsibilities further marginalize unaffiliated weavers.

To explore these dynamics, our team conducted ethnographic fieldwork in Long Lilim village, documenting rattan harvesting, processing, and weaving practices, and interviewing six weavers. By comparing the experiences of HHP-affiliated and -unaffiliated weavers, we found that the two groups' income differences are not rooted in lack of skill but in broader structural inequalities. We found that HHP's limited purchasing capacity and reliance on familiar networks has the unintended effect of leaving HHP-unaffiliated weavers with reduced access to stable markets, income streams, and educational sponsorships. These challenges persist despite the organization's broad commitment to inclusion and community development. These findings extend beyond HHP and out to the wider social enterprise landscape, where social enterprises tend to fall short of their intended objectives and reproduce inequality within their beneficiary communities.

We reconceptualize "hardest to reach" as a matter of distributional justice, and recommend that social enterprises like HHP adopt justice-oriented inclusion strategies that reframe outreach to unaffiliated craftspeople as a structural correction. Key actions include redistributive quotas, relational communication through trusted intermediaries, culturally grounded engagement, and capacity building in volunteer pipelines and skills workshops. Sustainable income generation requires moving beyond access alone toward strategies that embed justice, strengthen intervillage collaboration, and empower rural Indigenous craftspeople as equal contributors to both cultural preservation and economic development. Social enterprises with a focus on heritage crafts thrive when they combine redistributive mechanisms, organizational capacity building, and culturally grounded communication, ensuring that their impact translates into sustainable livelihoods for Indigenous communities.

Enduring Penan Traditions and the Market

Terima Kasih. Jian Kenin. Both phrases mean “thank you” in Malaysian Borneo. One is spoken by the mainstream Malay population, the other by one of the hardest-to-reach Indigenous populations in Malaysia.

The Penan are Indigenous, nomadic hunter-gatherers who reside primarily in the rainforests of Sarawak, Malaysia. With an estimated population between 10,000 and 12,000, they depend on the rainforest for food, water, and medicinal plants.¹ But the rainforest is far more than an economic resource. They regard it as a living presence that shapes identity, spirituality, and collective memory. Their cosmology and oral traditions embed the forest as a sacred place of guidance and continuity. This world view underpins their ethic of restraint: they live in harmony with nature, mindful to take only what is needed, guided by a deep sense of reciprocity and respect for the forest as both provider and ancestor.² In this way, the Penans’ relationship with the rainforest reflects not only practical reliance but also a profound psychological and spiritual bond that sustains community life and cultural heritage.

Many Indigenous traditions endure despite modernization, external pressures, and other challenges. For the Penan people, one important tradition is their practice of weaving. Our team, in collaboration with volunteers from Helping Hands Penan (HHP), travelled seven hours by car from Miri, the second largest city in Sarawak, to the 70-household Penan village of Long Lilim to meet some of these artisans. We aimed to explore how

social enterprises can transform weavers’ intricate handicrafts into sustained livelihoods by connecting artisans with markets in Miri and elsewhere. In doing so, we aimed to advance knowledge regarding scaling social enterprises for Indigenous community impact and empowerment. Such scaling can uplift not only the Penan community, but also other marginalized Indigenous communities in achieving greater financial stability and self-sufficiency.

| Helping Hands Penan

HHP is a volunteer-run, nonprofit social enterprise that supports the Penan community in becoming more self-sufficient. Its work focuses primarily on Penan women, building on their long-standing weaving traditions to generate income. Social enterprises like HHP are part of a “fourth sector” of organizations that blend the strengths of public, private, and nonprofit models to achieve social goals through business practices.³ HHP’s work and the challenges that the Penan face are entwined with the UN Sustainable Development Goals. For example, the integral role of women in the organization’s operating model — from female-led leadership, volunteers, and the women artisans themselves often being the significant source of income for their families — exemplifies how gender equality (SDG 5) is echoed across this collaboration.

Hybrid social business models are particularly effective in remote communities such as those of the Penan. Social businesses like HHP seek to erode middleman involvement in the sales of handicrafts which could otherwise mean unfair price distributions for the sellers. These models combine direct sales with reinvestment into education, logistics, or healthcare, ensuring that immediate income is paired with long-term benefits for the communities.⁴ In practice, profits are not distributed to shareholders but reinvested to strengthen local capacity and resilience, such as through educational sponsorships. These sponsorships aid

1 “The Penan,” Survival International, 2023. [🔗](#)

2 Wade Davis, “The Penan: Community in the Rainforest,” *In Context: A Quarterly of Humane Sustainable Culture*, 29 (1991). [🔗](#)

3 Ruth Avidar, “Public Relations and Social Businesses: The Importance of Enhancing Engagement,” *Public Relations Review* 43, no. 5 (2017): 955–62.

4 Nancy M.P. Bocken, Alison Fil, and Jaideep Prabhu, “Scaling Up Social Businesses in Developing Markets,” *Journal of Cleaner Production* 139 (December 2016): 295–308.

in overcoming income-related barriers by enabling the Penan children to travel to the nearest towns, secure residential arrangements, and access quality education (SDG 4). Historically, the difficult terrain has excluded the Penan tribes from developments in the outside world, compounded by linguistic and cultural barriers. Such isolation has not left them in abject poverty, since their subsistence needs are met through the rainforest, but it has entrenched relative poverty, limiting their share of socioeconomic development otherwise accessible in the urban spheres. Their development therefore not only increases incomes but also reduces inequality gaps (SDG 10), providing more equitable thresholds in terms of quality of life, social development, and sustainable livelihoods.

Social enterprises succeed when they act as intermediaries between local producers and external markets, while also protecting cultural identity. This delicate balance between economic empowerment and cultural sustainability ensures that income generation reinforces, rather than erodes, tradition.⁵

For HHP, bridging the distance means more than moving products; it means creating pathways of opportunity across both geography, economy, and culture. The Penan women's exceptional weaving skills exemplify how cultural heritage can be linked to economic empowerment. Their craft — bags, pouches, and mats woven from locally sourced rattan — has been passed down for generations, embodying both knowledge and identity. By recognizing Indigenous knowledge as expertise and addressing structural barriers to inclusion, HHP facilitates the preservation of Penan cultural heritage while serving as a custodian of its translation into equitable livelihoods. Over the past decade, HHP has worked alongside the community to purchase woven products directly from weavers, transport them across difficult terrain to urban markets, and sell them at boutique fairs. In doing so, HHP bridges the physical distance between remote villages and urban consumers, the economic distance between subsistence livelihoods (gathering or producing resources for direct consumption) and market participation, and the cultural divide between

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Indigenous traditions and modern economies. Profits support household needs, logistics, and education, while additional funding sustains longer-term initiatives such as educational sponsorships and allowances for Penan students. These efforts reflect HHP's dual commitment to meeting immediate needs while investing in the future. This cycle illustrates how social enterprises can connect traditional practices to modern markets while reinvesting benefits back into the community.

