UTS UNIVERSITY OF TECHNOLOGY SYDNEY

Considering Indigenous Approaches and Human-Centred Design (HCD) to Design for Local Health Systems in East Kalimantan

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under the supervision of

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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, Juhri Selamet, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the School of Design of the Faculty of Design, Architecture and Building at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

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ABSTRACT

CONSIDERING INDIGENOUS APPROACHES AND HUMAN-CENTRED DESIGN (HCD) TO DESIGN FOR LOCAL HEALTH SYSTEMS IN EAST KALIMANTAN

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This dissertation focuses on considering Indigenous standpoints and human-centred design for designing local health systems. Looking at the context of Indigenous Dayak in East Kalimantan, who face challenges living under current health systems in the region, the research sets out to explore how local voices, which are often marginalised, can be included in designing local health systems through consideration of Indigenous standpoints alongside human-centred design. The premise is that questions regarding the better design of local health systems must be answered by local people and include their voices.

The assertion underpinning this thesis is that the inclusion of Indigenous approaches alongside human-centred design can provide a better understanding of questions regarding better design for local health systems. Drawing from qualitative fieldwork conducted in an Indigenous Dayak village in East Kalimantan, this study contributes to theoretical, methodological, empirical, and practical dimensions within its domain. Furthermore, it leverages insights from Indigenous and design scholars to realign the research agenda in health and design, advocating for a localised approach that prioritises the inclusion of local voices, participation, and collaborative efforts.

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GLOSSARY OF TERMS / DEFINITIONS

(Based on this text)

DAYAK: Native people or Indigenous people or local people in Berau Regency, East Kalimantan, Indonesia.

COMMUNITY: A group of individuals with a shared characteristic residing together within a specific area of the broader society.

FOGGING: Fogging is a method employed to exterminate insects. It utilises a finely sprayed pesticide, delivered through an aerosol, and directed using a blower.

HEALTH: As stated in the World Health Organization (WHO) constitution in 1948, 'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (Schramme, 2023, p. 201; WHO, 1948, p. 100).

HEALTH PROMOTION: is the process of empowering individuals to gain greater control over and enhance their health (WHO, 1998).

HEALTH SYSTEMS: Health systems encompass all activities aimed at promoting, restoring, or maintaining health. This includes a wide range of organised services and functions, which can involve personal and non-personal health care delivery, public health interventions, health financing, workforce allocation, health information systems, and policy frameworks. A health system is structured around the needs and resources of the community it serves and is more than just a facility that delivers medicines or health care services. It aims to achieve better health outcomes by efficiently using various resources to improve the collective and individual health care services as per the population demands.

HUMAN-CENTRED DESIGN: A creative design approach used to put the people who are being designed for at the centre of the design process. The voices of Dayak people are at the cenrer of this text.

INDIGENOUS: "Indigenous" can have different meanings. I use this term for my research context in Indonesia. My interpretation of the term Indigenous follows the Indonesian translation. Indigenous is defined as native (*pribumi*) in Indonesian; Indigenous people, "those whose ancestors were the original, pre-colonial people of a region"(UN, 2007). In this writing, Indigenous' identifies local or native people in a region, for example, the Dayak or Banjar people, or those of Papua, Manado or Batak.

INDIGENOUS/LOCAL KNOWLEDGE: a term referring to the local methods/ways of understanding, knowing, perceiving, and thinking that are transmitted orally and visually from one generation to the next among local or native communities.

INDIGENOUS DAYAK VILLAGE: In Indonesia, generally, an Indigenous village is a governmental unit managed by Indigenous communities, possessing the right to govern its territory and the lives of the community within the Indigenous village environment. An Indigenous village is also a traditional community with a focus on customary and traditional functions. In this document, the Indigenous Dayak village refers to a village whose residents are the Dayak Indigenous people, who still practise Dayak customs.

INDIGENOUS STANDPOINT: An approach that centres understanding of how Indigenous people navigate the difficulties of their life experiences within spaces and places which contest their knowledge.

KADER POSYANDU: is the name of all volunteers who support Posyandu programs and activities in their community.

LOCALISED DESIGN INTENTION: In this research, localised design intention is a way to include and accommodate the voices and collaboration of local people in design discussions and processes.

LOCAL HEALTH SYSTEMS: Local health systems refer to the community-specific networks of healthcare providers, facilities, and resources that are organised to deliver health services to a specific geographic area or population. These systems focus on addressing the unique health needs and challenges of the local community, incorporating local practices, cultures, and resources to improve health outcomes effectively.

MITRA: is a term to describe a co-worker, partner, collaborator, or friend who is seen as equal.

NIAT: Intention (*see* 2.3.1 Understanding *niat* (intention))

REGENCY: *Kabupaten* (in Indonesian) is the administrative division after provinces. While a province in Indonesia is headed by a governor, a regency is headed by a regent. After regency, there is a district (*kecamatan)* headed by a *camat* (district head). The lowest administrative division is *desa* or *kelurahan* (village), headed by a *lurah* (head of village). The study is conducted in Long Lanuk Dayak village, located in the Sambaliung district of Berau regency, East Kalimantan province, Indonesia. I also collaborate closely with the Berau regency administrative region.

PE’ SIU: *Pe’ siu* translates to "*bercerita*" in Indonesian or "sharing stories" in English. The term for an interview,"*wawancara*" in Indonesia, is often perceived as a formal way to pose questions, which may not resonate well with local people in this context.

POSYANDU: Pusat Layanan Terpadu (Integrated Health and Nutrition Service Centre) is established to offer essential health services, including family planning, maternal and child health, nutrition, immunisation, and disease control (Nazri et al., 2016).

PUSKESMAS: Pusat Kesehatan Masyarakat *(*Community Health Centre) is a health facility striving to coordinate community health initiatives and primary-level individual care.

PUSTU*:* Puskesmas Pembantu (Sub-community Health Centre) is health facility to serve for villages in rural areas.

WICKED PROBLEMS: refers to issues that are challenging or impossible to resolve due to incomplete, contradictory, and evolving requirements that are often hard to identify. (Rittel & Webber, 1973).

ABBREVIATIONS

BPJS – Badan Penyelenggara Jaminan Sosial Kesehatan (Social Security Agency on Health)

BPS – Badan Pusat Statistik (Central Agency on Statistics)

HCD – Human-centred design

UN – United Nations

WHO – World Health Organization

POSYANDU – Pusat Layanan Terpadu (Health and Nutrition Integrated Service Centre)

PUSKESMAS – Pusat Kesehatan Masyarakat (Community Health Centre)

PUSTU – Puskesmas Pembantu (Sub-community Health Centre)

FOREWORD

I once asked my father, “Why do people move away from the village?” My village is a remote community situated by the river. My school was at one end of the village, opposite where my family lived. As I walked home from school, I passed houses that were starting to empty. My father did not answer my question. At that time, he already had other plans, and shortly after, at the end of the school year, my family moved to another village which is closer to the district town.

The decision for my family to relocate was primarily driven by the pursuit of better educational opportunities and healthcare (as one of my brother's health conditions was worsening), necessitated by the prevalent conditions in our native village and exacerbated by the economic turmoil of the time. The village, while close-knit and familiar, offered only elementary education, due to its lack of infrastructure and transportation, which hindered access to higher educational institutions. This educational limitation posed a significant barrier to personal and community growth, as it curtailed the professional aspirations and economic mobility of its residents, including many of my cousins, who could not progress beyond elementary schooling. Furthermore, the health services were virtually non-existent; this issue became critical when my older brother's health began to deteriorate. The absence of local healthcare facilities meant that even minor illnesses became major crises for families like mine, driving us to seek better-equipped locales. This move, although still within the same district and not far in terms of distance, plunged us into economic hardship, which was amplified by the 1997 monetary crisis sweeping through the country. As the national economy buckled under severe inflation and currency devaluation, the cost of living soared, making basic necessities like food and medicine not only more expensive but also harder to obtain.

The 1997 Indonesian financial crisis not only strained urban economies but deeply penetrated rural communities, severely impacting their health infrastructure and economic

stability. According to scholarly analysis by Waters et al. (Waters et al., 2003), rural areas, which were already poorly serviced in terms of healthcare, faced a drastic reduction in available health services as the government slashed healthcare funding. This situation resulted in many healthcare professionals being laid off or receiving reduced salaries, which in turn compromised both the quality and availability of medical care (Mahendradhata et al., 2017). The consequent deterioration in healthcare infrastructure and the increase in poverty led to poorer general health, with malnutrition and related diseases becoming more rampant, as documented by previous researchers (Mahendradhata et al., 2017; Soekirman, 2001; Waters et al., 2003). The nutritional decline, coupled with the reduced efficacy of health services, resulted in a notable increase in mortality rates in these regions, particularly during and immediately after the crisis (Baker, 1998; Soekirman, 2001). These developments underscored the critical interlinkages between financial systems and healthcare outcomes, particularly in rural settings, where the buffers against economic shocks are minimal, illustrating the profound and lasting impacts of economic policies and conditions on public health and well-being.

Despite the global discourse around technological and AI advancements that mark the 21st century, rural and remote communities like my native village continue to grapple with substandard health systems that have barely moved forward since the financial crises of decades past. Such villages, often inhabited by families who have lived there for generations, starkly illustrate the disparities in fulfillment of basic human rights. The right to access education and healthcare—deemed universal—remains a distant reality for these populations. My own upbringing in a village devoid of electricity and clean water starkly highlights these discrepancies. While urban areas might celebrate the integration of cutting-edge technologies and infrastructural advancements, rural communities frequently contend with intermittent electricity and unreliable water services. The pervasive inequality is not just a local anomaly but a global issue that transcends geographic and economic borders, as noted by Qureshi (2023). This disparity not only

questions the equity of resource distribution but also points to a significant oversight in policy prioritisation that continues to leave rural areas in a perpetual state of disadvantage.

This infrastructural lag in providing basic amenities like clean water and consistent electricity supply does more than just perpetuate inconvenience—it critically undermines both health and educational outcomes in these areas. Mascherini et al. (Mascherini et al., 2023) emphasise that without these fundamental services, the cycle of disadvantage not only continues but intensifies, restricting socio-economic development and exacerbating the rural-urban divide. The failure to extend technological progress to these underserved areas reflects a broader issue of inequality that technology, in its current application, fails to rectify. Such a scenario necessitates a reevaluation of how advancements are deployed and who they truly benefit. Ensuring that the dividends of technological advancements are more equitably shared must be a priority in global development strategies. This approach would not only help bridge the vast chasm between rural and urban capabilities but also align more closely with the ethical imperatives of equity and justice in global health and education.

I recognise that my personal identity and background profoundly influence my approach to this research topic. As someone with a background in the design field who comes from a remote area, I am always interested in exploring the critical contributions that design can make in rural or remote areas and among underserved populations. While design scholars often champion the notion that design inherently seeks to solve problems, I am compelled to explore critical solutions that are deeply contextual—solutions that not only solve problems but also resonate with the specific needs and conditions of the communities they are intended for. This involves a critical discussion about the origins of these solutions, their relevance to the local contexts, and the extent to which they incorporate collaborative processes with the marginalised populations of these remote areas. It is crucial that these solutions are not parachuted in but developed through

processes that actively involve local insights and voices, ensuring not only that they are appropriate but are also empowering for the communities they serve.

In remote areas, where people have been overlooked in the wider socio-economic narrative, I see an urgent need to change the way design is discussed and implemented. I argue that the design process must go beyond traditional methodologies and adopt a participatory approach that places these communities at its core. This means not just consulting but also actively listening, sharing, and collaborating with local communities to co-create solutions tailored to their unique challenges and aspirations. By doing this, I believe, design can be transformed from a top-down imposition into a meaningful tool for social and infrastructural development. The goal is to ensure that design does not replicate the scrutiny and exclusion these underserved communities typically encounter, but instead becomes a catalyst for inclusion and change, truly reflecting the needs and voices of those it seeks to help.

CHAPTER 1 INTRODUCTION: LOCALISED RESEARCH SETTING AND LANDSCAPE

In this introductory chapter, a brief contextualisation and outline of the topic and approach for this research project are provided. It discusses the research questions and objectives and briefly highlights the contributions of this study. The chapter introduces the theoretical and methodological approaches, as well as an overview of the context, location, and the Dayak people, as they are central to this thesis. Furthermore, in this chapter, a concise description of the researcher's position and intention as the author and investigator is provided, emphasising the commitment to transparency. Finally, this chapter includes an outline of all the chapters presented in this dissertation.

1.1 Background

This study is about Dayak people and their local health from Indigenous and design approaches. The Coronavirus disease 2019 (COVID-19) pandemic has exposed the challenges faced by the Indigenous Dayak people in accessing some basic human rights: health care and health information. In some Dayak villages, there was little information about the pandemic or health-related guidelines, and that was putting Indigenous communities at risk (Niko, 2020). Many contend that the government should adopt a more proactive approach by dispatching health workers to remote Indigenous communities to administer vaccinations, rather than expecting these communities to leave their settlements and travel to vaccination centres (Ulung & Ekawati, 2021). This is because most Indigenous Dayak people live in isolated areas that are 20 to 80 kilometres (12.4 to 49.7 miles) from the district health centre; thus, as they often do not have their own cars or bikes, and there is a lack of public transportation in the rural areas, it is challenging for them to travel to the health centre.

In addition to the COVID-19 pandemic, over the past decades, the island of Borneo and its communities have undergone rapid and profound health, inequality and

environmental changes, which have significantly transformed Kalimantan (the Indonesian portion of Borneo), placing the Indigenous population, commonly referred to as Dayak (Haug, 2014, p. 358), in a vulnerable health situation. Deforestation and general degradation of the natural environment have affected the health of the Dayaks, who still live in and around the heart of Borneo's forests (Meijaard et al., 2013, p. 11). Over 10,000 Dayak people are now living with upper respiratory tract infection (URTI) from forest wildfires (Prima, 2019) and coal mining operations, as well as diabetes. The health issues also include women's health and childbearing (Colfer & Minarchek, 2013).

While there are ways to view health, this study follows the understanding of health based on the Constitution of the World Health Organization (WHO), which defines health as: "Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity" (WHO, 1948, p. 100; Schramme, 2023, p.201). In the context of this study, various factors affect the health of the Indigenous Dayak population, such as difficulties in accessing public health care and a lack of health information. In addition, it must be taken into account that Indigenous communities have their own specific knowledge and experience of using traditional Indigenous medicine to treat sickness at home for particular diseases (Anggerainy et al., 2017); hence, some of the Dayak people do not want to receive medical treatment from outside their communities. Some would prefer a hybrid combination of traditional and western style medicine. Indigenous views, perspectives, and voices are overlooked when addressing their health, even where they are supposed to be at the centre of the discussion. To address this challenge, this study uses a human-centred design (HCD) approach to promote health while accounting for the influence of cultural-Indigenous knowledge on Indigenous people's health.

Health is one of the key areas of inquiry within HCD and design studies research; previous studies have shown the potential of its use in the contexts of health outcomes. However, in Indonesia, there is still a lack of research within HCD regarding the influence

of cultural-Indigenous knowledge on design outcomes and the implications. In fact, in Indonesia, research on HCD and local people's health does not exist. This is despite the fact that previous researchers consistently argue that while trying to address local community health, it is critical to account for individuals' cultural background (Campbell et al., 1999; Kreuter & McClure, 2004). Thus, there is a call to pursue HCD research that intersects with the local traditional knowledge approach in this design scholarship area. Approaches to the local community culture should be culturally sensitive, using Indigenous approaches where appropriate (Bessarab & Ng'andu, 2010; Putt, 2013; Walker et al., 2014; Wilson, 2008).

The guiding argument of my work for this research is that, when designing for local people, it is essential to account for the way in which the views and voices of local people shape their own health, particularly when addressing and envisioning local health and its future in rural communities. In general, the goal of my doctoral research is to unpack this argument through the lens of an Indigenous standpoint (Foley, 2003; Nakata, 2007) by employing the concept of HCD guided by local knowledge.

1.2 Research Questions

This overarching question guides my research work: How might local approaches to health be considered alongside HCD approaches to design better local health systems for local communities via localised design intention, and what are the implications of doing so?

My thesis statement is that Indigenous approaches can be considered with human-centred design approaches through design intentions that facilitate local standpoints in sharing their vision of a healthy future. As a framing device in this study, design intentions reflect local visions and dreams as local people share their personal stories, experiences and knowledge for better local health.

RQ1: What are the circumstances emerging from the current designated health systems in local communities?

- How can these circumstances be analysed and understood from the Indigenous standpoint alongside HCD perspective?
- What health activities or programs exist in Dayak communities? Where can health information be accessed within the local community, if at all?
- What form does this design take, and does it adequately represent the Indigenous Dayak perspectives?

While Chapter 2 sets the direction to explore all research questions, including RQ1, Chapter 3 specifically responds to RQ1 by highlighting three case studies that explore the circumstances resulting from current designated health systems. These cases offer distinct yet complementary ways of illuminating local people's health in rural areas. Based on these case explorations, the notion of *kebersamaan* (togetherness) plays a pivotal role in navigating life under health systems and is central to the understanding of the local standpoint and human-centredness in this inquiry.

RQ2: Using Indigenous standpoint, how do Dayak communities engage in health practices in their daily lives?

- Where do they seek health information when exploring health alternatives beyond their communities?
- How do they perceive health promotion materials when receiving health information from healthcare workers outside their communities, and what factors should be considered when offering such support?
- How do they envision their future health and well-being?

Answering this research question helps me identify the role of the local approach in their health practices, their interest in receiving support, and their voices and views regarding how their community can be best supported in health.

Chapter 4 provides the answer to RQ2 by amplifying local voices from the perspectives of both Dayak people and health workers. Voices are narrated by applying the local term *pe' siu* (*bercerita/bakisahan* or sharing stories). This local term respectfully

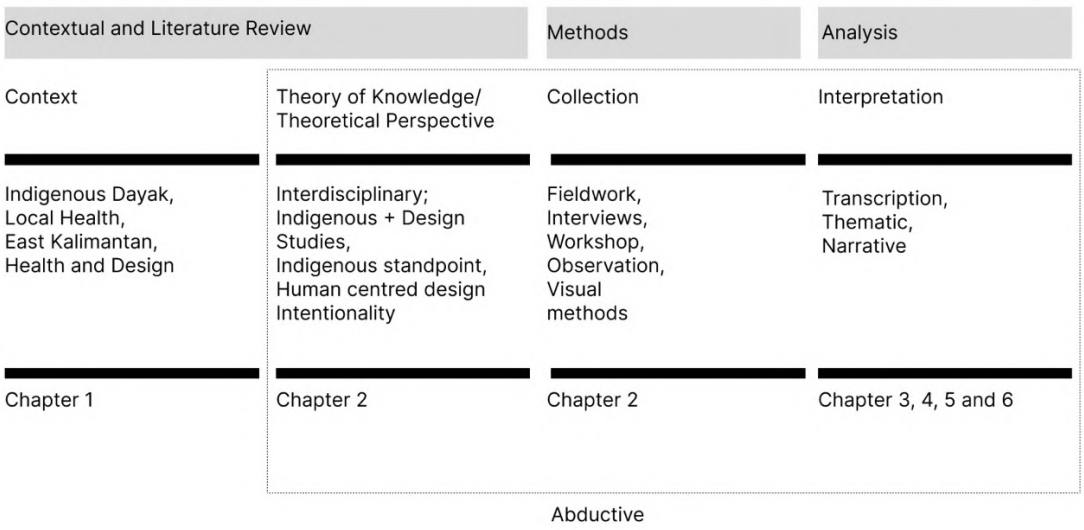
captures local stories, positioning these narratives as local knowledge. The interpretation of these voices is then situated within broader health systems design to enable the repositioning of local people at the centre of health systems.

RQ3: How is the HCD approach connected into local traditional knowledge and its local storytelling approaches through participatory design activity with the local community members in envisioning the future? To answer RQ3, using the design workshop and its activities, I explore the HCD approach to the local standpoint among Dayak communities. Chapter 5 and part of Chapter 6 respond to this question. Chapter 5 details the design workshop as a platform to explore the consideration of the Indigenous standpoint alongside human-centred design in designing local health systems. Chapter 6 elaborates on the rendering of local voices and research approaches in the exploration of designing local health systems, proposing the notion of localised design intention as a way to reorient local voices as central to design knowledge, intent, and guidelines to establish foundations for designing better health systems.

1.3 Theoretical and Methodological Overview

I answer the questions above by unpacking them through the lens of Indigenous standpoint (Foley, 2003; Nakata, 2007; Smith, 1999, 2005) and HCD perspectives (Buchanan, 2001; Giacomin, 2014; Krippendorff, 2004, 2005) (*see* Chapter 2; *see* Table 1 for my study journey overview). These approaches advocate accounting for people's cultural backgrounds and conducting culturally sensitive interpretative research. I have performed a qualitative fieldwork study that provides a way of looking and a way of listening to local people's voices (Wolcott, 1999). This was done by conducting fieldwork doing data collection via a set of methods such as observation, semi-structured interviews, a design workshop, and visual methods. I have also collected and analysed locally distributed examples of public health communication.

Table 1 Research overview of the intersection between methods, modes of analysis and thesis structure.



In conducting fieldwork, I resided in the Indigenous Dayak Long Lanuk village located in East Kalimantan, Indonesia, from January to July 2023. During this time, I actively observed and engaged in various aspects of village life, including public health meetings, social and cultural events, and public health visits organised by the local government. This immersive observation process greatly contributed to my comprehension of the health-related challenges confronting the local population and how these issues are communicated and discussed within the community.

I have conducted a total of 15 interviews for this research project, comprising nine interviews with Dayak individuals and six with local health workers. Generally, my interview questions revolved around topics related to local knowledge, local health, health design, and health services. Initially, I had proposed conducting 20 interviews for this study, as recommended by (Creswell, 1998). However, due to pragmatic considerations, including constraints related to resources such as time, budget, and access to the research site, as well as the richness of the interviews, I adjusted the number of interviews. As Malterud et al. (2016) suggested, the sample size can be reduced when it provides sufficient information power, and vice versa.

My design workshop aimed to facilitate the sharing of stories and the envisioning of local health among members of the local community. I structured the workshop activities around the creation of journey maps for personas that integrated the visions and stories shared during the workshop. This workshop took place at the Sub-Community Health Centre in the Dayak Long Lanuk village and involved eight local participants. In general, workshops tend to be small, typically accommodating from six to 15 participants, which allows for personalised attention, engagement in activities, and an opportunity for everyone to voice their thoughts (J. Schultz et al., 2008). For this study, my workshop's sample size was guided by insights from previous studies published in *CoDesign* journal and *Design for Health* journal (Dickson et al., 2017; Huang et al., 2018; Rose & Bingley, 2017; Villalba et al., 2021). Previous design workshops, such as Dickson et al.'s (2017) with seven participants, Rose & Bingley's (2017) involving nine participants, Huang et al.'s (2018) with nine workshop participants, and Villaba et al.'s (2021) workshop with six participants, informed the selection of this workshop's sample size.

1.4 Research Context

This study is situated within the Indonesian context, focusing on health services, the design of the communication of these services, and the Indigenous Dayak community in the country. Below, I elaborate on the overview of the research context.

1.4.1 Overview of health systems and services in Indonesia

The origins of Indonesia's healthcare sector are rooted in the non-profit private sector during the Dutch colonial period. Schoute notes that the first modern healthcare facilities in Indonesia were established during the colonial period, with the Dutch East India Company founding a hospital in Batavia in 1626 (1938). Initially, these facilities primarily served the army, civil servants, and workers from major colonial enterprises (Boomgaard, 1993). With little to no government-led health initiatives, Dutch Christian missionaries (*zending*) began setting up hospitals aimed at serving the poor in the late 19th century. Subsequently, various Catholic orders in the early 20th century, followed by

the Islamic group Muhammadiyah in 1923, and Jang Seng, a pioneering group of Indonesian Chinese doctors in 1925, also started establishing hospitals. Many of these private institutions, which often provided charitable care to needy patients, were subsidised by the colonial government. Trisnantoro et al. observe that during the economic downturn of 1930, private hospitals began accepting self-paying patients to boost their income, although these payments made up only a small portion of their total revenue (2012).

Following independence in 1945, the Indonesian government embarked on establishing a public service sector, including taking over certain private hospitals to shift from a predominantly private healthcare system to one with a stronger public focus. However, during the immediate post-independence period, the government faced significant challenges in providing healthcare subsidies, leading to considerable resource shortages for public hospitals and healthcare services, as noted by Trisnantoro et al. (2012).These shortages impacted the effectiveness and reach of the healthcare system during its nascent stage of development under the new governmental structure.

Between 1945 and 1950, the Indonesian healthcare system was predominantly focused on curative programs, targeting key demographic groups such as adults, mothers, and infants and reflecting the healthcare needs and demographic profile of the population at the time. By 1950, Indonesia, with a population of approximately 72 million, was significantly underserved in terms of medical professionals, having just 1,200 medical doctors. The healthcare challenges were stark, as evidenced by the infant mortality rate, which stood at a distressing 200 per 1,000 live births, and life expectancy was only about 48 years, highlighting the urgent need for enhanced healthcare interventions (Kristiansen & Santoso, 2006). In this context, traditional healers known locally as *dukun* and traditional medicine were integral to the community's healthcare, serving as the primary health resource for many, especially in rural areas where modern healthcare services were limited or non-existent. These traditional practices played a critical role in the health

system of Indonesia, filling the gaps left by the scarcity of formal medical resources and services (Kristiansen & Santoso, 2006).

In the early 1950s, following the Bandung Plan, which was spearheaded by Health Minister Johannes Leimena to extend preventive healthcare services to rural areas, the government initiated an integrated healthcare program that encompassed both preventive and curative care. This initiative led to the establishment of also known as community health centres, at the district level, each equipped with medical doctors, nurses, and midwives (Heywood & Choi, 2010). Despite these efforts, the realisation of the goal to have one Puskesmas for every subdistrict was impeded by slow economic growth and political turmoil, and it wasn't until 1968 that this objective was met. The overarching aim was to have one Puskesmas catering to approximately 30,000 people, alongside the establishment of Puskesmas Pembantu (Pustu), or subcommunity health centres, in each village, with a coverage target of around 3,000 individuals. However, it wasn't until 1988 that the full coverage of this comprehensive healthcare system was finally achieved (Kristiansen & Santoso, 2006).

During President Suharto's centralised government tenure, Indonesia witnessed substantial improvements in its healthcare infrastructure, particularly from the 1970s to the 1980s. This period witnessed the establishment of district hospitals and subdistrict community health centres across the nation, accompanied by a notable reduction in infant mortality rates and an increase in life expectancy (Kristiansen & Santoso, 2006). However, the Asian economic crisis in 1997 plunged Indonesia into economic hardship, with an estimated 80 million Indonesians falling below the poverty line defined by the World Bank (Shields & Hartati, 2003). Following the fall of Suharto's regime in 1998, prompted by extensive corruption and a lack of transparency (Kristiansen & Santoso, 2006), the country held its first democratic election. In 2001, the government introduced decentralisation, granting provincial and district governments the authority to deliver services to the community, including healthcare (Abdullah et al., 2012; Heywood & Choi,

2010). This decentralisation streamlined administrative processes, resulting in more efficient public services (Kristiansen & Santoso, 2006). However, these recent developments also underscore the increasing significance of social welfare issues and the growing demand for assistance for both the impoverished and the entire citizenry; these have become the driving forces in healthcare policy.