Other organizations, such as the Penan Women Project, share similar aims but face distinct challenges. Founded by the Miri Women Weaving Association, the project primarily uses polypropylene strips rather than rattan. This shift responds to the scarcity of rattan caused by commercial logging and its long maturation cycle. Polypropylene offers durability, lower cost, and colour variety attractive to consumers. However, this substitution risks diluting the cultural heritage embedded in rattan harvesting and processing —

⁵ Pannapa Khiawnoi, Sor Sirichai Nakudom, Pinrudee Noobutr, and Uthorn Kaewzang, "Empowering Communities: The Strategic Role of Community Enterprise Entrepreneurs in Sustainable Development," *Sustainability* 17, no. 12 (2025): 5483.



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In a society driven by individual choice, consumers who intend to do good tend to support charities when the brand matches their own values and identity. This puts small social enterprises at a disadvantage since consumers usually choose bigger, well-known brands that project ethical or aspirational images.

Indigenous practices that have defined the Penan identity for generations. Despite adaptation, sales have declined, underscoring the difficulty of sustaining traditional crafts in competitive markets.

Both HHP and the Penan Women Project confront declining demand for Indigenous handicrafts. In a society driven by individual choice, consumers who intend to do good tend to support charities when the brand matches their own values and identity.⁶ This puts small social enterprises at a disadvantage since consumers usually choose bigger, well-known brands that project ethical or aspirational images. As a result, heritage crafts are overlooked, with sales mostly limited to festive occasions. This weak market threatens the sustainability of initiatives designed to empower the Penan, who continue to earn their livelihoods through weaving. Without stronger income streams, the risk of marginalization deepens, further limiting their access to resources like enhanced education, medicine and amenities.

Hence, it is a multifaceted problem that fails to reduce poverty (SDG 1) and limits future economic growth (SDG 9).

This reality frames our research question: How can social enterprises facilitate sustained income generation for rural Indigenous weavers through the sale of traditional handicrafts? Our study seeks to uncover strategies that organizations like HHP can adopt to strengthen sales while preserving cultural heritage. In doing so, we aim to advance Indigenous empowerment and contribute to the five UN Sustainable Development Goals: No Poverty (SDG 1), Quality Education (SDG 4), Gender Equality (SDG 5), Decent Work and Economic Growth (SDG 9), and Reduced Inequalities (SDG 10). Collectively, these goals provide a framework for analyzing how social enterprises like HHP can link cultural heritage to sustainable livelihoods, thereby reducing inequality and expanding opportunities for Indigenous women weavers.

⁶ Elizabeth Crisp Crawford and Jeremy Jay Jackson, "Reflections on Brand Image: The Influence of Donor Ideal and Perceived Charity Brand Congruence on Charitable Giving," *Frontiers in Communication* 10 (November 2025). [↗](#)

Geographical, Economic, and Cultural Issues of Reach

There are three mutually reinforcing dimensions to the Penan's exclusion: geographical, economic and cultural, particularly linguistic. First, the Penan face geographical exclusion due to their remote living conditions. An increasing number of Penan, who were originally nomadic, have recently settled in remote rainforest villages, often accessible only by rutted dirt roads. Climate change and the loss of Indigenous land to logging have resulted in diminished access to animals, plants, medicinal plants, and raw materials. These environmental losses are compounded by soil erosion that pollutes rivers and makes the water unsafe for consumption. In many ways, their traditional lifestyle has been disrupted, gradually shifting them from isolated, self-sufficient hunter-gather societies toward participation in the capitalistic economy.⁷ This transition, combined with pressures from commercialization, has contributed to high relative poverty. While some community members adapt more readily than others to new economic realities, most get left behind.⁸

Second, geographical isolation limits access to economic goods and activities. With the geographical isolation of the Penan villages, there is limited transport of essential commodities and medical assistance from urban centres. Isolation also makes it difficult for villagers to commute to the city centre for these same services. The lack of transportation in the form of skilled drivers to drive

the Penan weavers to the city centre also limits the level of income they are able to gain from the sale of their handicrafts.

Third, cultural, and particularly linguistic, challenges add another dimension to this problem. Conversations with HPP's director, Violette Tan, revealed that many women feel a strong sense of attachment to their children, and are reluctant to travel to city centres because of the prolonged time away from their children. They also face language barriers with the wider Sarawakian population — most Penan did not receive formal education beyond primary school, and are unable to read and speak in Malay since they primarily communicate in their own language. These challenges restrict the weavers' capacity and willingness to seek access to urban markets, healthcare, and other amenities.

About Our Research: Some Vignettes

We use an ethnographic approach to our immersive community-based research to understand the lived experiences of the Penan.⁹ This approach offered us textured, situated accounts of Indigenous community processes, helping us to learn about local perspectives, needs, and context, and revealing dynamics beyond our secondary research. Our experiences, as part of our ethnographic approach, served as key data in framing our interpretations of the challenges faced by the Penan, and played a part in shaping the recommendations provided in the later sections.

7 Joern Birkmann, Emma Liwenga, Rajiv Pandey, et al., "Poverty, Livelihoods and Sustainable Development," in *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by the Intergovernmental Panel on Climate Change (IPCC), 1171–1284 (Cambridge: Cambridge University Press, 2022).

8 Anita Harper, Stuart Hill, Myrle Ballard, and Shirley Thompson, "Shifting from Economic Poverty to Prosperity: The Challenge for Indigenous Communities," *Canadian Journal of Nonprofit and Social Economy Research* 14, no. S1 (2023). [↗](#)

9 Caroline E. Schuster, Enrique Bernardou, and David Bueni, "Appendix D: Anthropological Methods for Forecasts," in *Forecasts: A Story of Weather and Finance at the Edge of Disaster* (Toronto: University of Toronto Press, 2023), 161–74.

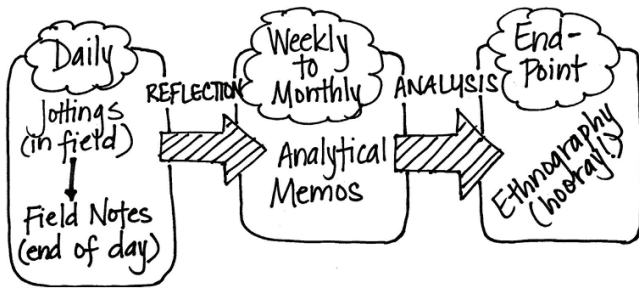


Figure 2. The ethnographic writing cycle¹⁰

We followed the ethnographic writing cycle to gather insights from participant observations and lived experiences in Long Lilim Village.¹¹ In the village, we made running description notes or jottings.¹² At the end of our fieldwork, we reviewed our jottings and refined them into analytical memos that highlight notable moments. Through group reflection, we added our commentaries to the descriptive writing and inserted forgotten episodes to enhance the methodological richness of the vignettes.

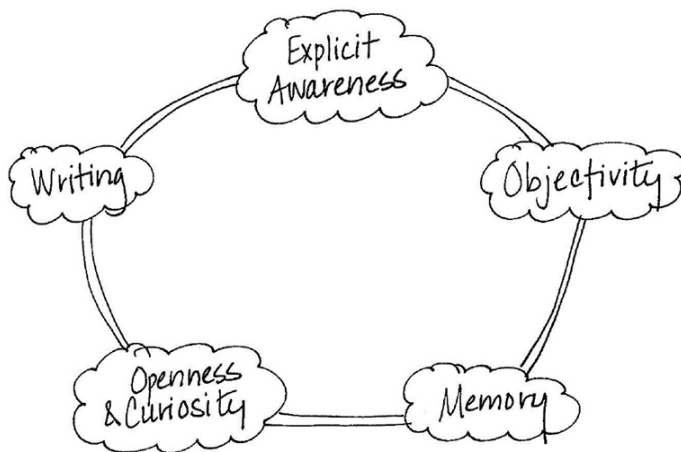


Figure 3. Skills for participant observation¹³

These practices mirror foundational ethnographic skills used in participant observation:

- explicit awareness to remain mindful of surroundings and responses;

- openness and curiosity to build rapport across cultural boundaries;
- memory and writing to preserve fleeting interactions in detailed field notes; and
- objectivity to acknowledge biases while maintaining descriptive integrity.

Sensory attunement and attention to embodied, lived experiences further grounded our documentation, ensuring that the ethnography captured not only observable events but also the affective and corporeal dimensions of daily life in Long Lilim.¹⁴ Together, these interwoven skills strengthened the analytical depth of our reflections, and enhanced the persuasiveness of the ethnographic narrative. We present our findings via vignettes of everyday life in the Penan village of Long Lilim and their interactions with Helping Hands Penan's personnel and operations.¹⁵

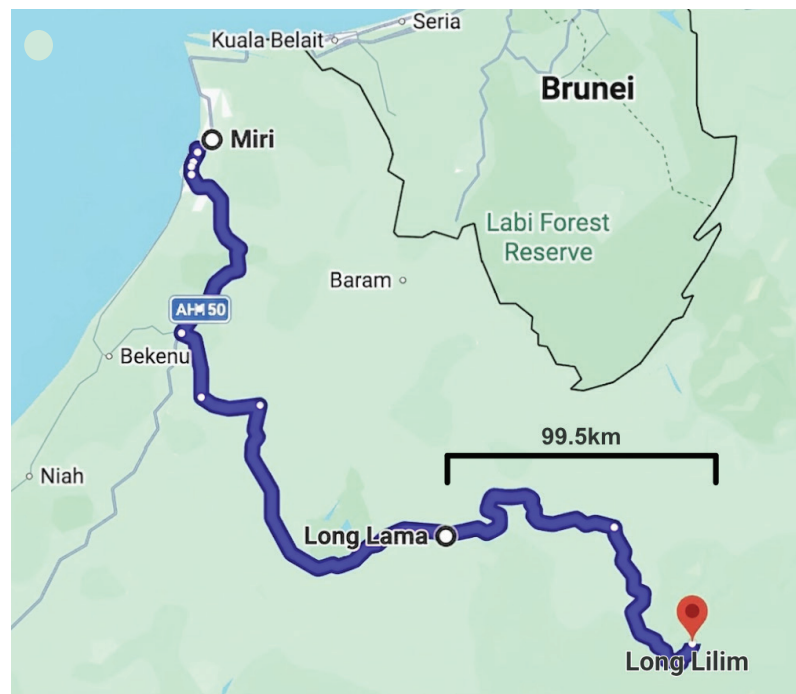


Figure 4. The route from Long Lama town to Long Lilim village, a distance of just under 100 kilometres

¹⁰ Kimberly Kirner and Jan Mills, *Introduction to Ethnographic Research: A Guide for Anthropology* (Los Angeles: Sage, 2020).

¹¹ Ibid.

¹² Nisarata Sangasubana, "How to Conduct Ethnographic Research," *The Qualitative Report* 16, no. 2 (2011): 567–73.

¹³ Kirner and Mills, *Introduction to Ethnographic Research*.

¹⁴ Jessica O'Reilly, "Sensing the Ice," in *The Technocratic Antarctic: An Ethnography of Scientific Expertise and Environmental Governance* (Ithaca: Cornell University Press, 2017), 63–83.

¹⁵ Schuster et al., "Forecasts," 64–79.



Figure 5. (A) Four-wheel-drive pickup; (B) navigating steep, rutted logging trails that are prone to flooding; (C) crossing a wooden bridge with patchwork repairs

Travel to Long Lilim Village

Our journey to Long Lilim started off from the Miri city centre, travelling in an all-wheel-drive pickup for three hours to Long Lama Village on paved roads. Beyond Long Lama, we traversed 100 kilometres of logging trails, crossing wooden bridges with patchwork repairs. A local Penan driver guided us through the rough terrain, navigating steep inclines and uneven paths, drawing on his knowledge to keep us on course for the four-hour trip. Conversations with the driver revealed that the unpaved dirt path is prone to landslides and flooding during the monsoon season, often cutting off access to Long Lama entirely, and leaving villages like Long Lilim disconnected from nearby villages for weeks.

Life in the Long Lilim Village

We arrived at the village during a tropical thunderstorm. Both sides of the narrow road were lined with single-storey houses made from basic structural materials. Our driver braved the rain to unleash the tarps protecting our belongings, passing our bags to villagers who brought them indoors. When other members of the community realized how much work was required, they mobilized into a chain of hands, passing along bags. Of course, we joined the communal work too. This was our introduction to the Penan.

On our second day, we came across two weavers weaving rattan. They sat on the narrow, wooden terrace overlooking the lush jungle, surrounded by

woven bags, baskets, and mats made from local rattan, each displaying the weavers' distinct design. They had been there since sunrise, brows furrowed in concentration, constructing intricate geometric designs. We marvelled at how their nimble fingers manipulated the rattan. One weaver had just completed a piece and used a ruler to measure it as a quality check.