The overview provided above offers insights into Indonesia's healthcare system, which faces the monumental task of serving a population exceeding 270 million. it necessarily simplifies the intricate web of challenges, initiatives, and reforms characterising Indonesia's healthcare landscape. With a diverse population spread across vast geographical regions, Indonesia grapples with multifaceted issues ranging from resource allocation and accessibility to cultural and socioeconomic disparities. Despite concerted efforts to improve healthcare infrastructure and service delivery, significant disparities persist between urban and rural areas, as well as among different socioeconomic groups. The evolution of Indonesia's healthcare system reflects a complex interplay of historical legacies, political dynamics, and socioeconomic factors. Moreover, ongoing reforms, such as decentralisation and efforts to address poverty and inequality, underscore the dynamic nature of Indonesia's healthcare policy and the ongoing quest to ensure equitable access to quality healthcare for all its citizens. These insights serve as a starting point for deeper exploration into the complexities and challenges inherent in Indonesia's healthcare system.

1.4.2 Design for health in Indonesia

The interrelation of health and design, while an ancient practice, has only recently been formalised in academic and professional domains. Historical records show that as early as 1510, Leonardo da Vinci utilised anatomical drawings to probe deeper into human biology, thus pioneering the integration of artful design and scientific study (Lab4Living, 2015). This early melding of disciplines highlights the longstanding utility of design in enhancing and expanding medical knowledge. However, the contemporary

formalisation of this interdisciplinary field began much later. The significant milestone in this regard was the inaugural academic conference on design and health, held in 2011 at Sheffield Hallam University, UK. This event marked a pivotal moment in acknowledging the importance of design principles in the context of health and well-being and set the stage for the establishment of dedicated platforms for dialogue, development, and dissemination of research in this field.

Building on the momentum of this conference, the field of design and health saw further institutionalisation with the launch of the *Design for Health* journal in 2017 in Rome, published by Taylor & Francis. This publication serves as a crucial repository for scholarly work at the nexus of design and health, covering a broad spectrum of topics from theoretical frameworks to practical applications (Chamberlain, 2017; *Design for Health*, 2017; Lab4Living, 2015). The journal emphasises the dissemination of work that is not only academically rigorous but also rich in practical relevance, reflecting a diverse range of perspectives that contribute to a holistic understanding of health within the design context. This focus on comprehensive and inclusive research helps bridge the gap between abstract design concepts and their tangible impacts on health outcomes, facilitating the development of solutions that are both innovative and efficacious. The evolution of this field continues to unfold as researchers and practitioners worldwide contribute to the expanding landscape of design in health, increasingly recognised as essential to advancing public health and individual well-being.

Moreover, the integration of design and health studies within the curriculum of prominent design schools marks a significant evolution in contemporary design education and research as well. Several leading institutions globally have begun to specialise in this intersection, recognising the profound impact that design can have on health outcomes. For example, the University of Technology Auckland (AUT) not only incorporates a research and practice studio dedicated to health-related design but also offers a minor specialisation in this burgeoning field (AUT, 2022; Goodhealthdesign, 2019). This

development highlights a strategic emphasis on cultivating a nuanced understanding of how design can influence health at various scales, from individual medical devices to systemic healthcare solutions. Similarly, the Royal College of Art (RCA) in the UK has developed a comprehensive degree program focused on health and design, which integrates medical sciences and design thinking to innovate healthcare solutions that are both practical and patient-centric (Healthcare & Design, 2021).

In the United States, the College of Design at the University of Minnesota provides a robust platform for advancing this discipline through its Design for Health centre (DesignUMN, 2021). This centre serves as a hub for interdisciplinary research and education that bridges health sciences and environmental design. Likewise, Stanford University's Design School offers classes that not only focus on health-related design but also emphasise the importance of co-design and technological innovation in creating impactful health solutions (DSchool, 2023). These programs collectively signify a growing trend towards incorporating health considerations into design education, equipping future designers with the skills and knowledge necessary to tackle health challenges through innovative design practices and research. However, this focus is not universally adopted, with countries like Indonesia showing a notable gap in both research and educational programs dedicated to design for health. This absence indicates a significant disparity in the global distribution of educational innovations related to health and design, suggesting a need for a broader adoption and adaptation of such specialised studies, especially in regions where healthcare challenges are most acute.

In Indonesia, most intersections of design and health are situated within the framework of "health promotion", leveraging visual communication to convey health-related messages to broad audiences. Within the context of health in Indonesia, the Ministry of Health provides the following definition of health promotion:

> *Promosi kesehatan adalah upaya untuk meningkatkan kemampuan masyarakat melalui pembelajaran dan, oleh, untuk, dan bersama masyarakat, agar mereka dapat menolong diri sendiri, serta mengembangkan kegiatan yang bersumber daya*

> *masyarakat, sesuai dengan kondisi sosial budaya setempat dan didukung kebijakan publik yang berwawasan kesehatan*. (Indonesian Ministry of Health, 2013, p. 4) Translation: Health promotion is an endeavour aimed at enhancing the community's capacity through learning, and it involves active participation by, for, and with the community. Its purpose is to empower individuals to help themselves and to foster the development of community-based initiatives that align with local socio-cultural contexts. This approach is further bolstered by health-oriented public policies.

Based on that description, the synergy between design and health predominantly revolves around the concept of health promotion, a strategy that extensively utilises visual communication tools to disseminate health-related information effectively across a diverse audience. The Indonesian Ministry of Health articulates health promotion as an initiative to augment the community's capability through educational means that encourage active participation and self-help among community members (Indonesian Ministry of Health, 2013). This method is designed to empower individuals and promote community-led health initiatives that are not only sustainable but also culturally pertinent. The use of design in this context, therefore, focuses on creating visual aids and communication strategies that can overcome language and literacy barriers, thus enhancing the accessibility and understanding of health messages. The strategic use of infographics, posters, public service announcements, and digital campaigns are examples of how design principles are applied to facilitate complex medical communications and public health advisories. When these design efforts are aligned with local socio-cultural norms and values, they become more than mere information dissemination tools; they are transformed into effective instruments for community mobilisation and behavioural change.

Adapting health promotion strategies to the vast socio-cultural landscape of Indonesia is paramount due to its diverse ethnic mosaic where each region is adorned with distinct traditions and languages. This diversity presents significant challenges in the contextualisation of health-related design, particularly because the prevailing health

promotion model in Indonesia is centralised and tends to reflect urban-centric norms which do not necessarily resonate across the varied local contexts found throughout the archipelago. The centralised model often overlooks the nuanced cultural cues and local idioms of health that are pivotal in making health promotion interventions successful in rural and remote areas. Consequently, there is a pressing need for a decentralised approach in the design of health promotion media that appreciates and integrates local cultural specifics. Without such sensitivity to local contexts, health messages may not only fail to engage their intended audiences but can also lead to misunderstandings and poor health outcomes, exacerbating local health disparities (Yulius, 2016).

The lack of comprehensive research at the intersection of design and health further compounds these challenges, creating a rift between potential effective design practices and their implementation within health services. Prior studies, such as those by Yulius (Yulius, 2016), have critiqued the ineffectiveness of most health-related design outputs in Indonesia, which frequently fail to align design principles with the intended health messages, thus undermining the efficacy of these campaigns. This misalignment is not just a matter of aesthetic inadequacy but also reflects a deeper failure to attend to relevance and contextual appropriateness. These issues add complexity to the local health problems in Indonesia, including those faced by Indigenous Dayak, elaborated in the next section.

1.4.3 Indigenous Dayak

In Indonesia, the concept of Indigeneity differs substantially from definitions typically used in countries like Australia, New Zealand, or Canada, where the term explicitly refers to distinct ethnic groups with long histories of marginalisation and colonial disruption. Indonesia's unique socio-cultural landscape, featuring over a thousand ethnic groups and more than 700 regional languages, renders the concept of Indigeneity ubiquitous rather than exclusive. This broad spectrum of ethnic diversity is encapsulated in Indonesia’s foundational motto inscribed on the national emblem, “*Bhinneka Tunggal*

Ika", which translates to "Unity in Diversity" (Indonesia: *Meskipun Berbeda-beda tetap satu jua*). This phrase not only celebrates the rich mosaic of cultural identities within the nation but also emphasises a collective identity that harmonises these diverse elements under a national narrative. The term Indigenous is thus contextually fluid in Indonesia, often used to describe local or native populations specific to a particular region, such as the Dayak, Banjar, Balinese, Papuan, Manado, or Batak peoples. Each group, while inherently Indonesian, retains distinct linguistic, cultural, and social practices that are recognised and respected within the wider framework of national unity.

To extend further the discussion on Indigeneity, I briefly overview the neighbouring country: Malaysia. The concepts of *Bumiputra* (native Malaysians) in Malaysia and *Pribumi* (native Indonesians) in Indonesia reflect divergent understandings of Indigeneity shaped by distinct colonial histories, cultural dynamics, and governance frameworks. In both countries, these terms were used to distinguish between Indigenous and non-Indigenous populations, often in response to the economic dominance of immigrant groups such as the Chinese. However, the colonial experiences in the two regions were markedly different, influencing the post-independence application of these concepts. In Malaysia, British colonial policies led to the creation of a plural society where the Malays, though the Indigenous majority, were economically marginalised, resulting in the institutionalisation of Bumiputra status post-independence (Wylde, 2017). The policy aimed to correct economic imbalances by granting Malays and other Indigenous groups special rights, such as affirmative action in education, housing, and employment, as part of a broader nation-building strategy (Siddique & Suryadinata, 1981). This created a clear legal distinction between Bumiputra and non-Bumiputra (often of Chinese or Indian descent), which was enshrined in the 1957 Constitution and continues to define Malaysian governance (Mariappan, 2002).

In contrast, Indonesia's colonial history under Dutch rule fostered a different demographic and political landscape. The term Pribumi, while also signifying Indigenous identity, became more central to Indonesia’s post-independence nationalist rhetoric. Following the departure of the Dutch, the concept of Pribumi was used to promote Indigenous economic power, particularly through policies like the Politik Asli (Indigenous policy), which restricted the economic activities of non-Indigenous groups, especially the Chinese (Chen, 2022). Unlike Malaysia, Indonesia did not formally institutionalise special privileges for Pribumi populations through the constitution but relied more on economic policies aimed at redressing imbalances between ethnic groups. While Bumiputra in Malaysia is often linked to political representation and privileges, Pribumi in Indonesia reflects a more economic and ethnic-nationalist framework, where Indigenous status is more fluid and historically tied to the political exclusion of the Chinese and other non-Indigenous minorities (Siddique & Suryadinata, 1981). This difference in focus, Malaysia's emphasis on political integration through legal rights versus Indonesia's economic and social integration, illustrates the varied interpretations of Indigeneity in Southeast Asia, shaped by the legacies of colonialism and the different paths each nation took after independence.

The nuanced application of the term Indigenous in Indonesia underscores a broader, more inclusive approach to recognising the country’s ethnic diversity as compared to the often politically and historically charged definitions found in other post-colonial contexts. This inclusive categorisation promotes a model of national identity that, rather than prioritising certain groups as “more Indigenous” than others, embraces an egalitarian view of indigeneity. Consequently, this approach allows for a more flexible interpretation of Indigenous rights and cultural preservation that is adapted to the local context of each ethnic group. For instance, in regions like Papua or Kalimantan, where distinct Indigenous populations such as the Dayak or Papuan peoples reside, local definitions of Indigeneity can play a crucial role in the advocacy for and implementation of

policies regarding land rights, cultural heritage, and political autonomy (Acciaioli, 2001; Kingsbury, 2004). However, the challenge remains: to ensure that this diverse understanding of Indigeneity does not dilute the focus needed to address specific socio-economic and political issues facing particular groups, especially in areas where commercial interests threaten traditional lands. The balance between celebrating a unified national identity and addressing the unique needs of individual ethnic groups is a continuing challenge for Indonesia, reflective of its complex interplay between national unity and regional diversity.

This study was conducted in East Kalimantan, Indonesia, a region that has recently garnered significant attention due to its pivotal role in the country's ongoing developmental strategies, particularly since the announcement of Nusantara City. This new capital city is poised to replace Jakarta as the capital and is currently under construction in East Kalimantan (Hamdani, 2022). Chosen for its strategic location on Borneo, the third-largest island in the world, East Kalimantan offers an expansive territory characterised by low population density, which makes it an ideal candidate for accommodating the infrastructural and administrative needs of a burgeoning capital. As a province, East Kalimantan occupies the eastern segment of Borneo and is home to approximately 3.7 million people. With these demographic features, it is perceived as a suitable site for Nusantara City because it provides ample space for development while mitigating the typical challenges of overcrowding found in more densely populated urban areas.

East Kalimantan is a melting pot of various ethnic groups, each contributing to the rich cultural tapestry of the region. According to data from the Central Agency of Statistics Indonesia (*Badan Pusat Statistik* – BPS) reported in 2010 (BPS, 2010), the demographic landscape is predominantly composed of the Javanese, who constitute about one third of the population and are dispersed widely across nearly all areas of the province. Following them, the Bugis are the second largest ethnic faction, with their settlements primarily

concentrated along the coastal and urban zones, leveraging their historical maritime skills for economic activities. The Banjar people, originally native to South Kalimantan, represent the third largest group and exert considerable cultural influence within their communities. Lastly, the Dayak, who account for about ten percent of the local populace, predominantly reside in the secluded interior rainforests of East Kalimantan. These groups collectively exemplify the diverse human landscape of the region, each maintaining their distinct cultural heritage while coexisting within the broader societal framework of East Kalimantan.

Indigenous Dayak stands as one of the native ethnic groups inhabiting the diverse landscapes of Borneo (Kalimantan), as noted by various scholars (Sada et al., 2019; Sellato, 2002; Sillander & Alexander, 2016). Unlike many homogeneous linguistic communities, the Dayak people boast linguistic diversity, particularly evident in East Kalimantan, where they are bilingual, proficient in both Indonesian and their Indigenous Dayak tribal languages (Avé, 1972). Borneo Island itself hosts a rich tapestry of linguistic variation, with an estimated 170 languages and dialects spoken across its expanse. The languages of the Dayak Indigenous communities fall within the broader category of Malayo-Polynesian languages, as categorised by linguistic studies (Adelaar, 1995). This linguistic diversity not only reflects the cultural richness of the Dayak people but also underscores the complexity and depth of Borneo's Indigenous heritage, serving as a testament to the intricate interplay of history, culture, and linguistic evolution within the region.

The Dayak people, residing primarily in East Kalimantan as well as across Borneo, have preserved their rich history through a combination of oral traditions, wooden records known as *Papan Turai*, and various customary practices that are integral to their cultural identity (Mawar, 2006). Like many Indigenous groups globally, the Dayak possess a treasure trove of mythical oral epics that explore the origins and exploits of their ancestors. A quintessential example of such an epic is the “*Tetek Tahtum*” by the Ngaju

Dayak, a compelling narrative that recounts the celestial descent of their forebears who, having initially fallen from the heavens, migrated from the inland regions to the coastal areas of Borneo (Nahan & Rampai, 2010). This epic tale, rich in symbolic imagery and ancestral homage, continues to be a living tradition within the Ngaju Dayak communities. It is often passed down through generations not only as a story but also as a lullaby, typically accompanied by melodious strains of the *Kecapi*, a traditional lute-like musical instrument, thus weaving the historical with the personal in a tapestry of cultural continuity.

In addition to residing in villages, Dayak people also inhabit the hinterland areas, where they dwell in longhouses known as *Umaq Daru*. These longhouses serve as the communal abode for entire extended Dayak families, fostering a close-knit living arrangement where multiple generations coexist harmoniously (Helliwell, 1992). Moreover, in certain hinterland regions, it's customary for an entire Dayak clan to inhabit a single longhouse, further reinforcing the strong bonds within the community. To safeguard their homes and loved ones from malevolent forces believed to bring illness and misfortune, Dayak families often erect guardian statues in front of their longhouses, imbuing their dwellings with spiritual protection. Some Dayak villages also repurpose their longhouses as multifunctional spaces, transforming them into communal gathering places for various activities such as prayer sessions, community meetings, and cultural performances featuring traditional dance and music, thereby enriching the social fabric of Dayak society.

Moreover, it is worth noting that the Dayak people of East Kalimantan, like most Dayaks in the region, are renowned for their exquisite artistry in crafting beautiful cloth, ornaments, and patterns that encapsulate their rich historical and symbolic traditions. These people skillfully produce their own textiles, weaving them from specific plant fibres, a process integral to their cultural rituals. They also create intricate visual ornaments that adorn their traditional houses, enhancing their aesthetic and cultural value. Additionally, the Dayak communities in East Kalimantan are distinguished by their unique body art

practices, including tattoos and the tradition of elongating earlobes, which serve as significant cultural markers. Tattooing, a prevalent custom among both men and women across various Dayak groups in the area, involves elaborate designs featuring motifs of snakes, dragons, birds, and plants. Often these designs are amalgamated to convey deep symbolic meanings such as bravery, patience, and beauty, reflecting the profound spiritual and social beliefs of the Dayak people (Ariaini et al., 2007).

The above description provides a brief overview of the richness of Dayak cultures and traditions, which serves to set a general context for this research. This study specifically focuses on the Dayak communities residing in Long Lanuk, situated in Berau regency, East Kalimantan. This particular locale offers a unique perspective on the intricate social, cultural, and artistic practices that are emblematic of the Dayak people. By delving into the lives and traditions of the Dayaks in this distinct region, the research aims to uncover the nuanced ways in which these Indigenous groups maintain their cultural heritage and adapt to contemporary challenges. This exploration is not only pivotal for understanding the cultural dynamics of East Kalimantan's Dayak populations but also for appreciating the broader socio-cultural landscape within which these communities exist.

1.4.3.1 Long Lanuk

As previously highlighted, East Kalimantan represents a significant geographical and cultural segment of Indonesia, occupying the eastern part of Kalimantan Island. The administrative structure of this province is organised into seven regencies, namely Paser, Penajam Paser Utara, Kutai Barat, Kutai Kartanegera, Mahakam Ulu, Kutai Timur, and Berau, each with its unique sociocultural and environmental landscape. Among these, Berau regency is of particular interest for the scope of this thesis, especially the Dayak Long Lanuk village which falls under its jurisdiction. This focus on Berau regency and more specifically, the Dayak Long Lanuk village, provides a concentrated lens through which to examine the intricate weave of cultural, environmental, and social dynamics that characterise this part of East Kalimantan. It offers a rich field for exploring the interaction

between traditional practices and modern influences within the Dayak communities, providing insights into how these Indigenous people navigate the complexities of maintaining cultural identity in the face of rapid societal changes.

The Dayak Gaai tribe, residents of Long Lanuk, are Indigenous to tropical rainforest regions bordered by the majestic Nyapas mountains. Long Lanuk itself is positioned as the most remote settlement in the Sambaliung Village area, with its access via a rugged two-hour drive from the nearest district city centre. The journey is arduous, traversed on unpaved paths comprised of dirt or gravel, which underscores the village's isolation. This geographical seclusion presents significant logistical challenges, not least in the provision of basic services and economic opportunities. The Dayak community here, deeply rooted in their environment, has developed a lifestyle that is inextricably linked with the land they inhabit. However, this connection also exposes them to unique challenges, particularly in the context of global environmental changes that threaten their traditional way of life and the sustainability of their natural

The onset of the COVID-19 pandemic has further intensified the existing challenges faced by the Dayak people in Long Lanuk, amplifying health and social issues to critical levels. Like many Indigenous populations around the world, the Dayak Gaai tribe has experienced the pandemic not just as a health crisis but as a cultural catastrophe. The virus has swept through communities, disproportionately affecting the elderly—the very custodians of Dayak folklore, languages, and spiritual practices. The loss of these elders has ruptured the continuity of intergenerational dialogue, erasing irreplaceable cultural knowledge and weakening the community's cultural identity. Moreover, the pandemic has starkly highlighted the inadequacies in healthcare access among indigenous communities, exacerbating disparities and exposing them to greater risks. Discrimination and neglect have surfaced with renewed urgency, demanding a reconsideration of how Indigenous well-being is integrated into national health policies. This crisis has brutally underscored the need for a robust, culturally sensitive health

framework that respects and incorporates traditional knowledge and practices, ensuring that these communities do not just survive but thrive.

In general, the Dayak communities in Berau are currently facing a dual threat that profoundly influences their future prospects and daily realities. On one side, the pervasive impact of the COVID-19 pandemic has disrupted their societal norms and health systems, and on the other, aggressive coal mining operations pose a severe risk to their environmental and physical well-being. The Dayak villages are alarmingly proximate to these mining sites, merely two miles away, placing them within the direct impact zone of the environmental degradation that accompanies such activities. This proximity to coal mining operations, a longstanding issue, has entrenched itself within the landscape that surrounds Dayak lands. The looming possibility of these operations ceasing in the foreseeable future contributes additional layers of uncertainty. This complex interplay between an immediate health crisis and the chronic environmental stress caused by mining activities encapsulates the critical challenges faced by the Dayak community, compelling them to navigate through compounded hardships.

Within this fraught environment, the Dayak people of Berau are challenged to envisage a future that intertwines hope with survival, particularly when their perspectives and voices are marginalised. The cessation of mining could mark a new beginning when they can reclaim and rehabilitate their lands, but this is mired in ambiguities over environmental recovery and the socio-economic restructuring it necessitates. The pandemic, meanwhile, has foregrounded the critical need for accessible, robust healthcare systems that are attuned to the cultural and geographical specifics of Indigenous communities. The Dayak's resilience is tested as they seek pathways to sustain not only their health and environmental conditions but also their cultural heritage and identity in the face of such overwhelming odds.

Figure 1 Operational mining excavation pits not far from local river, homes and villages in East Kalimantan. This view is clearly visible from the airplane window when the aircraft is about to land or take off.
The photo was taken in January 2023.

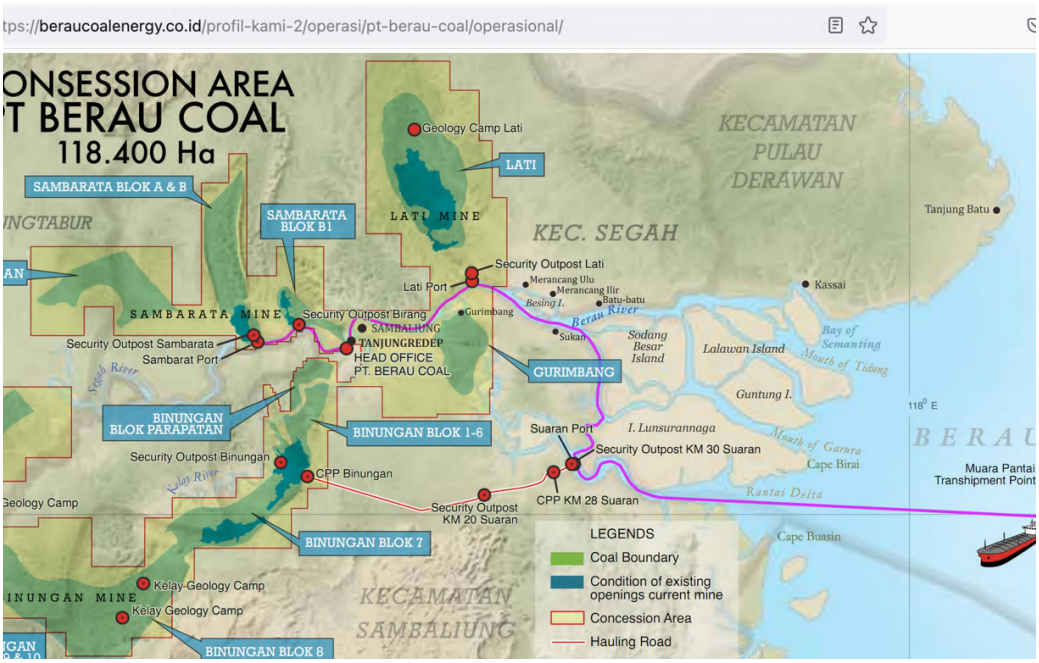


Figure 2 Map of the coal mining concession area operated by PT Berau Coal in Berau Regency, East Kalimantan.
Berau Coal is one of the top five mining companies in Indonesia. Screenshot taken on 16 June 2024 fr

Figure 3 Long Lanuk location (red circle) on Google Maps.
Google Maps Screenshot on 8 March 2023.

1.4.3.2 Picturing Long Lanuk

The discipline of design, particularly in visual communication, inherently intertwines with the use of text and images to convey messages effectively. However, in the context of ethnographic studies, such as those involving the Indigenous Dayak communities of East Kalimantan, mere textual descriptions often fall short of capturing the nuanced realities of the subjects under study. Therefore, extending the narrative to include visual elements becomes not only beneficial but essential. This extension aligns with Susan Sontag's perspective on photography, where she describes photographs as "memento mori" that articulate the transience and vulnerability of their subjects (Sontag, 1973). In this study, the decision to explore Long Lanuk through photography is particularly poignant, as it aims to encapsulate the ephemeral moments of Dayak life and their environmental interactions. This method of representation goes beyond mere visual documentation; it seeks to engage with the deeper layers of human experience, capturing the mutable nature of life and the inevitable progression of time. Photographs, in this context, are not just static images but dynamic narratives that offer insights into the lives of the Dayak people, reflecting their traditions, cultures, and the changing landscapes they inhabit.

The choice of photography as a medium to explore and document Indigenous life in Long Lanuk is informed by the desire to provide a more immersive and empathetic understanding of the community's interaction with their environment. This approach is particularly significant in the study of ethnographic contexts, where the subtleties of social and environmental relations are best expressed visually. The photographs serve as a bridge connecting the viewer to the remote realities of the Dayak, potentially fostering a greater appreciation and respect for their cultural practices and the ecological challenges they face. As Sontag suggests, by freezing moments of Dayak life, the photographs not only bear witness to these moments but also challenge observers to reflect on the issues of mortality, vulnerability, and change within these communities (Sontag, 1973).

Consequently, this visual method enhances the textual narrative, providing a layered understanding that text alone could not achieve. It enriches the viewer's perception, making the distant social and cultural phenomena accessible and relatable, thereby fulfilling the critical role of design in transcultural, health and environmental research.

Through the framing of the photograph (Figure 4), Long Lanuk presents itself as a serene, picturesque, and verdant village, nestled amidst lush forests. However, when viewed from a wider perspective, as shown in photos that I took from the airplane (Figure 1) and in Google Images (Figure 3), Long Lanuk is in close proximity to an open-pit coal mine excavation site within a coal mining concession area in Berau regency (Figure 2). The dust generated by mining operations has emerged as an adversary for the village's residents, leading to respiratory issues (ISPA), as occasionally reported by regional media (Prima, 2019), albeit infrequently. Furthermore, upon a closer look, when zooming in on the interior regions of Indonesia, it becomes evident that this village is susceptible to the menace of malaria (Figure 5), and the current living conditions often result in a range of health problems, particularly affecting children (Figure 6). Additionally, Long Lanuk is vulnerable to flooding due to deforestation caused by coal mining and palm oil operations. Flooding in the village is captured in Figure 7 and Figure 8.

The Dayak Gaai community in Long Lanuk, a subset of the broader Dayak ethnic group, holds dance as a central pillar of their cultural expression and communal practices, as vividly depicted in Figure 9, where villagers are shown preparing for a performance at a local festival. Dance not only serves as a form of artistic expression but also plays a crucial role in the fabric of Dayak society, being an integral part of virtually every significant community event. Traditional gatherings, whether they are to celebrate the harvest, a wedding, the birth of a child, or other communal milestones, are invariably accompanied by dance performances (Figure 10). These dances are more than just entertainment; they are a rich form of cultural storytelling and heritage preservation, reflecting the community's beliefs, histories, and aspirations. Each movement and

sequence is imbued with symbolic meanings and functions, designed to communicate with spiritual entities, celebrate life's cycles, and fortify social bonds within the tribe.

Among these dances, the Hudoq dance, as illustrated in Figure 11, stands out for its distinctive cultural significance and the believed supernatural efficacy it holds over agricultural success. Performed during key agricultural festivals, the Hudoq dance is not only a spectacle of vibrant costumes and energetic movements, but also a ritualistic plea for divine favour. The dancers, adorned in elaborate masks and garbs that represent various spiritual entities, enact a narrative that is central to Dayak agricultural myths. The Dayak people of Long Lanuk believe that the dance has the power to protect their crops from pests and diseases, thereby securing a prosperous harvest. This belief in the magical properties of the Hudoq dance's movements, which are thought to influence soil fertility and enhance crop production, underscores the profound connection the Dayak people maintain with their environment. Through these ritual performances, the community not only seeks to sustain its food resources but also to strengthen the communal and spiritual ties that bind them, showcasing a holistic approach to life that integrates cultural heritage with environmental stewardship.

The Bajiak dance, a cherished tradition among the Dayak Ga'ai of Long Lanuk, serves as a vibrant expression of communal life and cultural identity, vividly captured in Figure 12. Characterised by its participants forming a lively circle and moving rhythmically to the beats of drums and gongs, the dance is a focal point of village festivities. Its appeal lies in the intricate footwork that dancers execute, paired sparingly with hand movements that are meticulously synchronised with the pulsating drum and gong music. The Jiak dance, a variant within the Bajiak tradition, is particularly noted for its four distinct foot movements and stamps, each uniquely aligned to varying drum beats. These steps are not only a visual spectacle but are also designed to be straightforward enough for all villagers to participate in, regardless of their dancing skill levels. Occasionally, the Jiak dance takes a more subdued form, performed without the accompaniment of instruments

but accompanied by the collective singing of participants. This version fosters a different kind of intimacy, typically featuring a mix of older women and young people dancing at communal gatherings that stretch into the wee hours of the morning.

The communal aspect of the Jiak dance is further enriched by the traditional Dayak beverages that are often shared among participants, enhancing the dance's role as a social nucleus in village life. During such events, the entire community comes together, blurring generational lines through the shared joy of dance and song. This inclusive atmosphere is not just about entertainment but also about reinforcing social bonds and providing a platform for everyone to engage and interact—qualities that became particularly significant to me during my stay in Long Lanuk. The dance nights became a vital social event where I found myself woven into the fabric of the community. Through the rhythmic foot stomping that resonated across the forest and the melodic cadences of collective singing, I was able to connect with the people of Long Lanuk in a profound way. The Jiak dance, thus, was more than just a cultural performance; it was a gateway to understanding the communal spirit of the Dayak Ga'ai, offering insights into their social dynamics and the pivotal role that traditional arts play in maintaining and celebrating their cultural heritage.

Access to Long Lanuk, a remote village nestled in the diverse landscapes of East Kalimantan, can be undertaken via both land and water routes (Figure 13), though neither path is straightforward, due to the absence of conventional public transportation systems such as buses or trains. The villagers, therefore, commonly resort to “hitching” rides—a practice deeply ingrained in their daily commute—if they do not own personal vehicles. The most typical personal vehicles in use are motorcycles and *Ketinting* boats, the latter being especially prevalent among those navigating the waterways. Travelling to Long Lanuk is not merely a commute but an exploratory expedition that cuts through the heart of Kalimantan's changing environmental and economic landscape. This journey offers unvarnished glimpses into the region’s industrial activities (Figure 14, Figure 15 and

Figure 16); coal mines buzz with relentless activity, vast coal transportation networks dissect the terrain, and expansive stretches of palm oil plantations unfold as far as the eye can see, laying bare the economic pursuits that dominate this part of Indonesia.

The route to Long Lanuk also exposes the environmental consequences of such industrial activities, most notably the disposal of mine waste, which is a common sight along the public roads and severely impacts the local ecosystem. Figure 17 and Figure 18 capture these troubling visuals, where heaps of waste from the mines are indiscriminately piled near living areas, posing health and safety risks to the local populations and wreaking havoc on the natural biodiversity. This stark visual commentary highlights the pressing challenges faced by the communities living in proximity to resource extraction operations. The contrast between the natural beauty of the region and the scarred landscapes left by economic exploitation forms a poignant backdrop to the daily lives of the villagers, underscoring the complex interplay between development and environmental stewardship. This journey, while illuminating the resilience and adaptability of the local communities, also serves as a reminder of the urgent need for sustainable health and environmental practices that protect both the livelihoods and the rich ecological tapestry of Kalimantan.

I discuss how my position and identity influence my analysis and presentation in this study in the positionality (Section 1.5). Although I haven't lived in Long Lanuk for an extended period, I capture their way of life in my writing and photography, highlighting the vulnerabilities of the people I encountered. I assert that I am a part of the local community, and thus, I expose my own vulnerabilities, as I have shared many common experiences in the village. I refrain from characterising my time in the village as either “easy” or “hard”. Instead, I aim to convey that it represents our shared daily existence. During my stay, I resided in a wooden house with plank walls, a tin roof, and no ceiling (Figure 19 & Figure

20). In this house, I used a *kelambu*[1] to protect myself from mosquitoes. All of these are part of the fieldwork where I captured and preserved moments through the lens of my digital camera.

[1] Mosquito net

Figure 4 Indigenous Dayak Long Lanuk Village as seen from a hill near the village.
The photo was taken on 25 March 2023.

Figure 5 Fogging activity (Pengasapan) to combat mosquitoes.
The photo was taken on 20 March 2023 with a mobile phone camera

Figure 6 Health visit to a villager's house to check on a toddler's condition due to colds and coughs. Some local people blame the mining dust for affecting their children's health. The photo was taken on 27 May 2023 with a mobile phone camera.

Figure 7 Village entrance during flooding.
The photo was taken on 8 May 2023.

Figure 8 My neighbor playing during the flood. I took this photo from my window. The photo was taken on 8 May 2023.

Figure 9 Indigenous Dayak people of Long Lanuk photographed before their dance performance.
The photo was taken on 16 February 2023.

Figure 10 Dance, traditional rituals on the water.
The photo was taken on 26 June 2023.

Figure 11 Hudoq dancers about to perform during a traditional event.
The photo was taken on 18 July 2023.

Figure 12 Local people perform the Bajiak dance all night long in a *Rumah Adat Dayak* (traditional Indigenous Dayak house).
The photo was taken on 22 March 2023 with a mobile phone camera

Figure 13 A local man driving a Ketinting.
The photo was taken on 27 July 2023

Figure 14 One of the road accesses to the village through a palm oil plantation.
The photo was taken on 25 April 2023.

Figure 15 Coal mining hole that can be seen from the public street.
The photo was taken on 28 April 2023.

Figure 16 Coal transportation in the district river.
The photo was taken on 4 February 2023.

Figure 17 Many water ponds can be found around community settlements and near public roads in this area. Some of the water ponds are artificial pools for collecting wastewater from mines, while some are mine excavation pits.
The photo was taken on 20 April 2023.

Figure 18 One of the many water bodies in this region resulting from former coal mining pits.
The photo was taken on 20 April 2023.

Figure 19 The house where I stayed in Long Lanuk.
The photo was taken on 1 February 2023.

Figure 20 Hanging my clothes in the house I stayed in during field work.
The photo was taken on 12 February 2023.

1.5 Positionality

1.5.1 On researcher background

The assertion that research can be conducted in an unbiased or impartial manner often overlooks the profound influence of the researcher's context and background on the production of knowledge. Sociologist Ramón Grosfoguel (2013, p. 76) critiques the notion of detached objectivity in research, arguing that knowledge is deeply embedded within its socio-cultural and environmental contexts. This perspective is complemented by feminist scholar Donna Haraway's criticism of 'the god-trick', a metaphor she uses to describe the fallacy of viewing the world from a disembodied, all-seeing perspective that falsely implies impartiality (Haraway, 1988). Further, Kimberlé Crenshaw's concept of intersectionality emphasises the necessity of recognising the specific standpoints from which individuals analyse and interpret their world (Crenshaw, 1990, p. 1244, note 8). This research acknowledges the lens through which it is conducted, shaped by my intersecting identities and experiences. As someone who is not of Indigenous Dayak tribe descent, but shares the broader identity of being *Pribum*i or native Indonesian, my viewpoint is inherently influenced by a shared historical context of colonialism and cultural interactions. This nuanced understanding of identity and history is critical in framing the research, providing depth and context that inform the analysis.

My personal background further colours the research perspective: born and raised in the Sambaliung district of Berau regency, East Kalimantan, my life has been intertwined with the Dayak communities, albeit from a distinct ethnic lineage. My father, a Javanese who resettled in East Kalimantan in the 1960s, and my mother, a native of the Banjarese ethnic group, provided me with a cultural heritage that straddles multiple Indonesian ethnic narratives. This biographical context does not merely serve as background information; rather, it plays a fundamental role in shaping my research methodology and interpretation of findings. Living in proximity to Dayak villages and being part of a community that has experienced historical challenges similar to those of the Dayak

people, such as colonialism, offers a unique, albeit not impartial, lens through which to conduct this study. The acknowledgement of this personal and cultural proximity is crucial, not only for transparency, but also for understanding the influence it may have on the research process and outcomes. It underscores the importance of reflecting on how personal histories and societal structures influence scholarly inquiry, particularly in studies related to Indigenous and cultural topics.

Despite my father being Javanese, my upbringing was deeply rooted in Banjarese traditions. In my childhood home, Banjarese was the first language I learned to speak, with Indonesian only coming later when I began my formal primary education. Moreover, the local practices of farming, hunting, and fishing prevalent in my village allowed me to engage closely with the Dayak people, who are renowned for their adeptness in similar subsistence activities. These interactions extended to other ethnic groups in the region I lived in as a child, including the Bugis and Urang Banua, who enriched my early experiences with a diverse tapestry of cultural traditions and communal relationships grounded in shared local practices.

In this research, I assume multiple roles simultaneously: a local design educator, designer, and researcher who is attracted to the Indigenous approach to the discipline of design in a given context (Indigenous health). The topic of interest for this research grew in part from my interest in the struggle of the Indigenous Dayak people who currently face environmental, health, and social changes such as deforestation, industrialisation, coal mining concessions, and COVID pandemic uncertainty, all major problems.

My high school dream was simple; to go to college in a city in Java where all the biggest and best Indonesian universities are. Later, I realised it was not so simple to go to college in Java if you were from the middle to lower class and living in *hutan* (forest); people in the city would say you were from an almost *unknown* public high school. I saw how my high school friends barely managed to attend a public accredited university in the capital city of Kalimantan, Samarinda.

After graduating from high school, I only sat for one test, the only opportunity for me to fulfill my high school dream. The test was conducted by a local government official in collaboration with the coal mining company that operated in my hometown. Five people who got the highest scores would get full scholarships to study in Java, including all related study allowances and a monthly stipend funded by the mining company. I was one of those five kids; there was also one Dayak kid, Eka Baya, who has become my longtime friend after everything that we have been through in college and after college.

I went back to my hometown after receiving my first degree in design from the Bandung Institute of Technology in West Java, Indonesia. As a fresh grad, with Eka Baya, I worked at the non-profit local foundation registered by the mining company, where we mostly visited Dayak villages to perform community educational training and taught part-time at local schools. I then joined the coal mining corporation that fully funded my first degree. I was a public relations officer handling two main areas: I was corporate representative for the corporation and local communities (as I was called a ‘local guy’) at the local program level, and I was also doing creative media and design projects for local and national stakeholders. My work overlapped with the development project in most rural communities in Berau under the coal mining concession area, including Dayak. This was my first experience of having privilege and opportunity of working work side-by-side with Dayak communities.

As a person who originated in a remote community, I always think about what the future means for the community. One of the biggest concerns of my parents was about their children's future education. There was no middle or high school in the area where I grew up. So, when I took up a creative media project (a short semi-documentary) with the Dayak, capturing what they have been through just to get primary education in 2012, I felt at the time that the future was still uncertain and that there had not been much progress from how it was when I went through my primary (elementary) education in the 90s in my village.

I collaborated with company health workers, local government officials, and Dayak people on a program health visit, where we came to local Puskesmas to assist in Dayak health. I reflected on this experience of how Puskesmas culture in rural communities was also disconnected, just like in the village where I grew up. The health workers who were officially placed in the Puskesmas were absent on most days because they didn't live there. At a community level, it lacked the basic health campaign promotional standards.

My views on the Dayak's life and struggle in East Kalimantan were shaped by the experience of living in rural areas in the region. As Dayak villages sit in coal mining concession areas, so does the village where I was born. However, while my village could not survive industrialisation, with almost all villagers choosing to move to cities (including my family), the Dayak people stay with their customs and traditions.

In Indonesia, the topic of Indigenous Dayak culture has attracted little research in the field of design. The lack of relevant literature required this research to align interdisciplinary knowledge from both the arts and social sciences to build an informed level of familiarity with the fields of Indigenous studies, cultural studies, and public health. At the same time, this doctoral research is positioned in the field of design studies as the centre of this research. It references and intersects related disciplines of epistemology, as design research should. Yet, this research does not claim to speak with expert authority in the areas of Indigenous studies and cultural or health studies. The study is set up from a design researcher's perspective and is explicitly focused on culturally sensitive design studies for health promotion in Indigenous Dayak communities in Berau, East Kalimantan.

1.5.2 On researcher reflexivity and intentionality

Researcher reflexivity. In the context of Indigenous research, Barton argues that using a participatory approach involves adopting a reflective and relational method that ensures respectful and ethical interactions (2004). Ruth Nicholls encourages researchers to engage in ongoing reflexive evaluations during the collaborative design, data collection, and analysis phases, being mindful of the interpersonal and collective dynamics that are

intrinsic to the research process (2009). This reflection helps navigate the complexities and internal inconsistencies that often surface in collaborative endeavours and recognise internal conflicts and contradictions (Fawcett & Hearn, 2004). Similarly, Richa Nagar and Frah Ali emphasises the need for researchers to reconsider their role within collaborative frameworks, recognising that they operate within a fractured space of delicate and shifting networks of connections and gaps (Nagar & Ali, 2003). Thus, reflexivity demands an understanding of the inherent uncertainties and changeability in participatory and collaborative research.

Cultural and medical anthropologist, Emma Esther Kowal (Kowal, 2006), posits that while reflexive processes in research can be distressing and make researchers feel vulnerable, these emotions are crucial, as they steer to vital negotiations within the research environment, demonstrating a dedication to Indigenous research methods. Researchers are encouraged to step back from central roles and question conventional views of control over research processes. Lous Heshusius advocates for researchers to define their work and roles in ethical, participatory terms (Heshusius, 1994). In this study, reflexivity was integral to the research methodology, facilitated by continuous journalling and a repetitive, collaborative method in both data collection and analysis.

In this research, immersive experiences are intertwined into the narrative structures of each chapter through various forms, including short vignettes such as *Kebersamaa*n with Kader Posyandu, Personal Autobiographical Notes, A story, and Under Cherry tree. These vignettes provide a vivid depiction of the complex, contradictory, and transformative spaces where the research evolved and relationships were established. Reflexivity is explored at a personal level, offering a detailed portrayal of the lived experience of a reflexive approach, resulting in a unique and practical understanding gained throughout the research process. This practice of reflexivity was crucial for respectful communication, building trustful relationships, and accurately reflecting the perspectives of the Dayak people.

Researcher intentionality. Reflexivity introduces the concept of intentionality, a critical element in this research (*see* Chapter 2.3 Part II Localised Design Intention (Niat) as Conceptual Framework). This section discusses my reflections on intentionality. In the sixth month of my stay in Long Lanuk Dayak Village, I conducted a series of participant observations (Chapter 3) and interviews with the local Dayak community (Chapter 4). Before conducting a design workshop (Chapter 5) with the Dayak Indigenous community in East Kalimantan, I encountered a profound dilemma concerning intentionality. This dilemma arose from the complex interplay between my intentions as a facilitator, the design aspirations of the Dayak community, and the potential consequences of our collaborative efforts.

At the core of my dilemma lay a fundamental question: What was my intention in facilitating this workshop? On the one hand, I was motivated by a sincere desire to empower the Dayak people, amplify their voices, and co-create solutions that would resonate with their cultural values and aspirations. I perceived this workshop as an opportunity to foster meaningful dialogue, cultivate trust, and facilitate a participatory process that would honour the knowledge and perspectives of the Dayak people.

On the other hand, upon delving deeper into my intentions, I started struggling with underlying uncertainties and complexities. Was I inadvertently imposing my own agenda on the Dayak people? Could my well-meant intentions unwittingly perpetuate colonial dynamics or undermine the sovereignty of Indigenous peoples? These questions weighed heavily on my conscience, bringing into relief the ethical intricacies inherent in engaging with Indigenous communities for research purposes.

Moreover, the dilemma I experienced was exacerbated by the diverse aspirations and hopes of the Dayak people themselves. While some members expressed enthusiasm regarding the workshop and welcomed the opportunity to engage in a collaborative design process, others remained sceptical or apprehensive; their concerns ranged from the fear

of exploitation and tokenism to doubts about the long-term impact of my workshop on their communities.

The design workshop I organised was meant to serve as a platform where local communities could share their narratives; these narratives would be translated into the design of a health journey map that would remain culturally relevant and in alignment with the lived experiences of individuals in remote areas. These workshops would acknowledge that local community members possessed an intricate understanding of their unique socio-political context encompassing geographic challenges, cultural norms, and community dynamics. I assumed that engaging them in a collaborative design storytelling process would enable them to reveal hidden layers of information overlooked by more conventional mapping endeavours. In remote areas, where traditional top-down approaches might fail to grasp the nuances of local health experiences, design workshops could empower individuals living in a particular community to articulate their unique stories, insights, and challenges pertaining to health services. Through such a participatory approach, one could attain a deeper comprehension of the complexities surrounding the access to health services in remote areas, paving the way for the development of more effective and sustainable health interventions aligned with the needs and aspirations of local communities. In this context, my design workshop would aim to serve as a conduit bridging the technicalities of health journey mapping with the diverse experiences shaping healthcare-seeking behaviour in remote communities.

When I was queried about my intentions by the village head, I conveyed my primary intention in the local language as a desire “to learn from local people”. The village head responded to my statement by affirming, “You are from this region, acquainted with its inhabitants and their backgrounds. Despite your potential formal education, there remains much to glean from their life experiences”. In light of my dilemmas and intentions, I subsequently approached this workshop with humility, openness, and a keenness to listen to and learn from the Dayak community. Rather than imposing my own solutions or

biases, it was imperative for me to create a space where Indigenous voices could steer the process and shape the outcomes.

Ultimately, my dilemma concerning the intentions behind facilitating a participatory design workshop with Indigenous Dayak communities in East Kalimantan served as a poignant reminder of the ethical responsibilities inherent in any engagement with Indigenous communities. It underscored the significance of approaching such endeavours with humility, reflexivity, and a dedication to decolonising practices. In fact, I realised that this commitment to decolonisation practices cannot be separated from the imperative of affording a platform where Indigenous people can voice opinions regarding their design intentions—an aspect of design studies that largely remains overlooked. Consequently, drawing from my research reflections, I underscored the importance of framing the voices of Indigenous peoples regarding their participatory designs as localised design intention, thereby providing a space for their perspectives and redirecting the focus of concomitant design intentions (which have traditionally been delineated through the lens of researchers or designers).

1.6 Structure Overview – Thesis Chapters

To elucidate the consideration of Indigenous perspectives alongside human-centred design within the local health design system in the context of the Dayak community of East Kalimantan, each chapter presents an exploration through a multidisciplinary lens involving design, health, and Indigenous studies. The structure of the thesis is as follows: Chapter 1 introduces the context; Chapter 2 discusses the theoretical, methodological, and conceptual frameworks; Chapters 3, 4, and 5 detail outcomes of the research in the field; and Chapter 6 concludes with the research findings. Each chapter explores the complexity through the perspectives of Indigenous standpoints and human-centred design, discussing how the amalgamation of these two elements is interpreted and framed within a localised design intention. I argue that localised design intentions could serve as a unifying tool or expression for local perspectives and human-centred

design to develop and enhance the local health design system for and by the local community.

In the introductory chapter (Chapter 1), I provide a brief contextualisation and outline of the topic and approach for this research project. I discuss my research questions and highlight the potential contributions of this study. This chapter also offers the geographical context of the research, describing Indigenous Dayak villages and communities in East Kalimantan. Additionally, I provide a concise description of my position and intention as the author and investigator, emphasising my commitment to transparency.

In Chapter 2, I present the identification, review, and discussion of literature, knowledge, methodological approaches, and commentary relevant to the core themes of this research: the Indigenous standpoint and HCD perspective in designing health systems, as well as understanding the value of local perspectives through localised design intention. The chapter elaborates on the grounding approaches for the research in three parts. Part I examines the theoretical underpinnings that inform this research. In Part II, the conceptual framework is developed based on the theoretical lens in this research, connecting these under the umbrella of localised design intention. Part III explains the methodological approach used in this research. In these three parts, a theoretical discussion on the Indigenous standpoint and review of design literature related to human-centred perspectives informing local health is provided. The literature regarding the value of local knowledge and perspectives in designing for Indigenous health is reviewed. Secondly, the chapter elucidates the methodological approach that aligns with the theoretical framework and contextual nuances of this research, proposing a set of methods to blend local and design terminologies to investigate Indigenous health within the selected approaches and context. Lastly, the chapter draws a connection between the theoretical and methodological approaches within the conceptual framework of localised design intention.

Chapter 3 applies these research approaches through an analysis of observations using visual methods, viewed through the lens of *kebersamaan* (togetherness). It addresses RQ1 by exploring the dynamics within current health systems in local communities and analysing these from both an Indigenous and human-centred design perspective. This chapter examines three case studies: fogging activities to combat malaria, the Posyandu program targeting child malnutrition and promoting health, and the use of visual aids like health promotion posters. These case studies are supported by numerous photographs from fieldwork, highlighting the challenges and resource limitations in rural health systems and the often overlooked local perspectives in their design. Despite these obstacles, the community leverages the principle of kebersamaan to make progress.

Chapter 4 delves deeply into Indigenous perspectives by amplifying local voices. It details the perspectives and imaginations of local people regarding health systems. This chapter answers RQ2: Considering the Indigenous standpoint, how do Dayak communities practise health in their daily life? Where do they access health information if they are seeking health alternatives from outside their communities? How do they perceive health promotion material when they are receiving health information from health workers outside their communities, and what considerations should be made when providing this type of support? Chapter 4 contains in-depth narratives, stories, and quotes from local individuals, providing insight into their experiences within these systems. The findings in this chapter are derived from the collection, interpretation, and analysis of semi-structured interview data conducted with 15 local participants, including 9 Dayak individuals and 6 local health workers. The interviews were conducted with the intention of engaging local knowledge, views and intentions, utilising a local term called pe' siu to establish dialogue in the form of interviews with community members. The objective of this chapter is to comprehend local experiences in health by situating their voices within Indigenous standpoints and HCD perspectives. This chapter discusses the interpretation

of these voices, connecting them to a broader perspective within this inquiry and research approaches. It concludes by identifying the contributions of this study to the knowledge of design and practices, arguing for the value of local standpoints as a means to listen and learn from local people in order to enhance the design of health systems, especially in this context.

Chapter 5 addresses RQ3: How is the HCD approach connected into local traditional knowledge and its local storytelling approaches through participatory design activity with the local community members in envisioning the future? This chapter describes the what, how, and why of the design workshop's pivotal role in collaboratively engaging community members to envision the future of health systems. The workshop engages with the idea of Indigenous storytelling as a sensitive design approach to accommodate a respectful and welcoming way to envision the future. The results presented herein stem from interpreting, reflecting on, and analysing data collected throughout the design workshop which involved eight local individuals. This approach accommodated their local knowledge and fostered a dialogical space for their aspirations regarding the design of health systems in their community. It advocates for the localisation of health system design, underscoring the importance of designing solutions tailored to specific community contexts. This chapter reflects on the contributions of participatory design workshops from a local standpoint to understanding the human-centred perspective in participatory design for local health and the intentionality arising from these intersections—an aspect currently undervalued within the scope of this research inquiry.

In the concluding chapter, Chapter 6, I first address the overarching question: How might local approaches to health be considered alongside HCD approaches to design better local health systems for local communities, and what are the implications of doing so? This discussion is based on a comprehensive reflection on the research approaches and activities of this study. Following this, I present the principal findings of each preceding chapter and elucidate their connections to the research questions and central

argument of the thesis. The chapter further elaborates on the contributions this thesis makes to design research, Indigenous studies, health, and interdisciplinary academia. Additionally, it discusses overarching themes that encompass the broader scope of this research, addresses limitations, and offers recommendations for future research endeavours.

1.7 Gaps, Objectives and Contributions

As I have explained, there is still minimal literature on the Dayak of Kalimantan, and what exists is primarily in the fields of linguistics and anthropology. This cannot be separated from the challenge of restricted access to conducting field research with the Dayak community, most of whom reside in remote or interior areas of Kalimantan. Thus far, no other research has been carried out with the Kalimantan Dayak Community concerning design and health. Dayak art and culture are gaining recognition among individuals engaged in fine arts and design, and are also frequently incorporated into contemporary design discourse in Indonesia and Malaysia. Nevertheless, there are very few records encompassing contemporary design ethnographic perspectives, Indigenous approaches, and contemporary design research that delve into local viewpoints and their involvement in studying design for local health. With this in mind, this study contributes insights into a series of connections that arise from an intricate network of local health, presented from an Indigenous standpoint and a design perspective.