Helping Hands Penan (HHP) volunteers served as our key touchpoints and translators to coordinate the activities that we would participate in, and bring us together with the Long Lilim community. One of the activities they helped to facilitate was the local village fair specially organized for us where the weavers showcased their woven crafts, such as bags, hats, and floor mats of varying sizes and designs. We explored the different crafts available, and purchased items directly from the weavers. HHP also bulk purchased bags from affiliated and unaffiliated weavers to be sold at their upcoming fairs. The Penan weavers' skill level was remarkable across the board, and HHP-affiliated weavers' crafts were indistinguishable from those of unaffiliated weavers.

Some Penan community members showcased their traditional dances for us, with the entire Long Lilim community invited to watch. During the performance, we noticed the headman sitting with community members on the mat along the crowded corridors. The Penan individuals who were watching were also very supportive of those performing, looking at them with respect and fondness, and even videoing the performance with their mobile devices.

Rattan Harvesting, Processing, and Weaving

During our fieldwork, we observed the full cycle of production: Penan men harvesting mature rattan stems from the rainforest, and women transforming them into intricate, functional handicrafts. At dawn of the third day, we joined the Penan men who set out on motorboats, navigating the Long River toward where wild rattan grows. Guided by generations of Indigenous knowledge, they know which bends in the river and which forest patches yield the strongest rattan. They hiked swiftly through dense foliage, pausing only when they located rattan palms. The men stripped away the leaves, measured the stem

by hand, and cut them to size with a knife. They bundled the stems securely and carried them in woven baskets. They also fished and foraged before returning to Long Lilim village at dusk.

The next day Penan women then continued the process in the village, expertly applying traditional techniques. First, they scrubbed the rattan clean of any remaining residue and shaved the stems into uniform strips. Using traditional plant-based recipes to achieve a deep black dye, they boiled the strips of rattan to stain them, then rinsed them, and left them to dry in the sun for the rest of the day. To maximize the time we had in Long Lilim, the women had pre-prepared another batch of processed

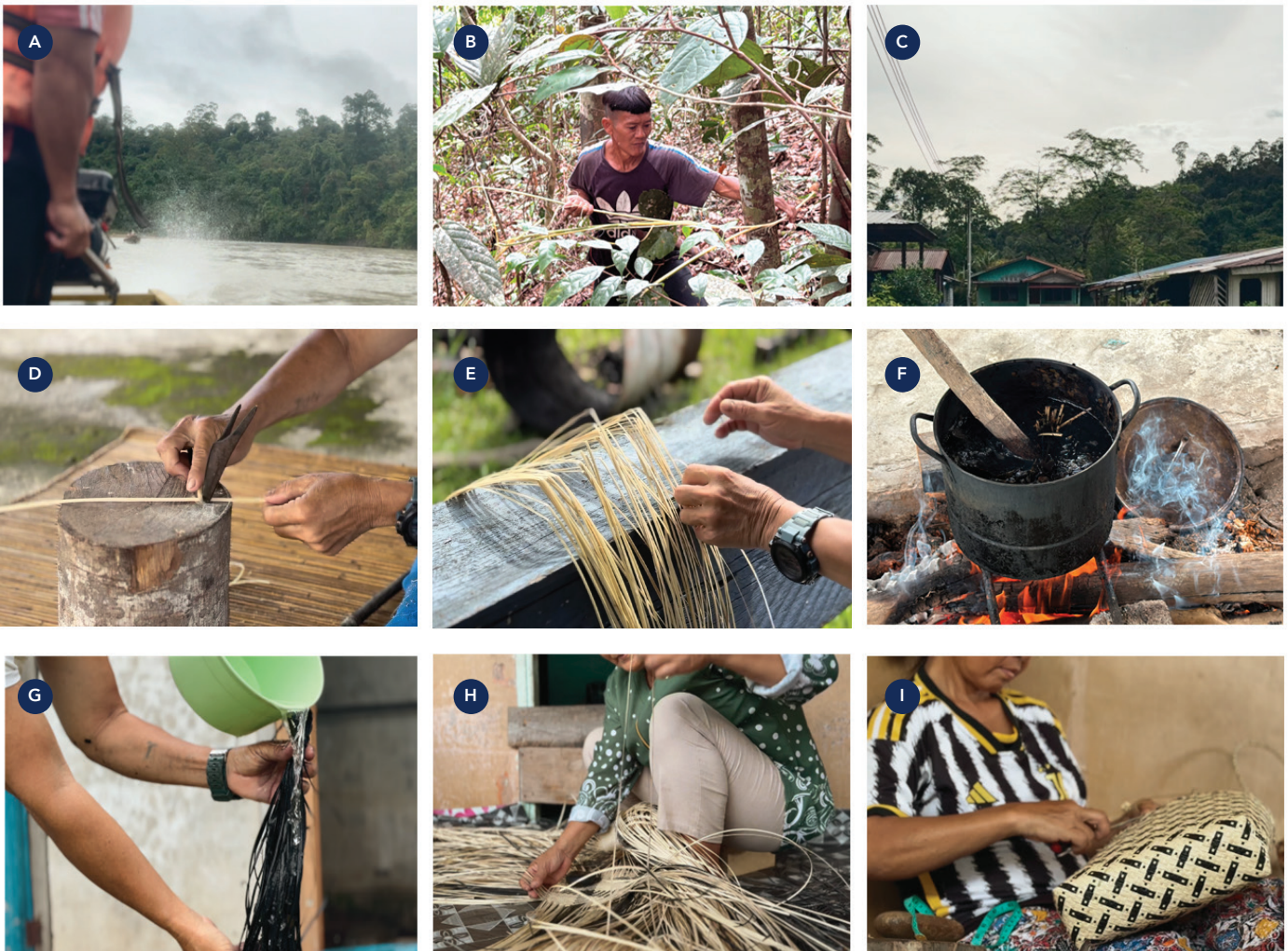


Figure 6. (A) Traversing the river on a motorboat; (B) Penan villager stripping leaves off a wild rattan palm located on a hike through the Sarawakian forest; (C) returning to Long Lilim village in the evening; (D) preparing the rattan by shaving rattan stems into strips after cleaning; (E) drying rattan strips on a communal railing; (F) dyeing rattan in a pot of boiling plant-based dye for a day to stain them black; (G) rinsing rattan strips with water to remove excess dye; (H) weaving rattan strips to create a pattern by alternating the colour of rattan used; (I) measuring the final product with a ruler for quality control

rattan to immediately bring us through the weaving process. They sat cross-legged on mats, their hands moving with practised rhythm, interlacing strips of natural and dyed rattan to create striking geometric designs. Each pattern is traced from memory, reflecting cultural knowledge embedded in the craft. As we struggled to comprehend the intricate pattern we were weaving, our bodies ached from our hunched position on the mat, but the women sat there unfazed, patiently guiding us with the weaving pattern whenever we needed help. At the end of the four-hour weaving session, we had managed to produce only a small square-shaped coaster of the most basic pattern, whereas the weavers had completed weaving their bags of distinctly more intricate patterns.