This study aims to enrich the domain of health and design community through several pivotal contributions (Figure 21). Initially, it tackles the theoretical and knowledge voids by employing interdisciplinary methodologies that elucidate the synergy between HCD and Indigenous strategies. This fusion is explored with the intent to enhance health promotion within rural locales, exemplified by the Dayak communities in Indonesia. This aspect is vital to the research directive, aiming to unearth nuanced methodologies to deploy health-oriented design within nascent and localised societies. Contrary to well-developed regions, these communities typically grapple with scant social infrastructure,

modest levels of formal education, and rudimentary technological advancements. This scenario complicates their access to diverse media forms and the internet, presenting unique challenges that this research seeks to understand and mitigate through innovative design strategies.

Furthermore, this study bridges the evident methodological rift within the sphere of design research that is particularly noticeable within Indonesian contexts. By weaving Indigenous methodologies with ethnographic acuity into the design process, the research pioneers the study of the integration of local cultural values, Indigenous knowledge, and overall well-being into tangible health design outcomes. Additionally, the pragmatic void in design knowledge is addressed, offering critical insights that will aid designers in crafting culturally attuned healthcare solutions tailored for Indigenous populations in developing areas. These insights aim to provide a viewpoint for designers and researchers, as well as for profit, non-profit, and governmental institutions engaged in working with these communities. In the comprehensive discussions of Chapter 6, the study delineates its contributions further, tackling existing research gaps while laying down a scaffold for future inquiries in this evolving field.

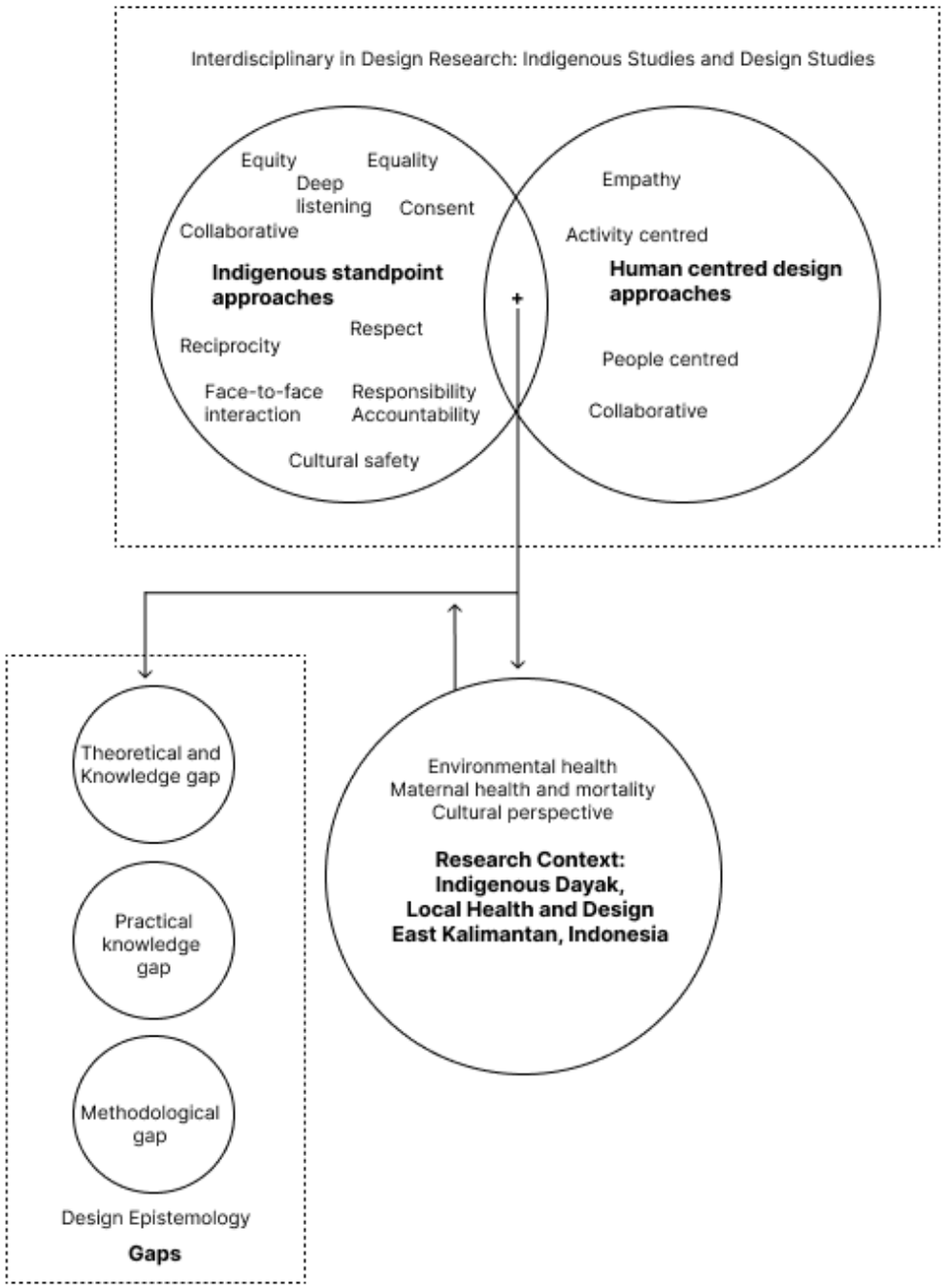


Figure 21 Conceptual map, my own creation based on current insights of this study.

CHAPTER 2 NAVIGATING APPROACHES TO RESEARCH IN A LOCALISED DESIGN HEALTH SYSTEM

This chapter identifies, reviews, and discusses literature, knowledge, methodological approaches, and commentary relevant to the core themes of this research: Indigenous approaches, design research and local health. Previous studies argue that local health design has often overlooked local voices and perspectives, leading to the provision of inadequate health services to local populations. Therefore, this chapter proposes the inclusion of the Indigenous standpoint as a lens to make visible marginalised voices in conjunction with the HCD perspective, in order to explore design for Indigenous health via localised design intention. To achieve this, Chapter 2 elaborates on the grounding approaches for the research in three parts. Part I examines the theoretical underpinnings that inform this research. In Part II, the conceptual framework is developed based on the theoretical lens in this research, connecting these under the umbrella of localised design intention. Part III explains the methodological approach used in this research. Lastly, this chapter summarises the approaches used in this research.

2.1 Introduction

In Western countries such as Australia, Canada, Denmark, New Zealand, Norway, Sweden, and the United States, Indigenous populations have consistently experienced poorer health outcomes (Ring & Brown, 2003). As of 2022, a striking example is the 10-year gap in life expectancy between Indigenous and non-Indigenous Australians (*Australia's Health 2022*, 2023). Similar life expectancy disparities are observed among Indigenous communities in Canada, New Zealand, and the United States. However, these health inequities are not limited to Western nations; Indigenous groups in regions across Asia, Latin America, Africa, and Eurasia also face significant health disparities (Stephens et al., 2005).

Indigenous populations across Asia encounter substantial barriers in accessing appropriate healthcare services, which significantly contributes to stark health disparities

when compared to other demographic groups within the continent. These disparities are deeply entrenched, manifesting in critically shortened life spans and heightened vulnerability to a range of health challenges. For instance, Indigenous communities disproportionately suffer from elevated rates of malnutrition and child mortality—a reflection of the chronic systemic neglect and the complex socio-economic factors that curtail their access to nutritional foods and essential health services. Furthermore, these populations are burdened with a higher prevalence of conditions typically associated with poverty, such as undernutrition and a spectrum of infectious diseases. This situation is exacerbated by living in remote or environmentally challenging areas that are often the least serviced in terms of healthcare infrastructure. Studies such as those by Affairs (Affairs, 2011) and the United Nations (UN, 2016) have documented these issues extensively, highlighting the urgent need for targeted health interventions within these communities.

The factors contributing to the unequal availability of healthcare services for Indigenous groups in Asia are multifaceted, involving historical, cultural, and logistical elements. One major issue is the geographic isolation of many Indigenous communities, which are frequently located in distant, often rugged areas far removed from urban centres where most healthcare facilities are concentrated. This geographical gap not only makes healthcare access physically more difficult but also complicates the delivery of medical supplies and the provision of continuous care. Cultural barriers also play a critical role, as there is often a significant disconnect between mainstream healthcare practices and Indigenous health beliefs and practices. This cultural dissonance can result in mistrust and underutilisation of available healthcare services, further widening the health disparity gap. Additionally, there is a critical lack of healthcare policies that are inclusively designed to accommodate the unique needs and circumstances of Indigenous populations. Together, these issues demand a concerted effort from governments, healthcare providers, and community leaders to forge effective partnerships that can

bridge these gaps, ensuring equitable health access and improving overall health outcomes in these vulnerable populations.

National governments often fail to prioritise the health of Indigenous peoples, leading to the neglect of their healthcare needs in the planning process (UN, 2016). Consequently, the representation of Indigenous peoples within the government system is either non-existent or weak, resulting in their voices remaining unheard (Lama, 2016). Additionally, mainstream healthcare services frequently do not extend to the remote regions where the majority of indigenous populations reside. Even when healthcare services do reach these areas, they frequently fall short in addressing the distinct requirements of Indigenous communities (Affairs, 2011; Lama, 2016). These services often disregard Indigenous belief systems and methods aimed at improving health and overall well-being. Addressing the disparities and deficiencies in Indigenous health is an imperative task, posing a challenge to many disciplines, including the design field.

Over the past few decades, the field of design has witnessed substantial expansion and evolution, which has progressed both the practice and understanding of design across various industries. This growth is not merely in the volume of work being produced but also in the depth and breadth of the methodologies employed. Traditionally focused on aesthetic and functional aspects, design practice has now diversified into more complex areas, such as: systemic design, which addresses the integration of systems within design thinking; social design, which focuses on the societal impacts of design; HCD, which places the user at the core of the design process; universal design, which aims for inclusivity and accessibility; and transition design. American designer Terry Irwin and her colleagues acknowledge these areas and incorporate a multitude of understandings of local ecosystems and cultures (Irwin et al., 2015, p. 10). Each of these frameworks broadens the horizon of what design targets and considers as its focus, moving beyond mere products to encompass services, experiences, and interactions. This shift reflects a growing recognition of the interconnected relationships among various tiers

of design—from the individual user level to the systemic and global scales (Irwin et al., 2015, p. 5).

The implication of these evolving design paradigms is profound, impacting not only how designers approach their craft but also how they conceptualise the very objectives and outcomes of design activities. With the adoption of frameworks like systemic and pluriverse design, the focus has shifted from creating singular, often isolated objects of design to developing solutions that are deeply embedded within a wider social, economic, and environmental context. This change is driven by an increasing awareness of the significant role that design plays in addressing complex global challenges such as sustainability, social inequality, and cultural integration. Moreover, these broader perspectives have encouraged the emergence of new design discourses and practices that are more inclusive, reflecting a shift towards more participatory, collaborative, and transdisciplinary approaches. Design has become a pivotal element in strategic decision-making processes, not only beautifying spaces or objects but also enhancing human experiences and solving intricate problems. As such, the role of the designer has transformed from a creator of content to a facilitator of change, leveraging the power of design to forge better futures. This shift underscores the dynamic and evolving nature of design, which continues to redefine its boundaries and increase its relevance in a rapidly changing world.

This chapter focuses on Indigenous health and design, exploring and reviewing the role of Indigenous approaches and HCD approaches in producing, expressing, and shaping Indigenous health and well-being and its communities. It seeks to theoretically answer how Indigenous approaches can be amalgamated for local health, focusing on an HCD approach for local communities. In Chapter 1, I briefly discuss how health is one of the key areas of inquiry within HCD research and design studies; previous studies have demonstrated the potential of its use in the context of health outcomes. However, there is still a lack of research within HCD concerning the influence of cultural-Indigenous

knowledge on design outcomes and their implications. This is despite the fact that previous researchers consistently argue that while trying to address local community health, it is critical to account for individuals' cultural background (Campbell et al., 1999; Kreuter & McClure, 2004). Thus, this study responds to the desire to explore HCD research intersecting with the local traditional knowledge approach in this design scholarship area, addressing the local community culture, and adopting cultural sensitivity, such as using Indigenous approaches (Bessarab & Ng'andu, 2010; Putt, 2013; Walker et al., 2014; Wilson, 2008).

Therefore, this chapter elaborates on the grounding approaches for the research in three parts. Part I (2.2 Part I Theoretical Lens) examines the theoretical underpinnings that inform this research. In Part II (2.3 Part II Localised Design Intention (Niat) as Conceptual Framework), the conceptual framework is developed based on the theoretical and methodological choices in this research, connecting these under the umbrella of localised design intention. Part III (2.4 Part III Methodological Approach) explains the methodological approach used in this research. Section 2.5 summarises approaches used in this research.

2.2 Part I Theoretical Lens

The main subjects of this thesis—Indigenous issues, culture, and health—have been examined in various research fields, including anthropology, sociology, media studies, Indigenous studies, arts, and public health. Although a broad understanding of this literature is valuable and insightful for developing the topic, its wide scope restricts the depth of comprehension achievable within this research. Therefore, this chapter will not be written from the perspective of an expert in all these fields, but rather as a design researcher who incorporates elements from each area to guide the direction, development, and consideration of insights for working on design projects with local communities concerning their health issues.

The guiding argument of my work is that when designing for local people, it is essential to account for the way in which their views and voices shape their own health, particularly when addressing and envisioning local health and its future in rural communities. In general, the goal of this research is to examine this argument through the lens of Indigenous standpoint theory (Foley, 2003; Nakata, 2007) by employing an amalgamation of HCD approaches and local knowledge. In doing so, this chapter will show how the design community can utilise an understanding of the relationship between local traditional approaches to health to achieve design outcomes that address Indigenous health disparities and promote Indigenous well-being.

2.2.1 Indigenous standpoint and approaches

My design research agenda in this chapter is framed by the approach of Linda Tuhiwai Smith (1999), a prominent Indigenous scholar, to inform my work with the local people in Indonesia. My research argues the need to value local knowledge in the work of design. It is surely not a new argument in design studies; however, my task here is to understand this value from a local perspective, and navigate my design research in a particular time and place. I recognise there are many issues revolving around the Dayak communities in East Kalimantan; in this research, I focus on the health issues which the Dayaks currently face, as a community who live in the shadow of the pandemic in a coal mining concession area, doubling their uncertainty about the future, about which I write in Chapter 1.

Indigenous standpoint represents a critical framework within the humanities and social sciences, aimed at addressing and prioritising the perspectives and epistemologies of Indigenous peoples. This approach challenges the dominant Western academic paradigms that often marginalise non-Western knowledge systems, advocating instead for a methodology that is deeply rooted in the cultural, historical, and philosophical bases of Indigenous life (Smith, 2012). Integral to this standpoint is the recognition of the inherent sovereignty and the right of Indigenous communities to articulate their own narratives and

priorities in research (Wilson, 2008). Academically, this perspective has been significantly influenced by scholars like Linda Tuhiwai Smith; in her seminal work, *Decolonizing Methodologies* (1999), she criticises the complicity of traditional research methods in the colonisation and oppression of Indigenous cultures. Smith proposes methodologies that transform the research process into one of empowerment for Indigenous peoples. Similarly, scholars such as Aileen Moreton-Robinson (2020) explore the dynamics of power and the interaction of the Indigenous subject in relation to the state, embedding the Indigenous standpoint within a broader socio-political context. These contributions underscore the necessity for a paradigmatic shift towards methodologies that are not only inclusive but are also reflexive of the power dynamics that influence knowledge production. The adoption of an Indigenous standpoint in academic research is thus seen as not simply a methodological choice but as a fundamental prerequisite for ethical research that respects and acknowledges Indigenous ways of knowing, contributing significantly to a more equitable and respectful engagement with Indigenous knowledge and lifeways.

In my study, I employ Indigenous standpoint as a pivotal framework to re-incorporate the perspectives and voices of the Dayak community into the exploration of local health systems. This theoretical lens critically examines the complexities inherent in the Indigenous experience, particularly how Indigenous groups manoeuvre within various spaces where their traditional knowledge systems are often challenged and undermined. The concept of an Indigenous standpoint is not merely an academic tool but a necessary paradigm to ensure that research is culturally sensitive and honours the epistemological contributions of Indigenous peoples. Sukuma Indigenous scholar, Hassan Iddy (2021), underscores this approach, advocating for research methodologies that are not only inclusive but also deferential, acknowledging the deep-seated knowledge embedded within Indigenous communities. Through such a lens, we gain a richer understanding of

the societal structures that marginalise these voices and the potential pathways towards more equitable health practices.

Martin Nakata (2007), one of the seminal figures in the formulation of the Indigenous standpoint theory in 2007, argued vigorously that the adoption of this perspective is crucial across various marginalised groups globally. These groups' unique insights and experiences have historically been excluded from mainstream intellectual discourse, resulting in a significant knowledge gap that perpetuates inequality and injustice. By embracing an Indigenous standpoint, researchers and designers can begin to dismantle the barriers that have historically silenced these communities. In many regions worldwide, the suppression of Indigenous voices is systemic, rooted in the continuous disregard for Indigenous methodologies, values, and principles that are critical to sustaining their communities and cultural (Iddy, 2021; Mkabela, 2005; Owusu & Mji, 2013). Therefore, adding the Indigenous standpoint into health system design not only challenges the prevailing inequities but also paves the way for a more inclusive and responsive healthcare framework that genuinely reflects the diverse tapestry of human societies.

Since then, previous academic efforts have increasingly implemented Indigenous perspectives into health research, recognising the unique and vital insights that these viewpoints offer. Notably, health sociologist Genevieve R. Cox and colleagues (G. R. Cox et al., 2021, p. 462) have articulated the necessity for ontological and axiological flexibility when adopting an Indigenous standpoint in health studies. This approach is not merely about adding Indigenous voices into the research but involves a profound transformation in how research is conceptualised and conducted. It necessitates acknowledging that both Indigenous and non-Indigenous researchers bring their diverse intersecting identities, which encompass multiple, overlapping, and complex social locations and epistemologies. This rich tapestry of backgrounds enriches the research but also adds layers of complexity in integrating these varied perspectives effectively. By using the Indigenous standpoint,

researchers like Cox (G. R. Cox et al., 2021) aim to decolonise social science methodologies within health research conducted with Native Americans communities. This theoretical framework does not only challenge the prevailing paradigms that have historically marginalised non-Western perspectives but also seeks to reframe the discourse, promoting a more inclusive and representative approach to understanding health phenomena.

Furthering this approach, Rural Health Researcher Terrance Cox and associates have explored how these frameworks can specifically enhance the cultural well-being of Aboriginal Elders (T. Cox et al., 2021, p. 916). Their research underscores the importance of culturally attuned health practices that resonate with the lived experiences and traditions of Indigenous populations. By focusing on cultural well-being, they highlight a critical aspect of health that is often overlooked in conventional health sciences— he interdependence of health and cultural identity. For many Indigenous communities, health is not merely the absence of illness but a holistic state that includes the well-being of the community, the strength of cultural ties, and the continuity of traditions. Through the lens of an Indigenous standpoint, T. Cox et al. (2021) illustrate how health interventions can be designed not only to support physical and mental health but also to nurture the cultural essence that sustains these communities. This shift towards a more culturally responsive and respectful approach in health research both aids in the healing and well-being of Indigenous elders and contributes to the sustainability and revitalisation of Indigenous cultures, offering a robust model for integrating cultural dimensions into health care practices.

G.R. Cox et al. (2021) emphasise the critical role of incorporating Indigenous researchers and supervisors in studies involving Indigenous communities to ensure the authenticity and ethical integrity of the research. They advocate for a collaborative research model where Indigenous and non-Indigenous researchers work in partnership, a synergy that can effectively address and mitigate complex health disparities prevalent

among Indigenous populations. This collaborative stance is anchored in adhering to ethical principles that are foundational to community-based participatory research, as outlined by Wallerstein et al. (Wallerstein et al., 2017). Participatory research is not merely a methodology but a research philosophy that underpins the importance of involving community members throughout the research process, ensuring that the research agenda aligns with the community's needs and that outcomes are actionable and beneficial to the community itself. In this framework, both sets of researchers, Indigenous and non-Indigenous, bring their unique perspectives and skills, fostering a rich, reciprocal exchange of knowledge and facilitating a more nuanced understanding of health issues as they are experienced by Indigenous communities.

This approach also provides a unique opportunity to innovate within the realm of HCD, which is intrinsically linked to participatory design principles. As suggested by (Hargraves, 2018), redirecting HCD to focus more intently on Indigenous health issues allows for the application of Indigenous standpoint principles within the broader discourse of design research. By amalgamating these with HCD principles, there is a potent opportunity to reposition Indigenous perspectives at the core of health interventions and design formulations. Such an amalgamation not only enriches the design process by embedding deeper cultural sensitivities and insights but also ensures that the solutions devised are genuinely reflective of and responsive to the unique needs and values of Indigenous populations. This pivotal alignment could significantly enhance the efficacy of designed interventions and contribute to the long-term well-being of Indigenous communities, placing them not as mere subjects of research, but as central, active participants in the creation of solutions that affect their lives. This idea both challenges existing power dynamics within research practices and paves the way for more equitable and inclusive health approaches.

2.2.2 Design approaches: Human-centred design framework and approach in health studies

In general, HCD is a design approach that focuses on questions, insights, and activities around the people for whom the design outcome is intended rather than the designer's personal creative process or the material substrates of the artefact (Bazzano & Martin, 2017; Bibb, 2020; Bollard & Magee, 2020; Drain et al., 2018). HCD is built on participatory action research (PAR) by moving beyond participants' incorporation and composing solutions to problems rather than solely recording them (Becker et al., 2020; Drain et al., 2018; Hargraves, 2018; Shrier et al., 2020). As a design process, HCD involves designers establishing and building a deep empathy with the people who are impacted by the design (IDEO, 2015). In this section, I first briefly outline the historical perspective on human-centred design as well as key issues in this design approach. I then look at how HCD approaches health studies, especially HCD and health studies that account for a specific context and its culture. Then I explain human-centred views in previous health studies. Finally, from related works, I identify HCD applications in design outcomes such as products and visual communication focusing on health.

2.2.2.1 Historical perspective and key principles in human-centred design

People are at the core of the HCD perspective. Design practitioners or design researchers or scholars working from this perspective attempt to display critical attention and sensitivity toward the people and their culture who are expected to use, be exposed to, or otherwise absorb the designed products in any settings such as social, cultural, service, or marketing. As a viewpoint, HCD is globally embraced both in academic research and studio practice. The following section briefly looks at the history that steers this embracement and its development in a bigger societal picture. In addition, to get a better view of HCD, I recount key ideas in HCD that have been discussed in previous HCD studies and research.

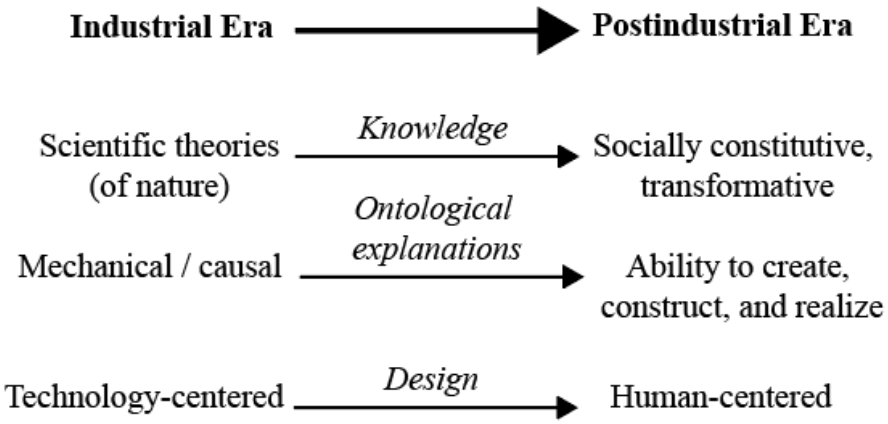


Figure 22 Shifts in societal dimensions toward human-centred design. Modified from Krippendorff (2005, p. 14)

Widely recognised as leading figures in design research, Nigel Cross (1981) and prominent design semantic scholar and professor, Klaus Krippendorff (2005) note that to understand how design has moved to HCD orientation from a technical or mechanical orientation, we need to look at the transformation from an industrial to a postindustrial society. Krippendorff offered a thorough examination of the societal changes that have taken place, encompassing aspects such as dominant currencies, hierarchical models, significant conflicts, and economics (2005, p. 14). Broadly speaking, these elements are interconnected. For the purposes of this discussion, two particularly relevant categories are epistemological and ontological explanations. Concerning what constitutes knowledge (epistemology), there has been a growing emphasis on human agency and social constitutive processes, marking a paradigm shift from knowledge models rooted in universal truths and objective methods towards those focused on the human and social dimensions. In terms of the nature of reality (ontology), explanations have transitioned from causal/mechanical frameworks to a broader recognition of reality as a social construct, highlighting the inherently human capacity to create, construct, and realise. Consequently, within this context of change, as depicted in Figure 22, the design field has

also shifted its focus towards the people who inhabit and interact with the design, including designed buildings, landscapes, products, artefacts, services, and technologies.

Both Nigel Cross (1981) and Klaus Krippendorff (2005) anticipated that a new paradigm for design is expected as an outcome of the shift from industrial to postindustrial societies. According to Cross (1981, 1982) and Cross et al. (1981), however, the paradigm attainment needs a reconstruction of designers' (both practitioners' and researchers') values, beliefs, and attitudes manifested in the act and designing nature. This research seeks to contribute to developing unification and to remind and support design practitioners and scholars in their endeavour to always include people in and throughout their design work as a fundamental principle of HCD.

In this paradigm shift, HCD can be seen as an umbrella term for broader approaches by design practitioners and researchers to involving the people for whom they are designing (Steen, 2011). Steen (2011) identifies a variety of HCD approaches: co-design, participatory design, ethnography, empathic design, the lead user approach, and contextual design. HCD approaches have dissimilar starting points and foci, different operationalisation techniques, and different methods and tools; this differentiation makes it hard to evaluate the outcomes of HCD studies (Bazzano et al., 2017).

Friess (2010) delineates two pervasive themes in HCD approaches that fundamentally orient how practitioners and researchers in this field operate. The first theme emphasises the necessity of engaging directly with individuals who are not merely users but are intrinsically linked to the design context itself, thereby ensuring that the design process is deeply informed by the experiences and insights of those it intends to serve. The second theme focuses on the strategic use of research to steer the design process, utilising a rich understanding of contextual user data to navigate towards effective and innovative design solutions. This approach is echoed by Steen (Steen, 2011), who asserts that the ultimate goal of HCD practitioners and researchers is to create products, services, and systems that align closely with the actual practices, needs,

and preferences of the users. This user-centric methodology necessitates a profound and empathetic understanding of how people behave, live, and interact within specific conditions and environments. By integrating this comprehensive understanding into the design process, HCD practitioners are able to develop solutions that are not only functional but also resonate deeply with user experiences and expectations, thereby enhancing the overall effectiveness and acceptance of the designed outcomes. In essence, HCD is about bridging the gap between users and technological or service solutions, ensuring that design decisions are made with a thorough consideration of the human context they are meant to complement.