Data Analysis: What We Found

Communication Barriers

Our observations of interactions among the Penan, both within the community and with the headman, strongly support our research's characterization of them as a collectivist society shaped by shared decision making and collaborative goals. This is consistent with Davis's account of the Penan as an egalitarian hunter-gatherer community whose social life is organized around collective obligation and sharing.¹⁶ In this context, communication from NGOs and government agencies may be less effective when delivered in a formal or impersonal manner which may not reflect the relational norms that guide social interaction in the village. By contrast, messages personally delivered by local known people (e.g., headman, pastors) were well received with respect and attentiveness, because the Penan are "originally very shy people who prefer familiarity, and will prefer if you are a friend of a friend," according to Violette Tan, director of Helping Hands Penan (HHP). We observed this firsthand on site, where the Penan consistently

treated their pastors and headmen with visible respect, including attentive listening, calm posture, and deferential body language during conversation and meetings. "The headman resolves conflicts and meets with well-respected government officials, while the pastor commands equal respect, serving villages across the region," Violette told us. This highlights the importance of relational communication, particularly when brokering sensitive issues. Further consideration should be given to the mode of communication as community leaders and religious leaders serve different roles in the village.

Communication between HHP and the Long Lilim community is currently concentrated in the hands of a small number of intermediaries, which risks limiting who is informed about available opportunities with the organization. This bottleneck is compounded by an oversupply of weavers, so without deliberate outreach, many skilled weavers may never hear about, let alone participate in HHP's programs. This underscores the need for trusted intermediaries who engage relationally and actively broker inclusion.

Handicrafts Can't Reach Markets

The Penan women's rattan handicrafts embody both cultural heritage and economic potential, yet their livelihood remains constrained by structural barriers to wider markets. Weaving demands patience and skill that rarely translates into appropriate recompense. The sale of rattan products faces significant challenges due to distance, high transport costs, and limited market demand. Violette told us that "the Penan women who weave do not have geographical access to markets, so HHP buys their products from them directly, which gives them funds." This underscores that HHP remains a key stakeholder, bridging the Penan weavers' products to the market of woven products. However, the unaffiliated weavers do not have the same level of accessibility. To address these challenges, inclusion strategies that improve non-affiliated weavers' access to markets are not merely desirable but essential. But unless such strategies are designed carefully, they risk introducing subtle inequalities of their own. At the village fair, for instance, we noted that the crafts

¹⁶ Davis, "The Penan."

by both HHP-affiliated and -unaffiliated weavers were similar in design and quality. This suggests that the impact of social enterprise interventions may not be as equitably distributed as intended.

Interviews as Research

Our fieldwork notes were complemented by qualitative data obtained from community interviews. At Long Lilim, we conducted in-person, semi-structured interviews with six Penan weavers. We chose interviewees through convenience sampling according to their availability and willingness to participate. Participants were also chosen across varying levels of affiliation with Helping Hands Penan (HHP). Some weavers we interviewed had regular contact with HHP to sell their handicrafts, while others had little or no contact with HHP. Our goal was to examine the relationship between affiliation level and the degree of income stability and institutional support weavers received.

Within the interview environment, there were three main parties involved. There was the weaver, the researchers, a lead interviewer, and a scribe as well as the translator(s) to aid two-way translation from the local Penan language to English. On site, we tapped community resources to create a chain of translation, translating our interview questions from English to Malay then to the local Penan language, and back. This need arose because the weavers spoke the Penan language and there was a limited number of people who knew both that language and English in the village. Two translators were involved for a single interview when these people were unavailable. One translator translated the Penan language to Malay, and another translated from Malay to English. We recognize that some interview responses could get lost in translation or convey only the gist of the participants' full responses. The interviews were conducted in quiet areas of the village, such as the outdoor pavilion, to ensure independent responses from the participants.

In each interview we sought to understand the socioeconomic situation of the Penan weavers, with an emphasis on income security and on their individual perceptions of the degree of empowerment their work provided. Basic demographic questions like age and household structure were also asked to contextualize their specific circumstances. Given the low educational levels of most weavers, we intentionally asked simple questions that were easy to understand and respond to in order to streamline the translation process across languages. Questions often revolved around their income level, hardships faced, as well as gaps identified.

We knew that participants might not be comfortable giving their consent by signing hard-copy documents. We therefore opted for verbal consent recordings to mitigate this ethical concern, with the help of onsite translators.

| Data Transformation

The primary data in this study involved transcribed, translated interviews. To convert the transcribed interviews into meaningful data, we identified segments of text within the interview transcripts that were related to our objective, then assigned descriptive codes or labels to them. We used this same framework to break down our raw transcripts into sizable chunks for analysis. Specific phrases or code words reflected the weavers' similar ideas and lived experiences. The frequency of certain code words informed us about the recurrence of certain issues, for example, "income" and "lack of transportation."

Because our translators were not professionally trained, and because the translation went through two layers (Penan to Malay and Malay to English), some nuance is likely to have been lost in translation during the interview. We were confident that the key ideas were conveyed during the interview, but less confident regarding specific quotations. Translators may also have interjected additional contextual information or their own interpretation of the weavers' inputs. This influenced our decisions on how we coded our data. Nevertheless, we did our best in ensuring that each interview was transcribed accurately. We had multiple people transcribing in