HCD activities with people should offer those people possibilities to realise their desires and harmonise their actions toward something meaningful, reflecting a humble acknowledgement of human agency and its culture (Krippendorff, 2004, 2005). HCD practitioners and researchers should not portray themselves as “problem solvers” or “saviours” while working with their project in the community; rather, they should address themselves as active agents: those who could bring design to fruition, through this sensitive role (Krippendorff, 1989, 2005). Buchanan (2001) also echoed this reflection upon human sensitivity:

> Human-centred design is fundamentally an affirmation of human dignity. It is an ongoing search for what can be done to support and strengthen the dignity of human beings as they act out their lives in varied social, economic, political, and cultural circumstances. (Buchanan, 2001, p. 37)

Thus, applying an HCD perspective requires acknowledgement of human agency, competence, and participation. This is because an HCD vision carries the idea that people are creative, imaginative, accommodating, resourceful, and context sensitive (Krippendorff, 2004, 2005). A key concern of HCD is to create design and include people in the process, rather than excluding them from the conversation.

I have explored the historical HCD above mainly from a Western perspective in HCD. To briefly expand our understanding of HCD in contemporary discourse, I include

the critique of HCD that can be enriched by examining the works of various scholars who challenge the universalist claims often embedded in design practices. In their call to decolonizing design, Abdulla et al. (2016) highlight the need to address the systemic and hegemonic nature of Western design paradigms that marginalise non-Western knowledge systems. HCD, as developed in the Global North, assumes a standardised approach to problem-solving, often overlooking cultural contexts, local knowledge, and Indigenous ways of knowing. This flaw is further critiqued by Bidwell (2016), who examines how Western-centric frameworks in Human-Computer Interaction (HCI) and Interaction Design perpetuate colonial assumptions, failing to acknowledge the diverse cultural practices and worldviews that shape design processes in the Global South. The insistence on a universal design process can inadvertently impose Western values onto non-Western communities, undermining their agency and autonomy in shaping their own technological and social futures.

Further critique of HCD from western perspectives can be found in the works of Gregory (2018) and Janzer and Weinstein (2014), who argue that the global expansion of design anthropology and social design practices often carries implicit neocolonial tendencies. Gregory (2018) asserts that design anthropology, despite its potential for social impact, must remain wary of perpetuating colonial structures by imposing external solutions onto marginalised communities. Similarly, Janzer and Weinstein (2014, p. 331) point out that the dominant discourse of social design frequently aligns with neoliberal agendas, which focus on market-driven, top-down solutions, rather than empowering local communities to develop their own solutions. The shift from needs-based to desire-based frameworks, as discussed by Leitão (2022, p. 256), presents an alternative by emphasising pluralism in design, recognising that different communities may desire different outcomes based on their unique cultural and socio-political contexts. Escobar Arturo (Arturo, 2019) further reinforces this by advocating for autonomy in design, where communities have the right to define their own paths and futures. This perspective

challenges the Western assumption that design can be universal and highlights the importance of creating design processes that respect and integrate diverse cultural aspirations. I include this assertion to acknowledge and remind us of the potential insensitivity and lack of reflection in taking HCD from a Western standpoint. In addition, by providing this brief overview of critiques on HCD, I want to reiterate my view on HCD: I position HCD not as a design process or universal design, but rather as a humanistic philosophy to centre people in this study, where I consider Indigenous standpoints alongside HCD, which I elaborate on later in this chapter.

2.2.2.2 Human-centred design approach to health studies within and across cultural differences

With the central notion of people as a fundamental philosophy of the work, therefore, HCD has attracted global researchers across cultural differences. Several scholars from a broad range of disciplines have examined HCD, including setting HCD studies on health in a variety of contexts and settings. Health research on aspects such as health products, health promotions, and health program interventions has continuously been informed by the principles of HCD. Yan et al. (2021) utilised HCD to develop a campaign called “Little Mosquito, Big Problem” to fight malaria in Guyana in two phases: phase 1, define and phase 2, design & test. In England, a group of researchers (Morrison et al., 2015) used HCD to create an online website intervention for self-management of asthma, navigating HCD through two iterative phases: one paper-based and the other a digital-based prototype. Researchers from the University of California, Berkeley, collaborated with a local community in Oakland, United States, using Design Sprint to support the community-driven Best Babies Zones initiative that employed a HCD process: understanding, ideation, and implementation (Vechakul et al., 2015).

In Kenya, HCD was explicitly used in the study of Catalani et al. (2014) to understand the situation through the collection and analysis of data, to develop a new clinical decision support information system and implement and evaluate the system

across 24 clinics. Integrating tuberculosis and HIV care in Kenya, Catalani et al. (2014) created a clinical decision support health technology system by deploying the HCD process in three phases: hear, create, and deliver. Again, in the African context, a team of health educators lead by Stanford University researchers worked on South Africa's health education, creating video-based health education content using an HCD approach (Adam et al., 2019a). Adam et al. (2019) relied on an HCD collaboration technique in multimedia video production, such as creating animation assets and other visual elements using a narrative approach for health promotion. This was followed by Isler et al. (2019), who also studied video-based health education in South Africa. Isler's group created an iterative adaptation of a series of maternal nutrition videos, mHealth, by using HCD via a qualitative study (Isler et al., 2019).

The instances highlighted above represent just a few of the numerous contributions of HCD research within the healthcare sector. In their critical analysis, Bazzona and colleagues (2017) argue that the existing literature on the application of HCD in health research often fails to provide a thorough account of the methodologies employed, the findings obtained, and their implications for health outcomes. They further contend that there is a distinct lack of clarity regarding the outcomes that can be quantifiably measured through the use of HCD in health research. Bazzona et al. (2017, p. 17) underscore the necessity for future studies not only to define these measurable outcomes more explicitly but also to distinguish between the varying approaches of HCD. Such differentiation is crucial, as it influences how the design is implemented or operationalised within individual studies and across different academic fields. This, they suggest, will enhance the rigour of research designs and the applicability of results in practical healthcare settings, potentially leading to more effective health interventions and improved patient outcomes.

However, although HCD researchers implement or operationalise the HCD approach differently, most of the health research that uses HCD maintains the HCD

principle of putting people first and working with people in a culturally sensitive and empathetic manner. Cultural sensitivity is essential in any health issue (Resnicow et al., 2000); previous researchers consistently argue that it is critical to account for individuals' cultural backgrounds in addressing people's health (Campbell et al., 1999; Kreuter & McClure, 2004). HCD approaches have been modified by previous HCD researchers in order to address a specific culture in a specific context because there is no universal method that fits all. While HCD utilisation and operationalisation differ from culture to culture or context to context, the HCD principle remains: people are the centre of the process.

The application of HCD in global health is both promising and complex, particularly when it comes to implementing participatory approaches across different cultural contexts. While HCD's core principles, such as empathy with users, iterative prototyping, and co-design, offer a framework that encourages inclusivity and responsiveness to local needs, these practices often face challenges when applied to diverse settings (Bazzano et al., 2017). One significant critique is the tension between the flexibility and rapid iteration inherent in HCD and the more structured, evidence-based methodologies common in public health research. For example, HCD's reliance on iterative processes, such as prototyping and constant testing, can clash with the hypothesis-driven, rigorous evaluation standards often required in health systems and public health research. Additionally, the application of HCD across countries tends to favour Western-centric models that may not fully align with local traditions or community structures. This is noticeable in global health initiatives where design teams, often from the West, implement solutions that are not sufficiently grounded in the cultural and social realities of the populations they aim to serve.

Furthermore, there is an issue with the lack of long-term evaluation in many HCD-based health interventions, with few studies tracking the sustainability or impact of these projects on health outcomes over extended periods. The lack of standardized

methodologies for HCD and design thinking in global health means that many projects, while innovative, do not consistently provide the necessary documentation or rigorous evaluation required to measure their effectiveness in improving health (Bazzano et al., 2017, p. 17). In addition, the roles of local stakeholders and the dynamics of institutional partnerships are often underexplored, which limits the understanding of how HCD processes can be integrated into the existing health infrastructures and systems in low-resource settings.

Following this brief overview of HCD studies across cultures, I explore HCD utilisation in design studies conducted by previous researchers, focusing on design products and visual communication.

2.2.2.3 Human-centred design in the design outcome

HCD designers, Roshi Givechi, Ian Groulx, and Marc Woollard contributed a chapter to the book *Design Studies* published by Princeton Architectural Press in 2006. Discussing their multidisciplinary works, Givechi et al. (2006) describe their human-centred design approach that puts the people they design for first in their design process, and they outline an important role of graphic design or visual communication design work in the HCD process. Givechi et al. argue that an HCD approach enables graphic designers to create critical and informed design outcomes from the very start of the design process (2006).

Givechi et al. (2006) list five benefits for designers in the HCD process: (1) they can be observers of the people they are designing for; (2) they can inspire people to work in the focus group discussion or workshop; (3) designers have a good hunch/intuition and insights in tailoring a design product; (4) they can not only be creators, they can also edit the work they are designing from early sketches to properly develop a digital prototype; and (5) graphic or visual communication designers are story tellers, in which they are able to interpret, narrate, and communicate the project. Therefore, Givechi et al. conclude that

a graphic or visual communication designer has the ability to contribute to a HCD project as a whole (2006).

Pruitt and Grudin (2006) synthesised their HCD principle on the examination of visual persona through posters and other forms of design exploration. They suggest merging persona with other approaches such as participatory design and value-sensitive design, to engage and better represent people. Their study argues the importance of visual persona, where aspects such as gender, age, race, ethnicity, family, socioeconomic background, work and/or home environment as personal attributes provide an effective means for recognising and changing assumptions about people (Pruitt & Grudin, 2006).

Culturally sensitive visual representations of people and their culture have featured in HCD studies. Adam et al. (2019) and Isler et al. (2019) discussed the use of visual animation and graphic elements when narrating health in South African contexts. For example, Adam et al. (2019) represented the persona of African women with their traditional garments during pregnancy, and Isler et al. (2019) designed women's activities in accessing healthy foods in traditional African markets by adapting a traditional outdoor market environment. Moreover, United Nations' (UN) Women in Jakarta (Almuna et al., 2019) collaborated with Pulse Lab and Department of Foreign Affairs and Trade (DFAT) Australia in investigating safe transit for women who travel at night in Jakarta, employing an HCD approach. Called 'After Dark", this study creates a series of representations of women, showing their travel journey and its environments visually to reveal women's experiences in Jakarta during the night.

In this section (2.2.2.3), it is worth addressing critiques surrounding the design outcomes of HCD. Some critics argue that HCD's structured processes, such as the stages in the Double Diamond framework, can oversimplify the design process, leading to outcomes that may not align with the deeper needs of marginalised communities. The use of personas in HCD operations, such as in Adam et al. (2019) study, which represents the persona of African women in traditional garments during pregnancy, might be seen as

oversimplification. Some scholars argue that personas are a product of Western, individualistic design traditions that often clash with the collective and relational values of Indigenous communities. This can overlook power dynamics and marginalise local voices, reinforcing colonial paradigms of knowledge and participation (Agid & Akama, 2018; Akama et al., 2019, 2023). Some also argue that HCD often detaches the design process from the specific context of users, presenting solutions that, while user-centred in theory, may ignore the nuanced ways in which people interact with technology or products within their cultural and political realities. Furthermore, the replication of these models globally risks imposing a homogenised approach to design, sidelining local knowledge, practices, and traditions that do not conform to Western design standards (Ambole, 2020). Another major critique of HCD is that it frequently reinforces the status quo by failing to challenge existing power structures. The framework's focus on problem-solving can inadvertently support colonial and capitalist structures by treating the design process as a neutral, technical activity, thus obscuring the ethical and political dimensions of design. This lack of engagement with power dynamics means that HCD can perpetuate inequalities, particularly in global development contexts, as it has often been applied without adequate consideration of local expertise and cultural contexts, neglecting their knowledge and sovereignty (Ambole, 2020; Gutiérrez, 2020).

The above-named works are some of the growing body of human-centred case studies, critiques, and literature that address a specific individual background, culture, and context as this philosophy continues to develop in design practice, design education, and design research based on a democratic contextual premise in design inquiry. In addition, these works assume that HCD can be used to understand people within their cultural background and social context. The application of the HCD approach in my study of the Dayak people of Indonesia contributes to both design studies and Indigenous literature, since there is a lack of literature and lack of effort in such inquiry, especially in Indonesia.

2.3 Part II Localised Design Intention (Niat) as Conceptual Framework

2.3.1 Understanding niat (intention)

Every design starts with an intention. My recent fieldwork in Long Lanuk, a village nestled in the heart of East Kalimantan and sheltering its Dayak Indigenous community, presented unique insights into the intricate cultural dynamics that define local interactions in this village. Upon engaging with the village head, I was promptly questioned about the motivations behind my research, which involved a reflective inquiry deeply rooted in the local tradition of understanding niat (intention). Indeed, clarity of intention is essential to building trust and fostering respectful collaborations: it reassures a community regarding the sincerity and seriousness of external engagements (Sellato, 1994).

In the Indonesian context, the concept of niat or intention plays a pivotal and multifaceted role, transcending mere plans and entering the realm of moral and spiritual significance. Central to both everyday decisions and life-defining actions, niat encapsulates a deliberate and conscious determination to pursue a specific course of action. This notion is deeply embedded in various aspects of Indonesian life, including religious practices, wherein the purity of intention must precede all acts to ensure their spiritual validity; this holds true particularly in Islamic religio-cultural practices, where the intentions behind actions like prayer, fasting, and almsgiving define their religious worthiness (Geertz, 1971). Socially and culturally, niat influences interpersonal relationships and communal interactions, serving as a barometer that measures sincerity and ethical conduct. The depth of niat in Indonesian culture reflects a collective consensus that the integrity of one’s intent directly correlates with the ethical outcome of their actions, thus integrating personal, societal, and spiritual dimensions into a cohesive ethical framework that guides behaviour and interactions within a community (Hefner, 1993). This comprehensive integration of intentionality is crucial for maintaining social harmony and moral rectitude across diverse social strata.

The Dayak community places significant emphasis on the concept of niat, viewing it as a conscious and deliberate commitment to action. As Avé (1990) points out, in Dayak society, ethical considerations underpin all actions, making the clarity of intention fundamental to each action. Understanding the concept of intention within the Dayak context involves exploring the spiritual, ethical, and practical layers that guide both individual and community actions. Moreover, the Dayak people's interpretation of intention is not merely a philosophical concept but a practical guideline that influences their decision-making processes in their daily lives (King, 1993). This community's ethical framework is centred around the belief that clear intentions align with moral and spiritual purity (Kaskija et al., 2012).

This overview emphasises how the concept of intention provides insights into its meanings among local people, in turn offering a broader perspective on interactions between Indigenous and non-Indigenous communities. This perspective can be particularly useful in understanding how such communities navigate mutual understanding and cooperative efforts. Moreover, researchers and designers working with Indigenous populations can glean substantial benefits from the adoption of a mindful approach to intentionality; by aligning their objectives transparently with those of the community under study, they can mitigate potential conflicts and enhance collaborative outcomes (Sillander, 2004).

2.3.2 Intentionality in design

Intention occupies a central position in various cultural and philosophical discourses, exercising a profound influence on individual and collective behaviour. Academically, intention is viewed as a crucial psychological construct that underpins ethical decision-making and moral behaviour in societies. For instance, Bratman (1987) discusses intention as a part of practical reasoning that is crucial with regard to planning and committing to future actions that align with personal and ethical values. Further, Mele (1992) explores the role of intention within the framework of autonomous agency, arguing

that understanding intentions is key to deciphering human actions and interactions. Additionally, Searle (1983) integrates intention into the fabric of social reality, asserting that collective intentions play a fundamental role in the creation and maintenance of social structures and practices. Collectively, these perspectives highlight the multifaceted role of intention, not only in shaping individual choices but also in facilitating complex social interactions and maintaining societal norms and structures.

In the field of design studies, discussions surrounding intention in design have persisted for an extensive duration. American philosopher and professor at Massachusetts Institute of Technology, Donald Alan Schön (Schon, 1983, p. 280) introduced the concept of design as reflective practice, positing that design encompasses not only problem-solving but also learning from experience and adapting to evolving circumstances (Visser, 2010). He underscores the significant influence of designers' intentions on the shaping of their actions and outcomes, emphasising the iterative and adaptive nature of the design process. Building upon Schön's groundwork, Richard Buchanan explores the rhetorical aspect of design intentions (Buchanan, 1985); he contends that designers partake in a form of persuasive communication through their creations, aiming to convey specific messages and evoke particular responses. Buchanan's perspective underscores the pivotal role of intentionality in design, elucidating how designers strategically mould their creations to achieve desired outcomes.

In a complementary vein, previous studies delve into the influence of design intent on the fostering of innovation (G. C. Kelley, 2021; T. Kelley & Littman, 2004). They assert that successful design outcomes often stem from designers' intentions to push boundaries, challenge assumptions, and explore novel possibilities. G.C Kelley's scholarship underscores the significance of creative vision and risk-taking to the shaping of design intent. Expanding upon this argument, Margolin and Margolin (Margolin & Margolin, 2002) scrutinise the ethical dimensions of design intentions, contending that designers bear a moral responsibility to contemplate the broader societal impact of their

work and align their intentions with ethical principles. Thus, their scholarship underscores the imperative for designers to engage in critical self-reflection regarding their intentions and to prioritise social and environmental sustainability in their practice.

Further, Nelson and Stolterman (Nelson & Stolterman, 2014) introduce a comprehensive framework aimed at elucidating design intent. Their assertion posits that design extends beyond mere problem-solving to encompass deliberate alterations within a complex and unpredictable environment. The perspective presented by these scholars underscores the transformative capacity inherent in design intent, accentuating the significance of empathy, creativity, and systemic thinking in engendering favourable outcomes.

2.3.3 Intentionality issues in design

This section specifically examines intentionality issues in two design approaches: HCD and participatory design. In the former, intentionality is integral to ensuring that design products and services genuinely meet the nuanced needs of people. However, there are several issues and challenges associated with implementing intentionality effectively in the design process. For example, one primary concern involves the superficial application of user research that fails to capture the depth of user experiences and needs. As Sanders and Stappers (2008) point out in an article titled “Co-creation and the new landscapes of design”, the complexity of human behaviour often requires more profound, ethnographically-informed insights than conventional user research methods provide. Such a limitation can lead to a mismatch between the designed solutions and the actual user requirements, thereby undermining the efficacy of a given design. Furthermore, Krippendorff (2007), in “The semantic turn: A new foundation for design”, argues that a lack of holistic understanding of the user context—including a grasp of the socio-cultural and environmental factors—can result in designs that are technically sound but contextually inappropriate or irrelevant.

Another significant issue is the challenge of maintaining user involvement throughout the design process. Indeed, intentionality in HCD demands continuous engagement with the user, aimed at refining and validating design solutions iteratively. However, as Brandt and Binder (Brandt & Binder, 2007) point out, maintaining this involvement can be resource-intensive and logistically challenging, particularly in large-scale projects. This can lead to scenarios where initial user inputs are considered but subsequent refinements and iterations diminish user involvement, potentially leading to outcomes that are less aligned with user needs. Moreover, the power dynamics between designers and users can skew the interpretation and implementation of user feedback, as highlighted by Yanki Lee (Lee, 2008). A designer's preconceptions and institutional bias can also lead to the overriding of user suggestions, a phenomenon which hampers the ethos of HCD.

Finally, ethical considerations in HCD often pose a dilemma: while designers aim to create inclusive products, competitive pressures and economic imperatives can sometimes result in compromises that render these intentions peripheral. Cost constraints, for instance, can limit the scope of inclusive design practices, as discussed by Steinfeld and Maisel (2012) in "Universal design: Creating inclusive environments". Furthermore, the rapid pace of technological advancements can lead to a lag in ethical considerations, so that the implications of new technologies are not fully understood or considered in the design phase. As Friedman and Kahn (2002) elucidate in "Human values, ethics, and design", a skewed grasp of ethical considerations can result in products that, while innovative, may not fully account for user privacy, security, and the broader societal impacts. This misalignment poses significant risks, not just to user satisfaction but also to the societal acceptance and ethical viability of the designed solutions.

The above issues highlight the complexities and challenges inherent in the effective application of intentionality within HCD frameworks. Addressing them requires

not only a rigorous and empathetic approach to design but also an adaptable methodology that can respond to the dynamic interplay of technology, society, and human behaviour. Undoubtedly, to ensure the future success of HCD, one must foreground the necessity of refining these processes so that they can capture and integrate the full spectrum of human experiences and ethical considerations into the design process in a better way.

On the other hand, a participatory design approach—while striving to engage end users in the design process—frequently grapples with issues of intentionality within design studies. Scholars of participatory design have delved into the complexities and debates surrounding intentionality in this context, exploring their concomitant implications for design theory and practice. For instance, Schuler and Namioka (Schuler & Namioka, 1993) offer foundational insights into participatory design, underscoring its democratic and user-centred principles. They shed light on the intentional nature of participatory design, which seeks to empower end users and integrate their perspectives into the design process. However, the authors also acknowledge the challenges inherent in balancing designer intentions with user needs, particularly in situations where power dynamics may exert influence over decision-making processes.

Expanding on this perspective, Bødker (2006) explores issues of intentionality and argues that although participatory design aims to democratise the design process, it may not always involve an alignment of the intentions of designers and users. Bødker emphasises the importance of reflexivity and critical self-awareness in navigating the complex power dynamics inherent in participatory design, in order to ensure that a product designed via a participatory design process remains truly inclusive and equitable. In line with Bødker, Simonsen and Robertson (Robertson & Simonsen, 2012a; Simonsen & Robertson, 2012) provide a contemporary overview of participatory design theory and practice. Notably, they emphasise the intentionality relevant to participatory design, claiming that it is rooted in the principles of social justice and empowerment. However, the

authors also acknowledge the challenges of ensuring that participatory design processes remain truly inclusive and representative of diverse perspectives. In this respect, they highlight the important role of transparency, accountability, and reflexivity in addressing the problem of intentionality in participatory design.

Based on this perspective, Binder et al. (Binder et al., 2015) argue that participatory design can give rise to power imbalances, conflicts of interest, and ethical dilemmas. These authors call for a new discourse that recognises and addresses such problems of intentionality, emphasising the need for more reflexivity, dialogue, and negotiation in participatory design processes. To this end, Clemensen et al. (Clemensen et al., 2017) emphasise the importance of building trust and good relationships with end users and facilitating open and transparent communication during the design process. They especially highlight the need for designers to critically reflect on their intentions and assumptions, ensuring that participatory design processes are guided by ethical considerations and genuine collaboration.

In summary, intentionality in participatory design is a multifaceted and complex issue that encompasses power dynamics, conflicts of interest, and ethical dilemmas. When one considers Schuler and Namioka's emphasis on user empowerment, Bødker's exploration of power dynamics, Simonsen and Robertson's focus on social justice, Binder et al.'s discussion of ethical dilemmas, and Clemensen et al.'s examination of design practices, it is clear that the literature on intentionality in participatory design offers valuable insights into the challenges to and the opportunities provided by the involvement of users in the design process. By critically engaging with these diverse perspectives, designers can address issues of intentionality and foster more inclusive and equitable participatory design practices. However, while participatory design scholars have studied practices that are more inclusive and fair, they need to overcome the lack of reflective studies related to the intentions behind participatory design practices, especially the paucity of studies on ethics and design related to Indigenous communities.

2.3.4 On ethics, consent, and intention

While the section above discusses intentionality in design from a design-approach perspective, this section discusses its contextual position within the extant scholarly discourse. Ethical considerations in research with Indigenous communities within design studies are intricately linked to complex issues surrounding intentionality, power dynamics, and cultural sensitivity. Accordingly, my research involving the Dayak Indigenous community in East Kalimantan underwent a comprehensive research ethics consideration process. More generally,

Renowned Indigenous scholar Linda Tuhiwai Smith (Smith, 1999) offers fundamental insights into the ethics of research with Indigenous communities. She contends that Western research methodologies frequently perpetuate colonial power dynamics and marginalise the voices of Indigenous peoples. Smith underscores the significance of decolonising research practices and prioritising Indigenous perspectives and knowledge systems.

Adding to Smith's perspective, Kovach (Kovach, 2021) explores the issue of intentionality in research ethics concerning Indigenous communities. He argues that research involving Indigenous communities must adhere to the principles of respect, reciprocity, and relationality. Kovach emphasises the significance of establishing trust and cultivating genuine partnerships with Indigenous communities, in order to ensure that the concomitant research process remains culturally sensitive and ethically responsible. McGregor et al. (McGregor et al., 2018), delving into a discussion on intentional research ethics with natives, argue that research must be conducted in a manner that respects Indigenous peoples' ways of knowing and living, while also recognising the associated connections between storytelling, identity, and cultural revitalisation. Furthermore, McGregor et al. (2018) stress the importance of co-creating research methodologies with Indigenous peoples, thus ensuring that their voices and experiences are central to the research process.

Smith (Smith, 1999, 2005) addresses the issues of ethical intentionality regarding research with Indigenous peoples by arguing that such a research must be conducted in a manner that respects their rights, autonomy, and self-determination. Smith emphasises the importance of acknowledging past colonial injustices and undertaking efforts to decolonise research practices, which are aimed at promoting the sovereignty and well-being of Indigenous peoples.

Throughout history, Indigenous scholars have constantly delved deeper into the issue of intentionality in research ethics concerning Indigenous communities. They have argued that research should be anchored in Indigenous ways of knowing and being human, emphasising the significance of relationality, reciprocity, and responsibility. In particular, Kovach has highlighted the transformative potential of Indigenous storytelling work as a research methodology that honours Indigenous epistemologies and fosters meaningful engagement with Indigenous communities (Archibald, 2008; Kovach, 2021; Smith, 1999).

Further, the discourse surrounding the ethics of research with Indigenous communities in design studies underscores the importance of intentionality, cultural sensitivity, and ethical responsibility. Considering Tuhiwai Smith's emphasis on decolonising research methodology, Kovach's exploration of Indigenous methodology, Archibald et al.'s focus on research with Indigenous youth, and a variety of other relevant contributions, the literature on the ethics of research with Indigenous communities offers valuable insights into the complexities and challenges pertaining to ethical research in collaboration with such communities. By critically engaging with these diverse perspectives, researchers can address associated issues of intentionality and encourage more respectful, equitable, and collaborative research practices.

At present, research ethics throughout the world are regulated by ethics boards, such as the Human Research Ethics Committee (HREC) in Australian universities or Institutional Review Boards (IRBs) in the United States of America (US); these boards

typically provide researchers certain forms and questionnaires related to research instruments. These documents contain inquiries focusing on the intentions of the researcher and the objectives of the research that must be ideally established in collaboration with Indigenous communities. These research ethics instruments reflect the ethical discourse surrounding research with Indigenous communities, as discussed by Indigenous scholars (Archibald, 2008; Kovach, 2021; Smith, 1999). In Australia, there are distinct ethical requirements and principles that govern research involving Indigenous peoples and communities. However, the jurisdiction of university HRECs is largely limited to the approval of the research and the signing of consent forms (St John, 2022). In my case, following approval, the confirmation that my research ethics complied with the ethics board's policies and procedures enabled me to proceed to the field and conduct my research, which was framed by the considerations outlined above.