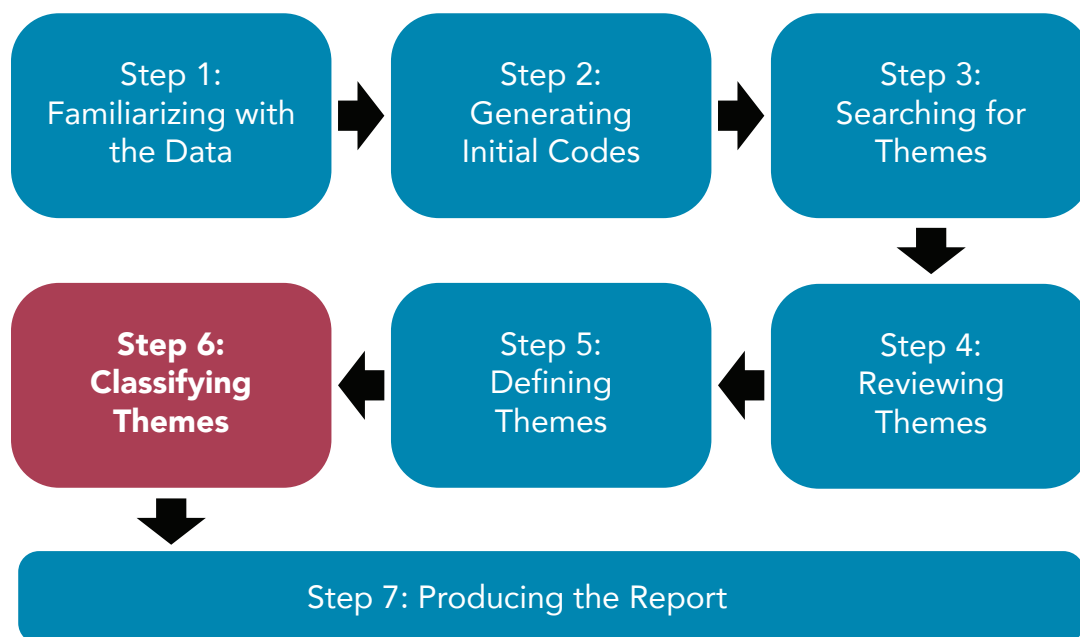


Figure 7. The seven steps in thematic analysis (Kadir, Lokman, and Tsuchiya, "Emotional Responses Towards Unity")

the field, ensuring fidelity to the interviewees' words. After each interview session, we cross-checked transcribed notes to ensure consistency across scribes. Following this, we used coding to convert the raw transcripts into analytical data.

The unit of analysis in this study was primarily the coded labels or meaning units within our interview data and jottings. These units ranged from singular words, such as *income*, to phrases such as "lack of transportation," depending on the context. By zooming in on these meaning units, we could systematically categorize research themes, and guide the direction of our discussion.

Data Analysis

We used thematically coded and categorized qualitative data from interview transcripts into groups. Thematic analysis is a widely recognized, flexible qualitative method for identifying and analyzing patterns in data.¹⁷ We followed the steps listed in Figure 7.

1. Familiarizing with the data. We immersed ourselves in the data by thoroughly reading the transcripts and reflecting on our lived experiences during our fieldwork in Long Lilim Village. Our understanding and interpretation of our interview data were shaped by our embodied experiences and sensory knowledge, instilling empathy and depth in our understanding of our data.¹⁸ Sensory knowledge refers to intuitive insights gained through direct sensory immersion — sights, sounds, smells, and shared activities — rather than abstract analysis from reading second-hand reports. Our fieldwork in Long Lilim village provided this first-hand context. This experience fosters empathy by allowing us to feel the rhythms of communal life, appreciate unspoken social cues, and grasp values such as collectivism in a visceral way.

2. Generating initial codes. The data were systematically coded. This involved us identifying common, noteworthy words or phrases across the entire data set (i.e., transcripts and jottings) then coding them using both inductive (directly emerged from data) and deductive methods (informed by

17 Shamsiah Abd Kadir, Anitawati Mohd Lokman, and Toshio Tsuchiya, "Emotional Responses towards Unity Youtube Videos: Experts vs. Viewers Perspectives," *International Journal of Affective Engineering* 20, no. 4 (2021): 225–35; Skovdal, and Cornish, "Qualitative Research for Development," 1–30.

18 O'Reilly, "Sensing the Ice."

our research questions and understanding of their environment).

3. Searching for themes. After our codes were generated and identified, they were collated and grouped into themes. This involved observing trends in data, the frequency of codes, and establishing connections between them to form broader overarching themes. For example, observing how “low income” was often tied to HHP-unaffiliated Penan weavers, compared to HHP-affiliated weavers. This allowed us to derive insights on how the level of income was likely influenced by their respective levels of affiliation with HHP.

4. Reviewing themes. First, we checked our themes against our coded labels or meaning units to ensure accurate representation of qualitative data. Next, we reviewed the themes in relation to other themes established to ensure we captured the essence of the Penan weavers’ experiences with HHP. This was particularly important given the inaccuracies that can arise from the language barrier and its associated chain of translation.

5. Defining and naming themes. Every theme was distinctly identified, defined, and labelled. This involved us calibrating each theme’s definition, and carefully articulating what each theme represented. For example, we distinguished a theme on “collective decision making” from one on “respect for authority,” even though both involved group interactions. We made the distinction by examining whether the emphasis was on mutual participation or on deference to the headman. Subthemes were also identified where appropriate to help give more nuance to our findings.

6. Producing the report. This is the final phase in our thematic analysis involving constructing a consistent and coherent narrative. This included giving detailed accounts of each theme, backed up by citing specific codes or giving examples, to validate the analytical claims. Through interviews with weavers affiliated with HHP and those who were not, we came to understand some of the strengths and weaknesses of HHP’s interventions.

What We Heard: Social Enterprises Don’t Reach Everyone

Selling handicrafts served as the participants’ primary source of income. It funded daily household necessities like food, clothing, medical transport, and children’s education. On average, participants earned MYR 300 (around USD 76) per month from such sales, though income fluctuated across months depending on the number of orders they received.

Across all six interviews, we heard about women’s desire to learn new skills. Participants showed interest in learning sewing and embellishment to improve the overall attractiveness of the bags beyond the basic design with handles. Weavers shared examples of sewing on the inner fabric linings of the bags and adding certain embellishments to enhance the design of the woven bags. One weaver told us “I hope that HHP can provide embellishments (e.g., beads) to increase variety for the bags we make.” Participants also shared their experiences of government-run workshops in villages where they learned some of these skills and expressed interest in continuing such programs.

When asked about their aspirations for their families in the next few years, most participants said they wished that they could earn a higher income from weaving the handicrafts, so that they and their families could achieve a higher standard of living. Some participants also had hopes for their children to start, or continue pursuing their education, so they would be able to work a “proper” job and raise their family out of their poverty cycle.

The most apparent disparity we observed in the participants’ responses was the variation in their income levels by level of affiliation with HHP. Violette told us that “HHP buys woven products from

affiliated weavers directly, and those proceeds go towards funding the weavers' children's education." Weavers who had benefited from HHP's intervention spoke from personal experience while unaffiliated weavers did not benefit but could see their neighbours' changes, such as the impact on their income streams, standard of living, and children's education.¹⁹

A HHP-affiliated weaver told us "HHP supported me financially by buying my crafts. It gave me enough money to cover household expenses and transportation costs to send my children to school." By contrast, an unaffiliated weaver said "I only hope I can earn more from my crafts. My children dropped out and stopped going to school before O-Levels. More money would mean my children could go back to school."²⁰ HHP-affiliated weavers reported more consistent levels of income that could reach up to MYR 1,000 (around USD 250) per month in the event of bulk orders, while those unaffiliated with HHP saw income levels as low as MYR 100 (around USD 25) per month.

This disparity indicates the central role that organizational support can play in transporting products to markets and bringing in a steady flow of income, especially in difficult-to-reach environments where Penan villages are scattered. The difference in weavers' incomes ultimately boils down to distributional challenges that participants described.