Intentionality becomes particularly crucial when considered with regard to vulnerable communities; these groups often face systemic marginalisation that can be inadvertently perpetuated through insensitive design practices. For example, Gautam and Tatar's work with survivors of sex trafficking in Nepal provides a profound case study regarding the importance of adopting an assets-based approach for participatory design with the aim of empowering these communities (Gautam & Tatar, 2022). The emphasis in Gautam and Tatar's (2022) approach is on leveraging the existing strengths and resources of the survivors—referred to as 'sister-survivors'—rather than focusing on their deficits. This shift in perspective not only challenges the prevailing deficit-oriented views but also facilitates a more empowering integration of the trafficking survivors into the design process as well as into the society at large. For instance, the use of collaborative and assets-based methodologies in participatory design helps in reconfiguring the relationship dynamics within shelters, turning them into environments where survivors actively contribute to and have a say in the organisational processes that affect their lives (Gautam & Tatar, 2022). Moreover, the authors state that such intentionality in design

acknowledges and respects the cultural and social complexities of the survivors' lives. It avoids the imposition of external solutions that do not resonate with their lived experiences and needs, thereby supporting a more sustainable and dignified reintegration into society.

An assets-based approach not only aligns with the principles of HCD but also echoes broader ethical considerations highlighted by scholars like Irwin, Kossoff, and Tonkinwise (Irwin et al., 2015) and Manzini (2015), who advocate for designs that are deeply rooted in local contexts and that promote social sustainability. Seen through such a lens, Gautam and Tatar's (2022) method serves as a critical example of how designers can and should approach design intentionality with respect to Indigenous and vulnerable populations in order to foster true empowerment and systemic change.

2.3.5 Conceptual framework local standpoint and human-centred design in localised design intention

Designing for local communities with respect to intentions that are aligned with local design goals necessitates an approach that accounts for the cultural values, traditions, and socio-economic realities of such communities. The idea of localised design intention I have adopted for this research is a form of advocacy that encompasses six main aspects: comprehensive understanding of the community through active involvement, collaborative and participatory design intentions, utilisation of local knowledge, implementation of HCD principles, flexibility, reflectivity and sensitivity

*Understanding the community***.** Localised design intention aims to thoroughly understand a community through active engagement. This involves conducting surveys, interviews, and participatory workshops to gather comprehensive insights into the needs, challenges, preferences, and aspirations of the given community (as outlined in Chapters 3, 4, and 5). It is crucial for the researcher to listen attentively to their stories and experiences, as they provide essential insights that help the designer to tailor designs to their specific contexts. For instance, in Chapter 3, we discover how, in the life of the rural

community, the current healthcare system affects their daily lives. They interpret their circumstances in a spirit of togetherness by considering the limitations of resources and infrastructure. A deep appreciation of and sensitivity toward the cultural norms and values of the given community are vital; these ensure that the formed design respects local traditions and integrates and meaningfully celebrates them. Here, cultural sensitivity becomes particularly significant, as discussed in Chapter 3, for the Dayak community's local health traditions and practices have been passed down through successive generations. The Dayak people wish to continue adhering to these traditions within their community; however, they are open to harmonising these traditions with modern health and medical models. Nevertheless, this openness should not be taken as a pretext for the aggressive and insensitive dominance of modern health models over the traditions that constitute the cultural fabric of the Dayak community. The Dayak people hope that this openness is approached wisely; they want health designers to involve them and listen to their relevant opinions, as conveyed by one of my interview participants.

*Defining design intentions***.** Second, localising design intentions involves setting clear objectives in collaboration with a local community. These include establishing realistic goals, such as enhancement of services, facilities, and local health education, in alignment with the community's long-term vision. These design intentions were expressed by the local Dayak community in our workshop. As mentioned in Chapter 4, the local Dayak community members expressed their desire to be involved in this design process; unfortunately, they claimed, the existing healthcare system still overlooked local voices. In the future, ideas expressed by these local voices could be utilised to formulate design intentions tailored to the needs and desires of the local community. These objectives could be achieved through collaboration with the local community and their active participation. This could be facilitated by meetings and discussions with the local community, like those I have mentioned in Chapter 5. In fact, the findings mentioned in Chapter 5, revealed by the participatory workshops, could help us reflect on the past,

assess the current conditions, and plan for the future of the local Dayak community's health. In this inspirational context, one must open up spaces for dialogue that can be used to contextualise localised design intentions and set joint objectives; this can be done by, for example, mapping a health journey that meets the needs and heeds the voices of the local community.

Integrating local perspectives and knowledge. Third, by adopting design intentions that are locally oriented, we can enhance our sensitivity with regard to the incorporation of local knowledge and materials in designs that become more relevant and represent a given local community accurately. Indeed, one of the findings of Chapter 3 was the lack of local representation in the visual aids (VAs) used to promote and educate the Dayak community about health. Moreover, the community was not even involved in the design process of these VAs. Nevertheless, the community members did express their desire to collaborate in discussions aimed at improving the health of their community. Chapter 4 records the local voices sharing information about traditional health practices within the community traditions, hoping that such information could be used to enrich both traditional and modern health techniques. Chapters 3, 4, and 5 narrate how local voices contributed to a shared vision of future health design for the Dayak community. In this collaborative participation, the Dayak people articulated their desires, hopes, and dreams regarding the local health system and its elements. The findings from Chapter 5 emphasise the importance of creating relevant designs that involve the local community, capturing the ideas behind localised design intentions to ensure that the resulting designs are not only functional but also respect local expertise, ideas, and wisdom.

Considering human-centred design. Fourth, localised design goals can form an integral aspect of the implementation of HCD principles. Empathetic planning involves placing local community members at the core of the design process, ensuring that solutions are specifically tailored to their actual needs and, thus, are more likely to be accepted. Establishing mechanisms for the reception of ongoing feedback during the

design process, including iterative testing and refinement with community involvement, is crucial to ensuring that a final product truly meets such local needs. In fact, the findings in Chapter 3 regarding current health issues in the Dayak community revealed that the existing health designs failed to meet the needs of the local populace. In designing health systems aimed at improving community well-being, the adoption of HCD is of paramount importance, as evidenced by previous studies (*see* Chapter 2). Moreover, in Chapters 3, 4, and 5, we explore the concept of empathy from an HCD perspective, placing the local community at the heart of the design intentions and objectives; this fosters collaborative discussions between the researcher and the community.

Reflectivity and sensitivity. Reflectivity and sensitivity in research with Indigenous Dayak people are essential for addressing the tensions and power asymmetries inherent in such work. As outlined by Öz and Timur (2022), reflexivity involves a continuous self-examination of the researcher's positionality, considering how their identity and biases affect interactions with the community and the interpretation of knowledge. This self-reflection becomes crucial when dealing with local knowledge, which may be misrepresented or colonised by the researcher's assumptions (Smith, 2008). Sensitivity, as highlighted by Akama et al. (2019), entails recognising the complexity of power relations within Indigenous communities and the need for collaborative, respectful engagement with local knowledge. The tensions between Western methods, like HCD, and Indigenous worldviews often arise from the imposition of external frameworks that fail to acknowledge the deep cultural and ecological connections of Indigenous communities (T. Schultz, 2018). These power dynamics must be carefully navigated by giving voice to local perspectives while ensuring that the research process does not silence or marginalise certain groups within the community. As noted by Akama et al. (2019), a critical reflexive approach helps design researchers to confront these tensions by incorporating Indigenous epistemologies in ways that empower communities, rather than perpetuate colonial hierarchies. This viewpoint is about understanding the local context

and being accountable for the roles researchers play in shaping the intended outcomes of the research.

Flexibility. Finally, the concept of localised design objectives can guide the planning of flexibility and scalability. Ensuring a focus on localised design intention, we can develop designs that are easily adaptable to the changing local needs and conditions, thus allowing these solutions to evolve alongside the local community and enhancing their longevity and relevance. This point was articulated by the local community, as mentioned in Chapter 4; the Dayak people expressed a desire for a management-oriented approach to health design development that would remain flexible to the unique conditions of their community, specifically including the arrangement of water health management systems.

Furthermore, flexible localised design intentions include ensuring a transparent design documentation that can provide a platform for community input and facilitate adjustments during the design process, as stated by the Long Lanuk residents (in Chapters 4 and 5) with regard to the management of health systems using traditional knowledge. Such a system should be transparent and open, allowing the local community to continuously provide inputs and participate flexibly in its own development.

2.4 Part III Methodological Approach

To unravel the complex interplay between HCD and local knowledge in health systems via localised design intention, a qualitative research framework that spans several methods was needed, utilising an interpretative approach grounded in design ethnographic sensibility (Blomberg & Karasti, 2013; Jonas et al., 2017). In this research, a comprehensive suite of qualitative methods was deployed, including observation, interviews, design workshops, textual analysis, and visual methods, each chosen to enhance the depth and breadth of the contextual inquiry. These methods were specifically tailored to examine how HCD principles integrate with and adapt to local knowledge systems, a critical evaluation that seeks to bridge global design practices with Indigenous understanding and applications. By conducting observations, the research captures real-

time interactions and behaviours within health settings, while interviews provide personal insights and narratives that underline the subjective dimensions of healthcare experience. Design workshops facilitate a collaborative space for stakeholders to co-create solutions, thereby embedding local insights directly into the design process. Textual and visual methods, on the other hand, allow for the analysis of cultural expressions and communication patterns within health contexts, offering a layered understanding of how local knowledge influences and shapes design outcomes. These methods aim to enrich the research fabric as well as to ensure that the findings are robust and reflective of the complex dynamics at play. Contextualising these methods within design studies highlights the nuanced interaction between structured design processes and the adaptive, often tacit, knowledge that local contexts provide, thereby promoting designs that are sensitive and responsive to the local populace's needs. The integration of these approaches, therefore, facilitates a more comprehensive understanding of HCD applications in health systems, critical for developing solutions that are both innovative and grounded in a real-world context. The methods are detailed below.

2.4.1 *Kebersamaan* participant observation

One of the core methods employed in this study is participant observation, as described by Van Maanen (1995). Participant observation involves gathering data on interactions and relationships by recording behaviour, conversation, and experiences in the actual setting. While participants in research are typically referred to as informants, in human-centred research, they are often categorised as users, consumers, or citizens. However, in the context of this study involving the Dayak people, they are viewed and written about as *mitra kolaborasi* (collaborators) rather than being placed into predefined categories.

Moreover, participant observation represents a methodological cornerstone in ethnographic research, particularly within the context of studying cultural specificities in localised settings (Geertz, 1972, 1973). This approach entails researchers immersively

embedding themselves within a community, participating in and observing daily activities to gain a deep, nuanced understanding of the community's social interactions, rituals, and behaviours from an insider's perspective. Such immersion allows researchers to transcend the superficial layers of cultural practice and access the subtle, often unspoken elements of social life that are crucial for comprehensive cultural interpretation. Emphasising context-specific research, this method addresses the complexities that generic observational strategies might overlook, offering insights tailored to the unique dynamics of each community (Fetterman, 2013; Higginbottom et al., 2013).

In this study, I incorporate the local concept of kebersamaan into my observation in Chapter 3. Kebersamaan, a foundational element in local traditions, epitomises the ethos of living together harmoniously regardless of the circumstances faced. This principle is deeply embedded in Dayak culture, fostering trust, friendship, and communal unity. During the kebersamaan-based participant observation, I actively engaged in village activities to establish connections with community members, nurture a sense of belonging, and foster mutual understanding. This immersive engagement allowed for a comprehensive observation of the locals, providing insights into their daily interactions, routines, and narratives. Moreover, the scope of observation extended beyond human actors to include other species and non-human elements, as highlighted by Tim Ingold (2000), who emphasises that our lives are interwoven with materials, weather, animals, plants, and machines. This broader ecological perspective is crucial, as local traditions and knowledge systems often encompass a dynamic interplay between humans, other species, and the non-human spiritual realm (*roh*), which are integral to both the present and the future societal fabric.

2.4.2 Pe' siu interview

While I lived in the Dayak community during this fieldwork, interviews were conducted to facilitate open dialogue, shared stories, and collaborative exploration (*see* Table 2; *see* Chapter 4 for the interview outcomes and interpretation). In this context, I

conducted pe' siu interviews—a method specific to the involved cultural context. Open discussions werere initiated with local people or mitra, allowing for an in-depth exchange of views and insights. As a fundamental aspect of ethical research practices, it is imperative that all participants are fully informed about the objectives of these interactions and are provided with consent forms to signify their agreement to participate. This ensures transparency and respects the autonomy of the participants. All interviews were digitally recorded to accurately preserve the information exchanged, and conducted in Indonesian interspersed with local dialects to ensure clarity and cultural relevance. Subsequently, these recordings were transcribed and translated into both Indonesian and English, providing a basis for sending them back to the interviewees for further clarification if needed, thereby adhering to rigorous academic and ethical standards.

Table 2 Research participant overview

No	Pseudonym name	Gender	Category	Data collected	Location
1	Pejangaaq	Male	1, 3	Interview	A
2	Kapat	Female	1, 3	Interview	A
3	Pengerai	Male	1	Interview	A
4	Puyuuk	Male	1	Interview	A
5	Hapit	Male	1	Interview	A
6	Kanam	Male	1, 3	Interview	A
7	Bemanuk	Female	1	Interview	A
8	Kasaq	Female	1, 2	Interview	A
9	Ketigaaq	Male	1	Interview	A
10	Mariang	Male	2	Interview	B
11	Kakuring	Male	2	Interview	A
12	Bahenda	Female	2	Interview	B
13	Mahilak	Female	2	Interview	B
14	Babilem	Male	2	Interview	B
15	Bahandang	Male	2	Interview	B

Note. **Category:** 1—Dayak; 2—local health worker; 3—Dayak elder.
Interview **Location:** A—Long Lanuk Dayak Village; B—Tanjungredeb

Pseudonym name: All names are pseudonyms using the names of the months and colours in Dayak language.

Moreover, the research extends beyond the Dayak community to include non-Dayak individuals who are integrally connected with Dayak society, such as representatives from local health work and local healthcare institutions. Engaging a diverse group of participants not only enriches the data with multiple perspectives but also enhances the understanding of the interconnections within the societal fabric. These interactions are vital for constructing a comprehensive view of the community dynamics and the various external influences that may impact them. The inclusion of such a wide range of voices supports a more nuanced interpretation of the social and cultural landscapes and helps identify potential areas for intervention or support. This methodological inclusivity is essential for producing research outcomes that are not only reflective of the Dayak community's intrinsic cultural and social nuances but also of their interactions with external entities, thereby fostering a holistic approach to understanding and documenting cultural heritage and societal interactions (Kovach, 2009; Wilson, 2008). Through such deliberate and ethical engagement, the research promises to contribute significantly to both academic knowledge and community empowerment.

2.4.3 Localised design workshop

A localised design workshop in this study operated as a Dayak collaborative storytelling workshop. In this study, I conduct a design workshop with eight local people (Table 3; *see* Chapter 5 for the outcome of design workshop). Workshopping with people is a fundamental concept in human-centred research. An issue that can arise in collaborative workshops is the limitation of skills and unequal positioning between collaborators and facilitators. In this research, collaborative storytelling may be seen as an emerging sphere of creativity, dialogue, listening, knowing, and learning. Through the workshop, ideas for collaboration and partnership can be collected, sifted, and aggregated. The main focus of the workshop in this research is to bring together local

people and provide a platform for them to share their stories through Indigenous storytelling (Barcham, 2021). This exploratory event serves as opportunities for envisioning, dreaming, and designing an uncertain future.

Barcham (2021) revisits the profound realm of Indigenous storytelling through the lens of what Russell Bishop (1999) has termed 'collaborative storytelling.' This approach is pivotal in harnessing the collective and dialogic essence of Indigenous communities, unifying their voices and local knowledge systems into the design process. Collaborative storytelling is not merely a method of information gathering; it is an act of empowering communities and recognising their integral role in crafting narratives that influence design philosophies and outcomes (Bishop, 1999; Wilson, 2008). This participatory technique ensures that the design process respects and incorporates the existing cultural and traditional frameworks within the community, thereby promoting designs that are not only contextually appropriate but also culturally resonant. The engagement of Indigenous knowledge through storytelling transforms the design process from a top-down imposition to a communal and dialogic exploration, thereby aligning with broader ethical considerations of respect and inclusivity in research and application.

Table 3 Research workshop participant overview

No	Pseudonym name	Gender	Data collected	Location	Duration
1	Lejuh	Female	Workshop	Long Lanuk	3 hours
2	Sului	Female	Workshop	Long Lanuk	3 hours
3	Laai	Female	Workshop	Long Lanuk	3 hours
4	Duhung	Female	Workshop	Long Lanuk	3 hours
5	Lancim	Female	Workshop	Long Lanuk	3 hours
6	Beliu	Female	Workshop	Long Lanuk	3 hours
7	Pelay	Female	Workshop	Long Lanuk	3 hours
8	Ayan	Female	Workshop	Long Lanuk	3 hours

Note. Pseudonym: All names are pseudonyms using names of Dayak villages

Furthermore, the idea of listening, sharing and envisioning, central to the collaborative workshops, underpins the creation of designs that are better suited to meet the needs and aspirations of the community. Engaging directly with community members in their own socio-cultural contexts facilitates a mutual learning experience and fosters a shared commitment to enhance local health through the design outcomes (Hart, 2010; Jonas, 2017). This approach not only enriches the design activity with a plethora of local insights and alternatives, but also ensures sustainability and greater acceptance of the final designs. The workshops serve as a dynamic platform where diverse viewpoints are shared and synthesised, leading to innovative solutions that are reflective of collective input and expertise. By prioritising local contexts and embedding Indigenous methodologies within the design process, such collaborative ventures uphold the principles of cultural sensitivity and appropriateness, thereby contributing to a more inclusive and equitable field of design research (Kovach, 2009; Wilson, 2008). This engagement is essential for producing designs that are not just functional but meaningful and that embody the values, histories, and future aspirations of Indigenous communities.

2.4.4 Textual analysis

As a qualitative interpretative research method, textual analysis can be utilised to understand and interpret texts. Texts encompass language, symbols, and images/pictures. Textual analysis is often employed to comprehend the meaning of texts, connecting them to the given context (Hawkins, 2017). Through textual analysis, available information concerning Dayak can be gathered and analysed, particularly focusing on how they are represented in artifacts such as artworks in their community hall, tattoos on their bodies, and how Dayak representation is portrayed in contemporary texts produced and published outside Dayak communities or by stakeholders. By employing this method, information can be gathered to facilitate discussions within Dayak communities, and the analysis can serve as a 'baseline' for discussing the perspectives of Dayak people and

how their understanding of their lives, practices, dreams, and future complements or diverges from the vision of external communities (non-Dayak world).

2.4.5 Visual methods

The integration of visual methods within the qualitative fieldwork employed in this study enhances the understanding of the Dayak communities' cultural dynamics by capturing the essential visual nuances of their daily and ceremonial life. During gatherings and events, which are central to the Dayak tradition of community bonding and social interaction, participant observation serves as a critical visual method. My involvement in these gatherings provided unique opportunities to visually document a variety of community interactions, from the intricate rituals of communal meals to the subtle dynamics of informal conversations. This visual documentation captures the rich tapestry of Dayak social life, not just in photographic or video form but also through detailed observational notes that highlight body language, spatial arrangements, and the physical setting—all aspects that traditional textual data collection methods might overlook (Pink, 2014, 2020). This approach aligns with Sarah Pink's argument that visual ethnography can reveal aspects of social environments and interactions that are unattainable through words alone, providing a deeper understanding of the community's cultural practices (Pink, 2014).

Furthermore, the use of visual tools extends into Pe' siu interviews and participatory design workshops, which incorporate recorded discussions and visual aids such as diagrams and storyboards to facilitate collective ideation processes. These methods, while traditionally verbal and textual, are enriched through the integration of visual elements that help articulate and share complex community narratives and insights more effectively. Textual analysis complements these visual and verbal methods by examining both visual (e.g., photographs, videos) and textual artifacts (e.g., transcribed interviews, community documents). This analysis enables researchers to explore how the Dayak people represent themselves in various media and how they are perceived by

external entities. By combining these diverse methods, the study constructs a comprehensive interpretative framework that highlights the Dayak's intricate social networks, cultural norms, and their negotiation of internal traditions against external influences. This multidimensional portrayal respects and amplifies indigenous voices, adhering to Fetterman's (2013) advocacy for ethnographic methods that honour native perspectives and contribute to a more empathetic and accurate representation of the cultural “other”. This integration of visual and traditional qualitative methods not only enriches the dataset but also aligns with the ethos of participatory research, promoting a collaborative and inclusive research environment.

2.4.6 Data analysis and interpretation

Qualitative researcher Pamela Baxter and Susan M. Jack (Baxter & Jack, 2008) note that data collection and analysis in qualitative research often happen simultaneously. Cohen et al. (2000) describe data analysis as a dynamic process that is consistently adjusted, refined, and expanded. John W. Creswell and David Creswell (Creswell & Creswell, 2017) identify coding as a key method used during data analysis, which aids in summarising and interpreting results. This early stage of data analysis is crucial for identifying consistent themes emerging from local people’s responses.

Themes emerged in the research by identifying patterns of similarities and differences in the interview data. The process began with gathering data through interviews and discussions, which then evolved into themed analysis supported by relevant theories and frameworks. Qualitative researchers describe the method of analysis as research abduction, used to derive explanations for the posed questions; it is characterised as the most suitable approach for making informed judgments from the collected data in case studies (Creswell & Creswell, 2017; Creswell & Poth, 2016). In interpreting these findings, my goal is to elucidate and contextualise the local people's feedback, integrating all data from my fieldwork into a narrative that aligns with the theoretical underpinnings of this research.

2.5 Discussion

In this section, I discuss the appropriateness of the context, the conceptual–theoretical lens, and the methodological approach for this research topic.

2.5.1 On theoretical lens: Health, HCD, and Indigenous standpoint

Having briefly discussed the context of the Dayak's health, the Indigenous approach through an Indigenous standpoint landscape and the HCD perspective in design, I address how to harmonise the Indigenous approach and HCD in understanding Dayak's health through theory. In doing so I emphasise whether, if at all, HCD conceptual principles contradict Indigenous standpoint principles.

Firstly, Indigenous standpoint stands for culturally safe, responsive, and respectful research, emphasising Indigenous ways of knowing that are culturally specific (Ntseane, 2011; Stoffer, 2017). Indigenous standpoint acknowledges that people need to be understood within contexts such as their social, political, cultural, and historical contexts (Iddy, 2021; Louis, 2007; Mkabela, 2005; Nakata, 2007; Stoffer, 2017). This core Indigenous standpoint principle enforces seeing Indigenous people holistically within their contexts, which goes well with the HCD perspective that puts people and their background first in any design process (Givechi et al., 2006). HCD attempts to pay critical attention to and be sensitive toward people and their culture who are expected to use, be exposed to, or otherwise absorb the designed products in any setting (Krippendorff, 2005), while always respecting human sensitivity and dignity (Buchanan, 2001). Indigenous standpoint and HCD are interchangeable concepts and will inform each other to engage with the Dayak Indigenous context in carrying out this study.

Second, Indigenous standpoint argues for repositioning Indigenous people in the research process as 'knowers' rather than as 'informants', whereas in the past Indigenous people were treated as 'informants' by Western colonialisation as well as by the Western research approach (Iddy, 2021). This repositioning embraces a collective, communal approach or togetherness to gather information so that the reality can be understood, and

authentic knowledge can be produced (Hart, 2010; Mkabela, 2005). Thus, Indigenous standpoint offers a collaborative approach where Indigenous people are accommodated in participating and providing inputs in the research process (Hart, 2010; Smith, 2005). This collaborative value of Indigenous standpoint is supported by HCD, which places co-creation or people's participation at the heart of knowledge generation in the HCD process (Bazzano et al., 2017; Bibb, 2020; Bollard & Magee, 2020; Drain et al., 2018, 2019).

Lastly, while Indigenous standpoint suggests that only Indigenous people should be the ones to conduct research regarding Indigenous people, some researchers interpret this to mean that non-Indigenous researchers can work with Indigenous people as long as respectful engagement is maintained, and ethical principles are followed. In addition, the research should have a commitment to Indigenous communities, by building harmony and reciprocating by giving back, and should aim for truth, justice, fairness, and inclusiveness in the knowledge construction (Chilisa, 2005). In response to this Indigenous standpoint perspective, Krippendorff (2004, 2005) advocates that HCD should be operated by an active agent rather than as a "problem solver" or "community saviour." Being an active agent means having a commitment to give back to the community and to build harmony as the researchers seek actively to understand the community they are working for.
The above description clarifies that Indigenous standpoint and HCD are not contradictory concepts, and that these concepts can work interchangeably. Indigenous standpoint mainly argues that work and dialogue in Indigenous settings must be carried out in a way that is ethically appropriate and respectful from the viewpoint of Indigenous people. While Indigenous standpoint is a guide to approaching Indigenous communities and to understanding Indigenous ways of knowing and culture, HCD offers a standpoint for a design process platform that upholds Indigenous representation, voices, views, and creation. As Minniecon et al. suggest, amalgamation of the Indigenous standpoint with another discipline may lead to more ethical, collaborative, and sustainable engagement with Indigenous peoples (D Minniecon et al., 2007). Setting Indigenous ways of knowing

at the centre of Indigenous related research will mostly lead to solutions and discoveries to solve problems encountered by Indigenous people (Iddy, 2021).

Dayak health is set as the context at the centre of this amalgamation of Indigenous and HCD approaches. To date, Indigenous health is still largely absent in both HCD studies and in design studies and research, particularly in Indonesia. However, as noted above, previous studies from health-related disciplines have adopted HCD in designing health material in a culturally sensitive matter with a great effort to avoid misrepresentation of the researched communities (*see* Adam et al., 2019; Isler et al., 2019). Thus, including related works from health research will inform the interplay between the context and the approaches of the current research.

I contextualise this study by considering Indigenous approaches alongside Human-Centred Design (HCD) to explore the Dayak Indigenous context. While I have elaborated on the theoretical underpinnings of this study earlier, here, I briefly revisit Martin Nakata's critical work in this discourse. Nakata (2007) examines the intersection of Indigenous knowledge systems with Western frameworks and the complexities that arise when these systems are integrated into contemporary contexts, such as educational systems. Nakata introduces the concept of the cultural interface, where Indigenous knowledge and Western systems collide, creating a contested space where both epistemologies must navigate differences in how knowledge is understood and applied (Nakata, 2007, p. 9). This intersection is seen not just as a point of conflict but as a dynamic space where Indigenous voices are asserting their own narratives and contributions within global knowledge discourses. The consideration of Indigenous standpoint theory and HCD in this study could be seen as the cultural interface, where I attempt to amplify Indigenous Dayak voices in this intersection. By doing so, it aims to build the pathways Nakata suggests for Indigenous communities to reclaim autonomy in shaping their futures in ways that respect their knowledge systems.