Lessons Learned

| Reaching HHP-Unaffiliated Weavers

Beyond geographical isolation, our results helped us to reconceptualize the "hardest-to-reach" as a matter of distributional justice. Helping Hands

Penan (HHP) has limited purchasing capacity and tends to reengage familiar, HHP-affiliated weavers. This perpetuates structural inequalities, excluding HHP-unaffiliated weavers from stable markets, income streams (as seen from HHP-affiliated weavers earning up to 1,000 MYR per month, compared to unaffiliated weavers earning as low as 100 MYR per month), and educational sponsorships despite their comparable skill levels. This mirrors broader challenges in scaling social enterprises, where access and inclusion are often constrained by relational and infrastructural barriers. HHP-unaffiliated weavers lack the networks, education, and personal connections with volunteers that facilitate access to the market and therefore stronger income.

Drawing on the framework for scaling market penetration for social enterprises, an efficient strategy would be to expand the Penan weavers' reach in existing markets.²¹ Currently, HHP's penetrated market is restricted to affiliated members due to structural imbalance. Redistributive inclusion entails purchase of handicrafts being expanded to include non-affiliated sellers outside of HHP's existing reach. Hence, we see that redistributive inclusion is a necessary strategy to correct structural imbalance, which in turn enhances market penetration.²² Intentional inclusion strategies must be designed to bring these "hardest-to-reach" weavers into development pathways and income levels comparable to those of HHP-affiliated weavers. For example, HHP could set quotas on woven products purchased from HHP-affiliated weavers, thereby reserving space for HHP-unaffiliated weavers to participate. Since HHP purchases directly from weavers, such quotas would ensure a steadier income stream for all, reduce intra-community disparities, and thereby promote equity within the weaving community.

Genuine inclusion requires justice-oriented strategies that engage with the broader ecology of demand, trust, and inter-village collaboration. In Penan society, children learn appropriate social conduct

19 Morten Skovdal and Flora Cornish, *Qualitative Research for Development: A Guide for Practitioners* (Rugby: Practical Action Publishing, 2015).

20 O-Levels (Ordinary Level) are subject-based academic qualifications, typically taken by students aged 15 to 16 at the end of secondary school.

21 Bocken, Fil, and Prabhu, "Scaling up Social Businesses."

22 Linda Heaton, Emma Halliday, Paula Wheeler, Adele Ring, Harris Kaloudis, and Jennie Popay, "Strengthening Community Empowerment Initiatives as a Route to Greater Equity: An English Case Study," *Community Development Journal* (September 2024). [🔗](#)

through observation rather than strict discipline, with the value of sharing emphasized from a very young age.²³ For example, boys are taught to meticulously portion out meat from even the smallest animal, distributing equal shares among all the other children. For a community that has such an ingrained practice of sharing, weavers unaffiliated with HHP need to be recognized as equal contributors to the community's cultural and economic life. Such integration means slower operational flows for HHP since it involves further outreach to new weavers and setting up new sales channels.

In other words, HHP needs to accept slower, iterative engagement when introducing more HHP-unaffiliated women weavers to HHP on an organizational level. Social enterprises succeed when they embed redistributive mechanisms, build organizational capacity, and communicate through culturally grounded, trust-based channels.

Developing Relational and Culturally Grounded Communication Streams

Reducing organizational information barriers is essential but not sufficient to benefit the whole community because communication must be embedded within a broader justice-oriented inclusion strategy. HHP's limited purchasing capacity and tendency to reengage HHP-affiliated weavers perpetuates a structural imbalance, where HHP-unaffiliated weavers remain excluded not only from income but also informational flows. Addressing this requires communication channels that do more than transmit information. They must retain trust, negotiate fairness, and prepare communities for the difficult conversations around redistributing opportunities.

New projects are brought through local leaders who tend to have higher levels of education, and those who are directly affiliated with HHP rather than solely through distant organizational channels. This form of information flow arises from the Penan community's strong preference for familiarity and trust, and the communication barriers they face. To expand the

channel size through which HHP-unaffiliated weavers can learn about and choose to participate in HHP's activities, we emphasize the need to purposefully improve village-level communication that leverages current weaver networks and locally appropriate messaging.

According to Wade Davis, the Penan, similar to other nomadic tribes, are largely egalitarian and do not have strict hierarchical systems.²⁴ In Penan society, one of the most notable transgressions is "*see hun*," which roughly translates to refusing to share resources. In other words, the Penan would support collaborative interventions rather than stringent top-down implementations.

Therefore, we recommend that HHP co-design sharing sessions with the Penan villagers to surface weavers' pain points and openly discuss the rationale for redistributive inclusion. Rather than top-down campaigns, these sessions should be dialogic, paced according to village rhythms, and attentive to the weavers' broader responsibilities beyond weaving (e.g., childcare, domestic duties, and social responsibilities). Locally appropriate messaging must consider not just language but tone, pacing, and relational trust. By embedding justice-oriented redistribution within culturally grounded communication streams, HHP can ensure that inclusion strategies are not perceived as external imposition but as community-driven commitments to fairness. Community empowerment initiatives can reduce inequities when they explicitly address power imbalances and value local knowledge. Success depends on participatory design and redistribution of resources rather than top-down interventions.

“Community empowerment initiatives can reduce inequities when they explicitly address power imbalances and value local knowledge.”

²³ Davis, "The Penan."

²⁴ Ibid.

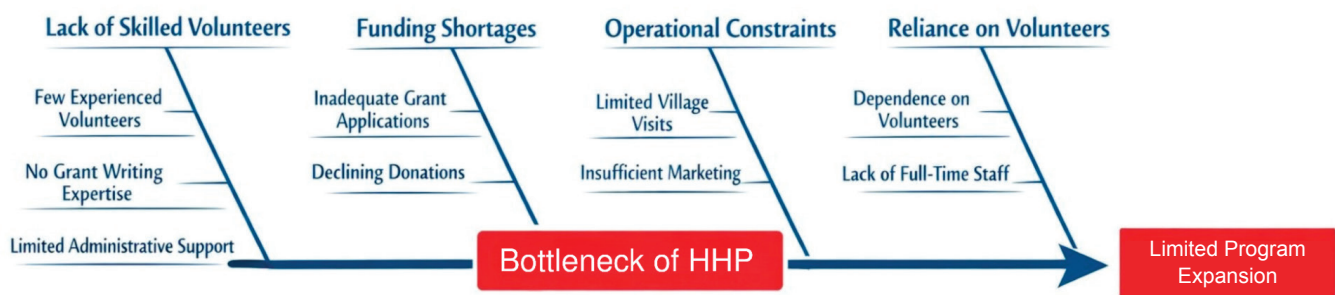


Figure 8. The bottleneck of HHP that results in limited program expansion

Limited Volunteer Capacity

Limited volunteer capacity sits upstream of many other obstacles: without grants, HHP is unable to expand educational sponsorships or fund more trips to Long Lilim due to steadily declining profits over the years. Hence, the impact of offering more educational sponsorships is limited not by community demand, but by the bottleneck of organizational capacity in carrying out strategic and administrative tasks that are crucial for program expansion.

Our review of HHP's operational model indicates that volunteer capacity is an institutional bottleneck that shapes what kinds of interventions are feasible, rather than being a secondary operational issue. HHP's ability to respond to community requests for educational sponsorships and training is constrained by the unavailability of funds. A shortage of skilled volunteers exacerbates this problem as expertise in grant writing, administration, and marketing is essential to secure funding. As a social enterprise, HHP relies heavily on volunteers for its operational chain, from making trips to villages to producing marketing collateral. One strength of HHP's model is that Penan children who graduate with formal education often return as volunteers, creating a multiplier effect that uplifts others in the community.

Given that skilled volunteer capacity remains a key constraint, we recommend that HHP builds partnerships with local government bodies and civil society groups to ensure a more stable pipeline of skilled volunteers. This would provide a more reliable stream of individuals with specialized expertise who can also learn from the community. Such partnerships could be developed passively through

government accelerator programs and enrolment in public schemes focused on skill development and employment generation, or actively reaching out to members of authoritative bodies enhancing public employment. These kinds of partnerships or volunteer relationships need to be planned carefully to prevent excessive reliance on any single organization. To achieve this, HHP should build robust in-house capacity by actively ensuring that experienced volunteers teach skills to new ones, and by codifying these skills internally, such as through standard operating procedures, when engaging external partners.

This aligns with broader discussions on technocratic development, where striking a balance between local agency and outside expertise is crucial. Such a balance will preserve the longevity of HHP's volunteer base, avoid burnout from excessive responsibilities, and prevent over-reliance on any one institution or group of volunteers.

Overcoming Obstacles for Weavers to Attend Upskilling Workshops

The Penan community's remote living conditions make transportation to town-based workshops expensive and logistically complex. The community already faces difficulties in terms of income, so covering the costs of hiring drivers and travelling to the city is a tall order. People also feel wary of the potential for drastic changes to their way of life. And travelling to the city forces them to leave childcare to others, which they are reluctant to do, given their strong attachment to their children.

Second, psychological barriers stem from the potential for drastic changes to their way of life. In the absence of trusted guides to help them navigate unfamiliar systems, the Penan women's willingness and ability to travel to the city centre for handicraft workshops organized by the Sarawak Craft Council are further hindered. This limits their ability to learn new skills that could enhance their weaving abilities and increase the appeal of their handicrafts.

Despite these challenges and practical obstacles, the weavers expressed a strong desire for sewing and more skill-development classes. The interviews highlighted how accessibility and demand do not always go hand-in-hand. Women may desire training and upskilling but are reluctant to leave the village due to care obligations or transportation fees. HHP can therefore deploy skills training that is co-designed with the weavers and better associated with their Penan roots. For example, HHP could work with existing government councils or NGOs that have experience in hosting workshops in villages so that the weavers do not have to travel long distances. HHP can replicate or tweak such workshops to provide accessible sewing and business skills workshops for all weavers, whether or not they are affiliated with the organization.

Through conversations and interviews with the weavers, we learned that skills upgrading needs to be multidimensional. In addition to sophisticated sewing methods and product diversification, the weavers need fundamental business skills such as pricing and basic bookkeeping to improve the marketing of their woven products to achieve more stable income. Additionally, we realized that courses could be made less intimidating and more culturally relevant by matching training with existing communal practices. For example, women might be more open to weaving together as a group in workshops. As researchers, the lesson is for us to see skills programs not as isolated "interventions," but rather co-designed efforts to aid community learning and improvements.

Conclusion

Our findings reveal the structural barriers that HHP must address concurrently to uplift the weavers and reduce their relative socioeconomic marginalization. First, despite the organization's original intention of providing income stabilization for the Indigenous weaving community, it has excluded HHP-unaffiliated weavers. Second, communication channels that rely on a small number of educated intermediaries inadvertently replicate the same hierarchical structures that marginalize HHP-unaffiliated weavers. Third, a volunteer capacity bottleneck constrains HHP's operational ability to meet the community's needs regardless of how well its solutions are designed. These three barriers are interdependent so resolving one without the other produces limited change.

We recognize that the recommendations we proposed (i.e., redistributive quotas, co-designed communication sessions, village-based upskilling workshops, and volunteer pipeline development) depend on HHP first addressing its funding constraints. Additionally, the persistent low demand for Indigenous handicrafts represents an external challenge that is beyond the scope of this study but cannot be ignored in practice. Sustained economic empowerment for Penan weavers ultimately requires not just improving the internal HHP network of resources and operations, but also improving their wider network of market development, greater advocacy, and more institutional partnerships. Improving access is not just about communication or logistics, but also about justice. Ultimately, the work of social enterprises like HHP is to ensure that the weavers' skills and cultural traditions are recognized by markets so that they can preserve their cultural traditions while also enjoying greater financial stability and self-sufficiency.

Research Team



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Cheyenne Low is a third-year student at Singapore Management University's College of Integrative Studies, pursuing an interdisciplinary major called Behavioural Economics and Analytics. Her studies combine psychological theory, economic rigour, and data analytics to design, test, and implement behaviourally informed interventions through nudges, heuristics, and choice architecture. With experience at the Ministry of Manpower in shaping user-centric policies, Cheyenne aims to shape interventions that bridge the gap between human behaviour and equitable outcomes, ensuring that evidence-based solutions reach and impact communities that require them the most.



Chloe Tan is a third-year student at Singapore Management University's College of Integrative Studies, pursuing an interdisciplinary major in sustainability and marketing analytics. Chloe has experiences in Shopee, Global Centre of Marine Decarbonisation, and overseas community service projects. Alongside community work, she has also led fireside chats with Singapore Members of Parliament on youth and sustainability-focused discussions. Chloe hopes to help businesses and consumers see their environmental impact more visibly to ensure long-term business resilience in a competitive resource-constrained world.



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Sonny Rosenthal is an internationally recognized scholar in environmental and science communication, risk information seeking, and sustainability behaviour change, with extensive contributions to research, teaching, and public engagement across Asia and the United States. His work bridges communication theory and behavioural science to design, implement, and evaluate interventions for sustainability, public health, and technology adoption. Since 2014, he has taken groups of students overseas to study and support the work of nonprofits and social businesses.



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