2.5.2 On design intentionality

As I explore the nuances of flexibility associated with the notion of localised design intention in section 2.3, it becomes clear that acknowledging and incorporating the local community's feedback is not only a strategic move but a fundamental one. The transition from merely designing for a community to designing with a community marks a significant shift in the design approach discussed in the earlier section. Specifically, this shift underpins the discussions where the focus pivots to the localised design intention that are integral to local standpoints alongside HCD approaches. Interpreting these local intentions could ensure that the subsequent designs are not only adaptable and sustainable but also deeply rooted in the cultural and practical realities of the local community. This approach not only respects but prioritises the voices of the local community members, ensuring that their input drives the health development process and that the resultant solutions are more aligned with their actual needs and conditions. It sets the stage for a more detailed discussion on how localised design intention can fundamentally reshape the design landscape, shifting the focus from designer-led approaches to truly community-engaged ones.

2.5.3 On methodological approach

My methodological approach focuses on being sensitive, aware, and culturally appropriate. While I describe my approach centred on ethnographic sensibility, I will mix this method with local approach and design vocabularies.

As I have described previously, I employed qualitative fieldwork with a set of methods, including observation, interviews, design workshops, textual analysis, and visual methods, each meticulously chosen to enhance the depth and breadth of the contextual inquiry. This approach provides a way of looking and a way of listening for Dayak voices that takes cultural interpretation as its main purpose (Wolcott, 1999), mingling design studies, Indigenous health, and local knowledge.

Dayak language and Indonesian language are rich with meaning significant to this research; therefore I mix such local terms and English in my writing. Through such expression, I give a voice to this locality and value their cultural richness. I set up the language for the method, such as kebersamaan participant observation and pe' siu interviews, to reconnect with the local people. Previous research has celebrated local terms beautifully by remixing localising terms both in method description and analysis in the local Java context (*see* Crosby, 2013, p. 14).

In addition, the workshop is a critical space for this research's collaboration with Dayak people. The Dayak storytelling collaborative workshop celebrates local value to increase trust, deepen engagement, and offer greater mutual insights in a respectful way. Acknowledging that design methods in design process are always necessarily political (Barcham, 2021), at least between the West and the global South, this methodological approach describes the potential remix role that local design methodologies—such as kebersamaan observation participation, pe' siu interview, and Dayak collaborative story-telling—may play in guiding new forms of design. This methodological approach/interpretative turn offers a culturally sensitive way to answer my research question on the HCD and indigenous standpoint in Dayak health. It strongly emphasises the cultural context and local value in approaching this topic.

2.5.4 Conclusion

In this chapter, I have outlined the conceptual–theoretical and methodological steps that respond to my research question by addressing the interplay between human centredness and the Indigenous standpoint in Dayak health via localised design intention, a sensitive, flexible method to accommodate Indigenous/local voices. This approach enables a dialogical engagement with the richness of the local knowledge perspective and local collaboration, centering HCD within the cultural value of health and well-being. In addition, it places local people's voices as the centre of current and future discussion, a critical shift in research perspective.

The theoretical and methodological approaches explored in this writing—based on a reflective and respectful engagement with a different body of knowledge in the literature—create a space for discourse, orienting the design research and practice within this inquiry. While the approaches present in the current work will not necessarily settle the tensions between the different worlds that exist, through this research agenda, it will hopefully build up the possibility of a space where the unheard voices can be heard and will go through facing the future together.

Kebersamaan[2] with Kader Posyandu

One of my participant observation activities in Long Lanuk involved assisting Posyandu[3] program with the weighing of children who attended Posyandu activities at the Sub-Community Health Centre, Long Lanuk. All Kader Posyandu are married women, each with her specific responsibilities, including weighing, record-keeping, and food preparation for the children. My attention was often divided between the cries of children who were reluctant to be weighed and the chattering of Kader Posyandu, who sometimes conversed in a non-standard mixture of Indonesian and the Berau regional language, which I understood, and occasionally using Dayak, which I did not comprehend.

The weighing area for the children was situated on the terrace, and it became congested as residents arrived. My role involved placing the child onto the hanging scales and recording their weight. I was accompanied by one of the moms, Posyandu Kader, Mama Jep, responsible for documenting the names and weights of the children. The procedure was straightforward: Mama Jep would point to the child, I would lift and position the child on the scale, coaxing them to remain still, and then I would check the weight and call out to Mama Jeb, for instance, "10 kilos, Mama Jeb."

The health worker team from the Puskesmas (Community Health Centre) came when I had almost completed weighing the children. The recorded weights were documented in the health book provided to each child. I recall a moment when a health worker called the mother of one of the children I was weighing. The health worker expressed concern about the child's declining weight and lack of height gain. I overheard the health worker inquire about the child's diet and advise the mother to pay attention to the child's nutritional intake. During the consultation, several other mothers who were listening to expressed concerns, saying, "Duh, my child only wants to eat *Indomie*, how can he grow up?"

Following the Posyandu activities, the food left over after distribution to the children typically became the Kader Posyandu's portion, and I also received a share. During these moments of sitting and eating together, along with the simple tasks I carried out, I socialised and forged friendships with the moms of Long Lanuk village. I listened to their stories about failed harvests in their gardens, the dust in their homes (attributed to mining, they said), their children, and even their concerns about weight. Here, I witnessed and experienced hospitality intertwined with resilience in the face of life's limitations in a remote area close to mining and oil palm plantations.

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[2] Togetherness

[3] Pos Layanan Terpadu (Integrated Service Post)

CHAPTER 3 KEBERSAMAAN WITHIN CENTRALISED HEALTH SYSTEMS

Drawing upon seven months of research fieldwork framed by the local term kebersamaan (togetherness, which means living together in the community) and involving participant observation, this chapter presents three cases of health systems-related delivery programs implemented in local communities during this timeframe. The first case involves a fogging activity aimed at combating malaria. The second explores Posyandu, a regular community health program designed to address child malnutrition and promote children's health. The final case explores the use of visual aids, including health-related posters, in this community. These cases incorporate numerous photographs taken during the fieldwork to elucidate the circumstances surrounding local health design systems. Reporting on these cases is crucial, as they constitute critical elements for the health of local people. These cases reveal that the community still lacks the resources needed to support local health in rural areas and that local voices are often excluded in health system design. However, despite the challenges and difficulties inherent in these health systems, local people manage to progress by leveraging kebersamaan. This chapter advocates for allocating time and resources to understand local conditions when designing health systems aimed at delivering health services and programs in the community. It contends that incorporating local standpoint is crucial in collaborating with the community to create health systems that are not only more accessible but also more representative of their needs. Additionally, the chapter discusses its contribution to design research by providing a repertoire for documentation, which so far is non-existent within this research context and field of inquiry.

3.1 Introduction

Exploring local health situations necessarily involves taking account of the existing health system that encompasses the local community. Practitioners, designers, and researchers sometimes overlook this aspect in a hurry to produce a product for the community's design system, which results in a lack of understanding of the local context in

the health design system. This leads to health disparities and ineffective health services for local people. Having been born and raised in this region, I have directly experienced the joys and sorrows of living under this health system. This chapter, through the lens of Indigenous approaches and design, asks: What circumstances emerge from the currently designated health systems in local communities, and how can these circumstances be analysed and understood from an Indigenous standpoint alongside a HCD perspective? This chapter responds to this question by exploring the circumstances resulting from current designated health systems in three case studies. These cases offer distinct yet complementary ways of illuminating local people's health in rural areas. The cases show that the notion of kebersamaan (togetherness) plays a pivotal role in navigating life under health systems, complementing this inquiry's understandings of the local standpoint in relation to human-centred design problems.

Below, I first explain the concept of kebersamaan in the local context. Then, I outline how observation contextualises this work. After that, I provide an overview of the context of this study, highlighting the sub-community health centre, before responding to research questions through three case studies. I then discuss the findings in relation to my study approaches to determine whether they are interconnected. Finally, I outline the implications of this study for an agenda based on an amalgamation of Indigenous standpoints and HCD, considering both knowledge-based and practical perspectives.

3.2 Kebersamaan

Kebersamaan or togetherness is a fundamental aspect of social life in Indonesia, particularly within the Dayak communities of East Kalimantan. This principle is deeply embedded in the Dayak's cultural fabric and reflects a communal identity that emphasises mutual assistance, collective participation, and shared responsibility. According to Avé and King (1986), Dayak societies are traditionally organised around communal houses known as 'longhouses', where large extended families live under one roof in a physically and socially integrated space. This living arrangement fosters a strong sense of

community and togetherness, as daily life, religious ceremonies, and decision-making processes are conducted collectively. The longhouse is not just a dwelling but also a manifestation of the community's life, where the values of cooperation and mutual respect are lived out daily.

Further exploring the nuances of kebersamaan, Sellato (1994) highlights how this concept extends beyond architectural communalism to influence Dayak governance and social organisation. Dayak communities are known for their egalitarian structures, where leadership is often fluid and based on consensus rather than hierarchy. This arrangement reflects their broader cultural orientation towards kebersamaan, where community well-being is prioritised over individual gain. Practically, this means that decision-making processes are inclusive, involving discussions that accommodate diverse viewpoints and seek to achieve consensus reflecting the community's collective will. This system of governance not only strengthens communal bonds but also ensures that the actions and intentions of the community align with the well-being of all its members.

The principle of kebersamaan also profoundly influences Dayak ceremonial practices, which are pivotal in reinforcing community bonds through shared rituals and collective cultural expressions. Ceremonies such as the Gawai Dayak involve elaborate preparations and rituals in which everyone participates, emphasising unity and the renewal of social ties. These ceremonies not only celebrate cultural heritage but also reaffirm the values of togetherness, mutual respect, and communal responsibility. The performance of these rituals provides a space for transmitting these values to younger generations, ensuring the continuity of community cohesion and the spirit of kebersamaan.

Therefore, kebersamaan in the Dayak communities of East Kalimantan is a multifaceted concept manifesting in their residential architecture, social organisation, and ceremonial practices. It underpins the Dayak communal ethos, promoting a way of life that prioritises collective well-being and communal harmony. This principle of togetherness not

only defines the social dynamics of the Dayak but also offers a model of communal living that can provide insights into sustainable and equitable social structures. In this study, I use kebersamaan as a way to learn and see the social circumstances while living under health systems in this local community.

3.3 Observation with Visual Methods

In design research, the field is a place to study the phenomenon in its context. As Koskinen et al. state, the field is where design researchers are interested in 'how people and communities understand things around designs, make sense of them, talk about them, and live with them' (Koskinen et al., 2011, p. 69). In this study, I draw inspiration from the sensibilities of design ethnography in my approach to the field. An ethnographic field site is a 'place where we connect with organisations, institutions, people, and things as research, experimentation, and intervention are practiced' (Pink et al., 2022, p. 11). Drawing on insights from (Koskinen et al., 2011) and (Pink et al., 2022), I employ observation to explore visually, establish connections, and acquire knowledge about the field. This allows me to learn about and understand the field, not only through observation but also by connecting with the field and its people. Additionally, it enables me to grasp the interaction between HCD and local knowledge within the local health context.

Indigenous researcher Danièle Hromek discusses an issue with anthropology when it comes to studying Indigenous people. Anthropology, as a discipline, heavily relies on Western and Eurocentric epistemologies (Hromek, 2019, n. See Hromek Chapter 4, *The Problem With Anthropology*). This study draws inspiration from ethnography (a branch of anthropology) (Risjord, 2007; Sinanan & McDonald, 2017; Zaharlick, 1992), but the observation is rooted in the perspective of design research informed by Indigenous approaches. It places the Indigenous standpoint at its core, listening to their knowledge, ways of being, and values. Thus, the study aims to connect meaningfully with local Indigenous communities, coexist harmoniously with them, and uphold principles of respect, learning, understanding, and collaboration. Using an Indigenous standpoint as a

research lens in Indigenous communities means supporting the Indigenous research agenda, which promotes culturally safe, responsive, and respectful research, emphasising culturally specific Indigenous ways of knowing (Ntseane, 2011; Stoffer, 2017).

Furthermore, observation holds a central place in HCD research; HCD researchers and practitioners often designate it as the initial step in the design investigation process. I do not view HCD merely as a tool for studying and comprehending people's needs or for managing and guiding product development. Rather, HCD represents a collaborative process of learning and creation, not only enabling people's influence but also allowing the environment to shape research and design. Thus, observing people and their surroundings in their natural context is imperative to gaining insight and understanding.

Hence, in this study, I have incorporated visual observation with photography to explore the world, gain insights, and effectively communicate these insights to others (Pink, 2020). In this chapter, I consider visual methods as valuable tools for shedding light on local health issues and groups that might otherwise remain unseen, all the while minding the ethical considerations surrounding the use of visual methods.

3.4 Sub-community Health Centre in Long Lanuk

I stayed in the Dayak traditional village of Long Lanuk, East Kalimantan, from February to August 2023. The Dayak tribe inhabiting Long Lanuk belongs to the Dayak Gaai tribe. They inhabit tropical rainforest regions and are surrounded by the Nyapas mountains. Long Lanuk stands as the farthest village in Sambaliung district, approximately a two-hour drive from the district city centre. The route remains unpaved, consisting of dirt or gravel roads.

In Indonesia, village health services are provided through Puskesmas rather than hospitals. The Community Health Centre (Puskesmas) serves as a health facility striving to coordinate community health initiatives and primary-level individual care. Puskesmas prioritises promotional and preventive efforts to achieve optimal public health status.

These health endeavours are executed by directing attention towards services for the broader community, aiming to attain optimum health status without overlooking the quality of care for individuals. A Puskesmas head accountable to the Regency Department of Health office oversees the Puskesmas.

As a health facility, Puskesmas has developed for more than 40 years in Indonesia. The year 1968 marked a significant development for Puskesmas. Since the 1970s, one Puskesmas has been established in each subdistrict or any area with 30,000 to 50,000 residents. Initially, the government pledged to ensure that every Puskesmas was staffed with medical doctors. Subsequently, in 1979, the network expanded by introducing auxiliary Puskesmas at the village level, referred to as Puskesmas Pembantu or Pustu (Trisnantoro et al., 2012).

According to the Department of Health categorisation, Long Lanuk is classified as a remote rural village; it faces challenges in accessing healthcare services based on established criteria. Residents of Long Lanuk must travel for hours to reach Puskesmas in the Sambaliung District. Consequently, the Department of Health office took the initiative of establishing the *Pustu* (Puskesmas Pembantu, or Sub-Community Health Centre) in Long Lanuk. A Sub-Community Health Centre (Pustu) is an essential component of the health centre service network, providing ongoing healthcare services within the health centre's designated area. Pustu is closely linked to Puskesmas and requires periodic support from the health centre. The primary objective of the Pustu is to expand the reach and enhance the quality of healthcare services available to the community within its operational vicinity. Pustu Long Lanuk is currently housed in a newly constructed building nearing completion. Despite being in the final stages of construction, Pustu Long Lanuk is fully operational, providing essential healthcare services to the residents of Long Lanuk. A registered nurse and a midwife staff Pustu Long Lanuk, catering to the healthcare needs of the 907 residents of Kampung Long Lanuk village.

As a health facility, Pustu Long Lanuk serves as a central infrastructure providing health services and activities to the local people. Pustu Long Lanuk is often used as a meeting point for health workers before they make health inspections around the village. Pustu Long Lanuk has no medical doctor; instead, a nurse provides daily health services to patients or local people seeking medical assistance in the village.

3.5 Case Studies

The three case studies presented in this chapter were selected to spotlight the health conditions in the remote rural areas of East Kalimantan. These cases were not chosen arbitrarily; rather, they exemplify a thorough engagement during my stay in this community, providing first-hand observational accounts that enhance the collected empirical data. The first case study delves into fogging activities aimed at eradicating malaria-carrying mosquitoes. Beyond merely describing these activities, this study probes into the background and the broader implications of such initiatives. The second case relates to the operations of Integrated Service Posts (Posyandu), which play a crucial role in delivering health services to mothers and children, as well as in combating malnutrition. This program is foundational to Indonesia's initiatives to ameliorate maternal and child health indices. The third case study examines visual aid use in community health promotion and education, which should bridge the communication gap between health workers and village residents so that complex health information can be accessed and understood. These case studies are elucidated through narratives accompanied by a series of photographs that document the genuine living conditions under current health systems. These images not only complement the textual data visually but also serve as poignant, standalone attestations to the everyday realities of public health. By articulating these case studies through detailed narratives and photographic substantiation, this report endeavours to provide a comprehensive panorama of the health landscape in rural East Kalimantan.

3.5.1 Case 1: Fogging

East Kalimantan, being a developing region with a tropical and sub-tropical climate, serves as an ideal habitat for malaria and dengue mosquitoes, which can infect individuals of all age groups. Various factors encompassing the physical, chemical, biological, and social environment, as well as human behaviour, influence the rising incidence of malaria (Sucipto, 2015). The persistent issues of malaria and dengue fever in Indonesia are closely linked to the breeding grounds for disease-carrying mosquitoes, as well as the hard-to-access locations. Additionally, the subpar condition of residential environments, marked by inadequate ventilation, ceilings, and walls, further exacerbates the problem (Darmawansyah et al., 2019). Community behaviour, environmental cleanliness, and socio-economic factors compound these challenges.

According to local media reports, the incidence of malaria is rising in Berau, East Kalimantan. In 2022, more than 278 cases were reported, increasing to over 300 cases in 2023 (prokal.co, 2023). Mosquito-borne diseases have also extended to Long Lanuk, where one of the residents succumbed to malaria. Following this incident, the Department of Health mandated that healthcare workers conduct fogging, a fumigation process involving the use of insecticides to eradicate mosquitoes.

The widespread use of fogging in Indonesia as an emergency measure to control malaria outbreaks, as reported by Elyazar et al. (2011), indicates its potential efficacy in swiftly reducing adult mosquito populations and, consequently, malaria transmission rates. Indeed, when properly executed, fogging can significantly diminish the prevalence of mosquito vectors within a specific locale, offering a prompt reduction in the spread of disease. However, the effectiveness of this strategy is heavily reliant on its integration into a broader vector management approach. The World Health Organisation (WHO, 2013)) emphasises that fogging should not stand alone but be part of a comprehensive integrated vector management (IVM) strategy. This strategy should encompass source reduction, larviciding, and, crucially, community engagement. These elements ensure

sustainability and effectiveness, addressing the mosquito lifecycle at multiple stages and fostering community practices that inhibit recurrence. The dependence on such comprehensive integration raises concerns about the long-term viability and effectiveness of fogging if implemented in isolation, potentially leading to a temporary reprieve rather than a sustainable solution.

Yet, the challenges to fogging include its temporary effect on mosquito populations, potential health risks to humans due to pesticide exposure, and environmental concerns. Research by Fillinger et al. (Fillinger et al., 2009) indicates that repeated fogging can lead to pesticide resistance in mosquito populations, thus diminishing its long-term efficacy. Additionally, the impact on non-target species and the environment must be considered, necessitating careful management and adherence to safety guidelines to mitigate adverse effects.

Living under the threat of malaria-carrying mosquitoes has become a defining aspect of life in the Dayak community. Daily life is punctuated with precautions: mosquito nets cover the beds, and at night, the air is filled with the smoke of burning medicinal herbs, a traditional method believed to repel mosquitoes. However, limited access to healthcare services and the significant health disparities in this community take their toll. I was informed that a local resident in the Dayak village died from malaria. Subsequently, I was told that local health workers would perform fogging.

Against the sombre backdrop of overcast skies, the village of Long Lanuk initiated a significant and visually striking anti-malaria measure. Residents were ushered out of their homes, a precaution disseminated through loudspeakers that momentarily cut through the morning calm. The subsequent scenes were almost dystopian: streets quickly obscured by dense insecticide fog as depicted vividly in Figure 23 and Figure 24. Fogging, while a common practice in mosquito control, here was enveloped in an aura of urgency and necessity, particularly given the location—a home recently touched by tragedy due to malaria. Despite the apparent thoroughness of the operation, the execution highlighted

critical deficiencies. The enveloping smoke, while effective in reaching the nooks and crannies of village homes, also illustrated a harsh reality; even with protective measures such as masks, the chemical onslaught was nearly unbearable, evidenced by the stinging eyes and choking air that even a bystander like myself experienced from a distance. The physical reactions to the pesticides underscored the invasive nature of the procedure, raising concerns about its impact not only on the mosquitoes but also on the health of the residents post-fogging.

Furthermore, this episode of fogging—my first observed in over six months of residence—unveiled a startling gap in the village's health management strategies. While the immediate response to a malaria case was robust, it was an isolated endeavour rather than part of a sustained and comprehensive public health initiative. The absence of ongoing educational programs on the risks associated with malaria and dengue was a significant oversight. Residents, while temporarily protected from mosquito bites, were left uninformed about the broader spectrum of preventive measures they could adopt or the potential hazards introduced by the chemicals now settling into their living spaces. This lack of information could lead to a false sense of security, or worse, neglect of non-chemical precautions that are essential in the holistic management of vector-borne diseases. The community's engagement in such health-critical activities should ideally be accompanied by continuous education and awareness campaigns, ensuring that the fog does not merely displace the threat of disease but contributes to a well-informed and health-conscious environment.

Fogging in East Kalimantan to combat malaria highlights the immediate benefits of reducing mosquito populations but also raises concerns about the long-term health impact on the local community. While fogging effectively decreases disease vectors, thus potentially lowering malaria transmission rates, chemical exposure poses risks. Residents, often vacating their homes during treatments, might experience respiratory issues or other health effects from insecticide inhalation. Furthermore, its efficacy may wane due to

mosquitoes developing resistance, leading to more aggressive spraying and increased chemical exposure. This situation underscores the need for comprehensive health education and integrated vector management strategies that minimise reliance on chemical controls and focus on sustainable, community-driven solutions. These should include improving housing conditions to prevent mosquito entry, promoting environmental cleanliness to eliminate breeding sites, and enhancing public health infrastructure to manage and mitigate the effects of vector-borne diseases effectively.

Figure 23 Fogging activity was performed in the village neighbourhood to eliminate malaria mosquitoes.
The photo was taken on 20 March 2023 with a mobile phone camera.

Figure 24 Another fogging activity was performed in the village neighbourhood to eliminate malaria mosquitoes.
The photo was taken on 20 March 2023 with a mobile phone camera.

3.5.2 Case 2: Posyandu

Posyandu, an abbreviation for Pusat Layanan Terpadu (Integrated Health and Nutrition Service Centre), is designed to offer essential health services. These services encompass family planning, maternal and child health, nutrition—such as growth monitoring, supplementary feeding, vitamin and mineral supplementation, and nutrition education—immunisation, and disease control (Nazri et al., 2016). As the backbone of Indonesia's strategy to improve maternal and child health in rural areas, Posyandu faces several significant challenges hindering its effectiveness. Primarily, these challenges are resource constraints, inconsistent quality of services provided, and varying levels of community engagement and participation (Schröders et al., 2015). Resource limitations include inadequate supplies and facilities, leading to intermittent service availability and reduced care quality. This inconsistency can be attributed to the voluntary workforce, often leading to gaps in professional healthcare training and expertise (Andriani et al., 2016).

The efficacy of Posyandu services—integral to enhancing community health through regular check-ups and preventative care—is markedly hindered by the geographical isolation of many rural communities. This isolation not only physically impedes access but also, as suggested by Setiawan and Christiani (Setiawan & Christiani, 2018), critically undermines the potential for regular attendance, which is vital for the success of such health initiatives. Further compounding these challenges are the significant community engagement issues rooted in a pervasive lack of awareness and understanding of what Posyandu programs offer, as noted by previous researchers (Cipta et al., 2024). This deficiency in knowledge underscores an urgent need for robust educational outreach that can bridge the information gap and elucidate the benefits of regular health monitoring provided by Posyandu. Additionally, the scenario is aggravated by deep-seated socio-cultural factors that influence health-seeking behaviours, as identified by previous research (Widayanti et al., 2020). These factors include traditional

beliefs and practices that may skew perceptions of modern healthcare services, thus deterring optimal engagement. The interplay of these elements highlights a complex barrier to healthcare access that requires a multifaceted and culturally sensitive approach to enhance the effectiveness of Posyandu services and ensure they fulfill their role in safeguarding rural public health.

Hence, to overcome these challenges, Posyandu mainly relies on volunteers known as 'Kader Posyandu' who operate within the village health posts. These Kader are chosen voluntarily from within the community and are responsible for organising Posyandu activities. Puskesmas, acting as the district representative of the Ministry of Health, trains these Kader Posyandu until they are proficient in delivering the required basic healthcare services. Moreover, the Indonesian Health Ministry Regulation in 2014 mandates medical doctors or midwives from Puskesmas to assist the Kader Posyandu in conducting all activities.

In Long Lanuk, the pivotal role of Kader Posyandu is manifest in their dual function of spearheading fundraising efforts and fostering robust community engagement for the implementation of Posyandu activities. Their proactive approach in encouraging residents to regularly attend Posyandu sessions is critical for the program's sustained impact on public health. This engagement is complemented by monthly visits from health workers from Puskesmas, who deliver a range of health services aimed at improving overall community well-being. During my stay in the village, my active participation in these Posyandu sessions, in collaboration with Kader Posyandu, provided firsthand insight into both the strengths and potential areas for improvement of these health initiatives. Despite the clear benefits brought about by these activities, challenges remain. The reliance on irregular fundraising to support ongoing health activities underscores a vulnerability in the program's financial sustainability. Moreover, while Kader Posyandu effectively mobilises community participation, there remains a significant portion of the population that remains

disengaged, either due to unawareness or apathy towards the benefits of regular health check-ups.

At the end of each month, Kader Posyandu are notified about the Community Health Centre team scheduled to visit the village for routine Posyandu activities. Usually, at 8 a.m., Kader Posyandu gather at the Sub-Community Health Centre to prepare for the Posyandu activities. The health team from the Community Health Centre typically visits several villages before concluding their visit in Long Lanuk, as it is the most distant village in the Sambaliung District. Posyandu activities by the Community Health Centre typically last one hour. Participants in Posyandu activities usually include pregnant women, breastfeeding mothers, and mothers with toddlers. During these Posyandu sessions, the health of mothers and children is monitored, including weight checks (Figure 25) and vaccinations (Figure 26), recording the health (Figure 27) and nutritional consultations for children.

In this community, Posyandu symbolises community togetherness and a grassroots effort to enhance public health. These community-based health posts operate on the principle of active community involvement, which is crucial for their success. Volunteers, often local women, are the backbone of the Posyandu, reflecting a strong communal effort to care for the health of mothers and children (Andriani et al., 2016). The commitment of Posyandu cadres to the health of mothers and children in their communities is closely linked to the pervasive health issues in rural areas, such as stunting and malnutrition. Approximately 30% of Indonesian children under five experience stunted growth, a condition attributed to chronic nutritional deficiencies (Semba et al., 2008). Rural regions, with their limited access to diverse diets and healthcare services, exhibit particularly high rates of these conditions (Bloem et al., 2005). Contributing factors include inadequate maternal nutrition, poor infant feeding practices, and frequent infections from poverty and lack of sanitation (Stewart et al., 2013). Seasonal food shortages and the low socio-economic status of these communities further

exacerbate these conditions, limiting access to quality food and healthcare (Briend et al., 2015).

Figure 25 Measuring and recording body weight of toddlers at a local medical centre.

The photo was taken on 25 March 2023.

Figure 26 A health worker vaccinating a toddler during Posyandu activities.
The photo was taken on 27 May 2023.

Figure 27 Health record book provided by the government and issued to a mother when a baby is born. The mother is expected to carry this book for every visit to Posyandu, as it is used for health recording and monitoring.
The photo was taken on 29 April 2023.

During my involvement with Posyandu activities, fathers rarely accompanied their children or wives to the sessions because they were engaged in agricultural work, as frequently mentioned by the mothers. Participation in childcare during Posyandu meetings, which predominantly become a social hub for mothers, is gender-specific. These gatherings not only facilitate vital health services but also serve as a community space where mothers exchange gossip, nutritional guidance, beauty tips, and other health-related information.

The Posyandu health worker team, usually consisting of three members from the Community Health Centre, plays a critical role in delivering maternal and child health services across multiple villages in a single day. Their extensive travel from district cities to remote villages such as Long Lanuk in Kalimantan often causes fatigue, which is visible on their faces. These journeys, combined with the scheduling of Posyandu sessions exclusively on Saturdays, complicate the provision of healthcare services in these rural settings. This logistical challenge underscores the dedication required to maintain health service delivery in less accessible areas.

3.5.3 Case 3 Visual aids

In this case, in the context of enhancing health literacy and promoting public health education, the term 'visual aids' (VA) is comprehensively defined to encompass a broad spectrum of non-moving imagery designed to supplement verbal or written information. This definition extends beyond the conventional understanding of visual aids as mere graphical representations of data, such as icon arrays, bar graphs, and line graphs, as posited by Garcia-Retamero and Cokely (Garcia-Retamero & Cokely, 2013, p. 393). It also embraces a wider variety of formats as detailed by Hafner et al. i(Hafner et al., 2022, p. 1), including photographs, illustrations, drawings, infographics, and pictograms. These tools are instrumental in breaking down complex medical and health-related information into digestible, accessible visuals, thereby aiding comprehension across diverse demographic groups. The inclusive definition recognises the pivotal role these visual

elements play in conveying statistical data and in making abstract or dense medical knowledge more tangible and relatable to the general populace. The strategic use of such visual aids can significantly enhance understanding and retention of health information, ultimately fostering better health behaviours and decision-making among individuals. The visual aids have an essential function in public health communication strategies. This holistic approach to health education integrates visual learning to cater to varying literacy levels and learning preferences.

While previous studies have extensively examined the process of creating and validating visual aids, including research on their role in communicating health risks (Garcia-Retamero & Cokely, 2013) and their use as a tool for health education and healthcare narratives (Osborne, 2006), this study focuses specifically on the role of visual aids in rural and remote areas. Documenting the existing visual aids within the context of developing societies, the study's aim is to raise awareness among health communication practitioners, healthcare workers, and designers about the challenging conditions surrounding visual aids in rural and developing communities. These conditions significantly differ from those in developed communities due to limited resources, infrastructure, and lower levels of health literacy.

The first visual artifact (VA) that captured my interest within the local health centre was a poster, as depicted in Figure 28, which promotes Posyandu services. This poster, while ostensibly designed to disseminate vital information about breastfeeding for infants, reveals critical lapses in cultural and contextual appropriateness. Notably, the imagery used fails to reflect the local community, instead featuring celebrity couples and actors from Jakarta, the capital city. This choice of imagery could create a disconnect between the intended message and the local populace, as the figures portrayed might not resonate culturally or socially with the rural residents. Furthermore, both posters showed signs of wear and fading, which not only suggests neglect in maintaining essential health communication materials but also reflects the outdated nature of the information

presented. These official materials from the Department of Health were installed over a decade ago, suggesting that their effectiveness in engaging and educating the local community today is likely to be much diminished. This situation highlights a broader issue in public health communications, where relevance and relatability are crucial for the intended impact, yet often overlooked in the production and maintenance of informational artifacts.

Figure 29 features a banner which serves as an invitation to participate in Posyandu activities, prominently displayed within the health service room. This addition, informing the community about health activities scheduled for August 2022, marks the latest effort to engage local residents in vital health initiatives. However, the inclusion of a photograph of a Western baby on the banner raises questions about cultural relevance and appropriateness in a presumably non-Western context. This choice could alienate the local demographic it aims to serve by not reflecting the community's ethnic or cultural identities. Furthermore, the placement of this banner over an existing one may indicate a lack of space for such communications or a hierarchical approach to information dissemination, where newer messages obscure older, yet potentially still relevant, information. This practice could inadvertently communicate a disregard for the continuity and the historical context of health communications within the community, complicating the reception of new information and possibly undermining the effectiveness of these health campaigns.

Observation of the healthcare area revealed that the walls were sporadically adorned with posters, insecurely attached with adhesive tape and lacking any coherent organisational schema. These posters, dense with information on infant and child health, seem to serve as impromptu educational tools rather than curated displays. Notably, a poster bearing the slogan 'KENALI GIZI BURUK' (Figure 30) catches the eye; it features a distressing sequence of images depicting malnourished children, validated by the Department of Health emblem, thus affirming its official role in health service

communication. While the poster aims to educate on the signs of malnutrition through stark, genuine photographs, it raises profound ethical concerns. The use of real-life images of suffering children, particularly those who are vulnerable and ill, to illustrate health issues warrants scrutiny. Such practices may infringe on the privacy and dignity of the subjects portrayed, exploiting their conditions for educational purposes. This method of visual representation calls for a critical evaluation of the balance between the necessity for public health education and the rights and respect due to individual patients, especially minors in compromised health states.

Figure 28 An old, dull, and outdated poster encouraging regular attendance at Posyandu health services and emphasising the importance of breastfeeding for infants.
The photo was taken on 7 April 2023.

Figure 29 Banner containing an invitation to participate in Posyandu activities.
The photo was taken on 26 May 2023.

Figure 30 A visual aid containing information on infant health and malnutrition in infants. The wall of a health clinic is being used as a notice board for various health communications.
The photo was taken on 7 April 2023.

Figure 31 Simple and straightforward posters promoting health, displayed on the wall of the patient room at Pustu.
The photo was taken on 12 April 2023.

Figure 32 Four visually informative A4-sized infographics displayed in the patient consulting room at Pustu. However, due to its small size, the information on this visual aid is difficult to read.
The photo was taken on 12 April 2023.

Figure 33 The newest poster at Pustu, posted near the entrance, reminding individuals to wear masks and practice hand hygiene.
The photo was taken on 18 May 2023.

Figure 34 Health workers from the Sambaliung Health Centre visited Long Lanuk Pustu to provide information to pregnant women.
The photo was taken on 26 May 2023.

The walls of the consultation room at Pustu Long Lanuk, as depicted in Figure 30, are adorned with posters that provide information on blood sugar, hypertension, gout, and cholesterol. These posters, created through digital designs and printed by healthcare personnel using standard printers, illustrate a pragmatic approach to health education in resource-constrained settings. However, the method of production and dissemination of these posters reveals significant logistical and infrastructural inadequacies. The absence of a dedicated printer at the health centre compels village health workers to rely on external facilities, such as the village head's office, to meet their printing needs. This dependency complicates the timely updating and distribution of vital health information and raises concerns about the sustainability and efficiency of health communication practices in such rural settings. The use of standard printers for producing health posters, while resourceful, may impact the durability and professional appearance of these important educational tools, affecting their effectiveness and the public's perception of their credibility. This situation indicates the urgent need for improved infrastructure and resources in rural health centres to enhance the quality and accessibility of health information dissemination.

Figure 32 has four posters. Information about the characteristics of low and high blood sugar is presented in the top-left poster. The middle poster reads “Gout Disease” and contains signs of gout in the legs. The top-right poster has the headline “*6 Ciri-Ciri Fisik Kolesterol Kamu Tinggi*” (translation: 6 Physical Characteristics of Your High Cholesterol). These three posters do not contain any information about their sources. This omission raises concerns about the reliability and verifiability of the content presented, potentially undermining the educational objective and the trust of the audience in the provided information. Meanwhile, the fourth poster at the bottom (Figure 32), which reads “*Tips Sehat Konsumsi Gula, Garam, & Lemak yang* Aman” (Translation: Healthy Tips for Safe Consumption of Sugar, Salt & Fat), is clearly identified as an official release from the Department of Health's social media channels, lending it a greater degree of credibility.

Moreover, in Figure 33, the poster that reads "*KAWASAN WAJIB PAKAI MASKER SERING CUCI TANGAN PAKAI SABUN*" (translation: Wear a Mask and Wash Your Hands with Soap) is also an official publication, which likely enhances its authoritative impact and compliance among the public. This discrepancy in source attribution between the posters not only reflects inconsistent health communication practices but also highlights the need for stringent standards in health information dissemination to ensure all materials are both authoritative and trustworthy.

During my observations at the Long Lanuk Sub-Community Health Centre, there was a notable absence of digital media technologies, particularly during a presentation on pregnancy health. The health workers relied solely on A3-sized printed materials as their primary educational tools. These visual aids, while functionally useful, could not fully substitute for the comprehensive, dynamic engagement that digital technologies like projectors and computers might offer. This gap is highlighted by the limited distribution of complete visual aids, constrained by resource availability, as depicted in Figure 34. The lack of digital infrastructure not only restricts the scope of information dissemination but also potentially impacts the effectiveness of the learning experience for pregnant women, some of whom resorted to taking notes in the absence of take-home materials. Others merely listened, possibly missing out on critical details not adequately covered by the static printed materials. This scenario underscores a significant deficiency in healthcare education, where the integration of digital tools could enhance informational depth and accessibility, thereby improving health literacy and outcomes for community members.

3.6 Discussion

The Indigenous Dayak Long Lanuk village serves as the primary focus of this study, allowing me to delve into the existing design products and health activities. Within this village, the Pustu Long Lanuk holds a central position as the place where I established significant connections with individuals, institutions, and various aspects of life. Through my observations in this field, I gained the opportunity to immerse myself in

the Dayak village, where I uncovered local health issues and design elements. Without this on-site access, the act of coming to the field, engaging in observations, and learning about Dayak health and design would pose a considerable challenge. Below, I elaborate on the discussion of insights from my observations.

3.6.1 The intricacies of local health

In this section, I will discuss the three health-related case studies in the Dayak Long Lanuk village that have been presented above. Case 1 related to malaria fogging, which significantly threatens the Dayak Indigenous community. In a broader context, Indigenous populations worldwide are particularly susceptible to the perils of malaria and dengue mosquitoes. For instance, the Yanomami Indigenous people in Brazil have witnessed a surge in malaria cases (Castro & Peterka, 2023). Notably, Indigenous Yanomami and Indigenous Dayak Long Lanuk share the same circumstances. The Yanomami people coexist with artisanal mining sites, similar to the situation in Long Lanuk, which is adjacent to coal-mining areas. These mining zones deforest regions inhabited by Indigenous communities, which is a leading cause of malaria outbreaks among these populations (Castro & Peterka, 2023; de Aguiar Barros et al., 2022; Guerra et al., 2006; Yasuoka & Levins, 2007).

Thus, the malaria issue is one of the wicked problems affecting Indigenous Dayak communities. In addressing prevention, it is essential to listen to Dayak voices and consider their perspectives as guiding principles in addressing this problem. In the realm of the design field, previous researchers have applied HCD approaches to tackle the malaria issue in Guyana, emphasising collaborative efforts between institutions in malaria prevention (Yan et al., 2021). Regrettably, in Indonesia, malaria prevention has predominantly focused on fogging (Buraena & Soebijakto, 1994; Ishak et al., 2020; Wahid et al., 2019). Innovative preventive measures, such as systemic prevention through the repeal of legislation facilitating deforestation and mining expansion (factors contributing to malaria) or the establishment of a network of community health agents for malaria

monitoring and surveillance, as researchers suggested (Castro & Peterka, 2023), have yet to be proposed. Additionally, there are no design-related products in relation to the malaria issue, though this issue has threatened local health.

The primary objective of Posyandu in Case 2 is to provide preventive and health promotion services. Previous researchers have identified shortcomings in Posyandu services related to infrastructure, participation, and collaboration (Suparto et al., 2022). In Long Lanuk, despite limited infrastructure, the Dayak community actively participates in Posyandu and is open to collaboration. However, health promotion services through Posyandu in Long Lanuk are still deficient. It is worth noting that health promotion can serve as a valuable tool in addressing stunting in East Kalimantan, which currently has a stunting rate of 20 per cent, ranking fourth among regions with the highest stunting rates in Indonesia. Additionally, the Posyandu program includes preventive and health promotion initiatives for the elderly. Unfortunately, this program is not consistently delivered and tends to be marginalised, a situation that mirrors the broader context in Indonesia (Kadar et al., 2013).

Case 3 reveals that Pustu Long Lanuk is currently lacking in basic visual aids. Previous studies have emphasised the significance of visual aids in developing communities (Hafner et al., 2022), particularly where illiteracy rates are high (Ngoh & Shepherd, 1997; Shabiralyani et al., 2015; Thapar, 1959). The Pustu serves as the primary hub for village residents to access health-related information. This healthcare facility is also the sole source for obtaining design products incorporating health agendas implemented by regional and national governments. Throughout my observation period and my stay of over six months in Long Lanuk Village, these VA products containing health information were neither distributed nor shared via print media, nor were there any replacements or updates to the health information posters affixed to the walls.

In contrast to health service centres in cities that possess electronic media for displaying digital designs containing health information, health centres in remote areas

lack the infrastructure required to integrate digital design and health information. Pustu Long Lanuk lacks TV facilities, screens, or monitors that could be used as media for showcasing health information, such as digital posters. The absence of technological media hinders the dissemination of the latest VA in the absence of printed designs.

The findings reveal the dearth of Indigenous or local voices and representation in this VA product. Among the posters and flyers affixed to the walls, no photographs or visuals depict the Dayak tribe, nor do they contain information specifically acknowledging the knowledge of the Dayak community. Generally, the posters and leaflets appear to be templates procured from a central source, namely the Department of Health, or from Google search engine results.These aspects are at odds with previous studies, which consistently argue that when addressing Indigenous health, it is imperative to consider individuals' cultural context (Campbell et al., 1999; Kreuter & McClure, 2004).

The use of VAs facilitates the dissemination of ideas and information and has been employed across diverse sectors to surmount language barriers and effectively convey valuable information. In healthcare, the VA is a potent tool for communication. For instance, in medical consultations, conveying health information orally without visual aids often results in patients not fully grasping the content (Kessels, 2003). Earlier research by (Houts et al., 2006) centred on the use of images to augment comprehension, attention, and information recall. Consequently, several studies have delved into the creation and deployment of visual communication in health promotion and education (Barros et al., 2014; Hafner et al., 2022; Katz et al., 2006). Nonetheless, the utilisation of visual materials to convey health and well-being information in East Kalimantan remains unexplored, particularly in remote areas such as Long Lanuk village. Visual communication tools can aid in conveying health information and hold particular significance for engaging with local communities characterised by distinct languages and varying levels of health literacy.

So, the three cases of malaria management through fogging, community-based Posyandu programs, and the utilisation of visual aids in Pustu Long Lanuk, reveal a

complex interplay of environmental, infrastructural, and cultural factors that influence health outcomes under current health systems. These studies illustrate the importance of embracing local knowledge and Indigenous methods alongside modern health strategies to create effective, sustainable solutions tailored to the unique needs of the Dayak community. Furthermore, the adaptation of HCD approaches in these interventions could significantly enhance their effectiveness by ensuring that they are more aligned with the local context and are culturally sensitive. This approach will not only support better health outcomes but also foster a sense of ownership and empowerment among the Dayak people, ultimately leading to more resilient and self-sustaining health systems. As we move forward, health interventions in Indigenous and remote areas must prioritise the integration of local voices and perspectives, leveraging both traditional practices and contemporary health strategies to address the unique challenges these communities face.

3.6.2 View of kebersamaan

Through my kebersamaan observations, I could delve into the life of the Dayak village, where I uncovered local health issues as detailed above. It is crucial to emphasise that without this direct access, the chance to live and stay with the Dayak community, such direct observation would never have occurred. These observations are a vital element in directly learning about and documenting the health of the local community. From this experience of living among them, I could see the role of the concept of 'togetherness' within the community. A clear example is their unity in strengthening community health through active participation in Posyandu.

In their shared culture of togetherness, the local community accepted my living among them. Alongside them, I experienced concerns about the threat of malaria, volunteered in Posyandu activities, and observed visual aids that seemingly do not reflect the local community. Observations grounded in visual methods and wrapped in a local perspective of togetherness, although not revealing unity, were an effective method to

observe at first hand the living conditions of the local community under the existing health system.

The three case studies above, unfortunately, show that togetherness is absent in the infrastructure's efforts to design local health programs related to health promotion and education. The existing health system does not involve the community in structured efforts to combat malaria. The local community is not involved in the process of creating visual aids, so the final output of the existing visual aids does not represent the local community in terms of identity, ideas, or knowledge. Yet, the concept of togetherness can be a significant element that helps strengthen local health, as implemented in Posyandu.

3.6.3 Implications

The implications are manifold: First, health interventions need to be both contextually adapted and co-created with the communities they intend to serve. This approach ensures that culturally sensitive solutions are more readily embraced by the community. Second, this chapter underscores the importance of enhancing the infrastructure to support these health systems, such as improving the availability of relevant visual aids that resonate with local experiences and languages. Additionally, the findings point towards the necessity for continuous engagement and training of local health volunteers to ensure the sustainability and effectiveness of health programs such as Posyandu.

Moreover, the cases studied suggest that integrating HCD principles can significantly bridge the gap between existing health services and the actual needs of the Dayak people. By focusing on local insights and leveraging Indigenous knowledge, health systems can evolve to be more than just functional; they can become empowering platforms that reinforce community solidarity and resilience. Lastly, this work contributes to the broader discourse on the need for a paradigm shift in designing and implementing health interventions in remote and Indigenous areas, advocating for a bottom-up approach that prioritises local voices and wisdom in the fight against health disparities. This study

calls for a strategic realignment of health policies to support these integrative and culturally informed health practices crucial for the well-being of the Dayak and similar communities.

3.6.4 Conclusion

The research conducted in the Dayak Long Lanuk village encapsulates the essence of exploration Indigenous perspectives and HCD into local health systems. Over seven months of immersive fieldwork, this study not only documented the prevailing health challenges but also highlighted the profound potential of kebersamaan—or communal unity—in enhancing health outcomes. On examining the implementation of fogging activities, Posyandu programs, and the use of visual aids, aligning health interventions with local cultural practices and community insights is evidently not merely beneficial but essential. This alignment fosters greater community acceptance and effectiveness of health programs. The findings advocate for a more nuanced approach to health system design—one extending beyond traditional methods to embrace the complexities of local contexts. This approach should incorporate ongoing dialogue with community members, leverage local knowledge, and adapt interventions to meet the specific needs and circumstances of the community. Integrating such culturally informed and participatory strategies is a crucial step to overcoming the entrenched health disparities faced by Indigenous populations such as the Dayak of Long Lanuk. This study sets a precedent for future health initiatives aiming to transform passive healthcare delivery into dynamic, collaborative, and culturally resonant systems that truly serve their communities.

Personal Autobiographical Notes

Nek Kapat

Figure 35 Nek Kapat walking across her paddy field
The photo was taken in March 2023

I was told that Nek Kapat, one of the Dayak elders, has many stories that transcend what can be conveyed in words. During my first visit, I was invited to sit on the porch while Nek Kapat cradled her granddaughter. When I expressed my desire to stay in her temporarily vacant house (Nek Kapat was living with her daughter who had just given birth), she had no objections to me occupying it during my stay in Long Lanuk village. She merely reminded me that I would need to purchase some basic necessities such as a bed, cooking equipment if I intended to cook, and water. To ensure a supply of clean water for daily use, Nek Kapat advised me to request water from a neighbour. She mentioned that the neighbour next to the house I would be occupying has a borehole with clear and clean water. "So, ask him for water," she said. I was advised not to take water from the river that flows through the village, as it was neither clean nor clear.

I regularly visited Nek Kapat's house to listen to her stories. From these visits, I became somewhat familiar with her routines and schedule—the days she was at home and the days she went to her garden across the river. When Nek Kapat was at home, she usually swung and soothed her granddaughter in the swing. When electricity and the local TV connection were available (which was rare due to frequent power outages), she enjoyed watching her favourite soap operas.

Despite her advanced age and having many grandchildren, Nek Kapat's stamina remains remarkable. She is still capable of caring for, mowing, and spraying the grass in her garden. Nek Kapat can also stand for hours in the harsh sun, wearing only a *tanggui* (a

local style hat) to harvest rice. I have also seen her lower a motor into her boat. She usually pilots the motorboat across the river when her eldest grandchild is not available to take her to the garden.

According to Nek Kapat, she is the first generation to descend from the large house in the Dayak Gaai tribe. In the traditional life of the Dayak community, the extended Dayak Gaai family lived together in one large house, inhabited by several heads of families. In her teens, Nek Kapat moved out of the large house to live with a distant family in a non-Dayak village in Berau. The elderly head of Long Lanuk village, Nek Kapat's cousin, also left the large house after she did. Nowadays, the tradition of living together in one house no longer exists in the Dayak villages of this region, although it might still persist in other Dayak communities, she says. I never asked why Nek Kapat left the large house at that time. However, she has repeatedly mentioned that her father died young, which she believes was due to sorcery.

Nek Kapat's husband had passed away when he was in his fifties. Since then, Nek Kapat has been working alone in her paddy field. With her son-in-law employed in the city, neither her children nor her grandchildren have shown any interest in farming. I accompanied Nek Kapat to her paddy field during the rice harvesting season. We travelled by land for about 20 minutes from Kampung Long Lanuk. Her farmland is located on the edge of the forest, alongside the gardens of other villagers from Long Lanuk. The path to the garden was thrilling, involving steep and rocky mountain ascents and descents. I would have preferred travelling by boat and then walking, rather than navigating the rough terrain using the mining transport routes and difficult mountain roads.

In Nek Kapat's paddy field, I carried a 5-litre water container, which Nek Kapat usually brings. Observing the height of the rice, I guessed that the harvesting technique involved using a *katam* or *anai-anai*. Seeing me dressed in a T-shirt and shorts, Nek Kapat asked why I wasn't wearing long-sleeved clothing and trousers. I shook my head and prepared myself for the itchy consequences from the rice leaves. Nek Kapat lent me an anai-anai. I noted that the design of the anai-anai seemed more modern. This anai-anai was made entirely of plastic, with a razor as the cutting tool, unlike the traditional anai-anais I used in my childhood, which were handmade from wooden boards with bamboo handles.

As she skilfully used the anai-anai, Nek Kapat's speed in cutting rice was difficult for me to match. My hands were no longer as nimble as they had been in my childhood. While harvesting rice, I talked with Nek Kapat, asking her many questions about water-related stories within the Long Lanuk village community. She spoke of the river's role, which was crucial in the past, as villagers relied heavily on it for daily water needs and drinking, as well as a fundamental source for catching fish to meet their basic consumption needs. Initially, whenever Nek Kapat discussed spiritual and mystical topics, she would pause and observe me, waiting for my reaction. It seemed she was concerned that I might not understand or believe what I was hearing. After many meetings and sharing stories over the months I spent in Long Lanuk, Nek Kapat became more relaxed in sharing tales with me, which I would often respond to by recounting similar beliefs held by the elders in my hometown, reflecting a broad similarity in belief systems.

Puyuuk

Puyuuk is regarded by local residents as a successful member of the Dayak Gaai community. He is the eldest son of one of the tribal elders, Pejangaaq. Puyuuk is married

to a Dayak Kenyah woman and has three children. He was born and attended primary school in Long Lanuk. After completing primary education, due to the absence of a local secondary school, Puyuuk continued his education at middle and high schools in the district city of Tanjung Redeb. He later completed a degree in social sciences at a state university in Samarinda, located in the province of East Kalimantan. Puyuuk is one of the few individuals born in Long Lanuk to have achieved a university degree.

After earning his degree, Puyuuk returned to Berau. By then, Long Lanuk had become one of the 36 villages within the Berau coal mining concession area. Due to his potential and connections with the Dayak community and local Dayak elders, Puyuuk secured a job in the mining company. He was assigned to the community development department, where his responsibilities included monitoring and implementing development programs in Long Lanuk. Puyuuk's primary role was to bridge the interests of the Long Lanuk village community and the mining company.

I have known Punyuuk since 2011. Our backgrounds are similar, the only difference being our ethnic origins. We both come from villages included in the coal mining concession where we worked. The distinction lies in that my close family moved from Kampung Sukan to Desa Limunjan in Sambaliung, while Punyuuk's immediate family still resides in Long Lanuk. Besides acting as an agent for the company, Punyuuk also serves as a representative of the Dayak tribe from Long Lanuk village. Conversely, at that time, I chose to avoid assignments that directly involved my village.

My interactions with Punyuuk always sparked my curiosity, as I tried to gather information and observe how he managed to align the duties and interests of the village residents with those of the mining company where he worked. Over the last 15 years, I have noticed a few changes in him compared to our conversations a decade ago, when he expressed pride in his village and the company he worked for. On the other hand, I usually felt proud of my own workplace, but gradually I reduced discussions about my hometown. Ultimately, I decided that continuing to work at the mining company was not in line with my aspirations, so I resigned.

In my view, Punyuuk seems increasingly weary of bearing the responsibility of bridging interests between the local residents and the company, a role he has held for over 15 years. Perhaps he is also tired from continually mediating conflicts. He has expressed a desire to leave the company and focus more on farming, often referencing successful farmers he has seen on social media. However, his intention to resign is held back by his family, who persuade him to stay in his current position.

Punyuuk's family holds a prominent status in Long Lanuk, thanks to his lineage as the son of a tribal elder. His reputation resonates throughout the village. To simplify matters when villagers ask about me, I often quickly respond, "I am a friend of Punyuuk." Occasionally, I visit Punyuuk's parents' home and chat with Pejangaaq. These discussions consistently offer me glimpses into my own identity. Alongside Punyuuk, I always anticipate and encourage him to speak as a Dayak prince, a son of a Dayak, and to envisage the future of the Dayak community. However, from my perspective, Punyuuk's views seem intertwined. His local resonance merges with his identity as a mining employee. As someone involved in this field, I sometimes find myself struggling with complex issues, especially when faced with questions about the relationship between identity and responsibility. Simple questions like, "If you are from this village, what actions would you take?" or "Have you contributed to your community?" become challenging to answer.

Kakuring

Kakuring, a 32-year-old Registered Nurse (RN), works as a local healthcare provider serving the community of Kampung Long Lanuk and other Dayak villages. His daily routine is largely spent at Pustu, a local clinic in the village. The clinic itself is a small building with walls adorned with various health advice and guidelines.

In 2020, the outbreak of the COVID-19 pandemic brought the world to its knees, and the area where Kakuring provides healthcare services was also impacted. Despite the increased health risks and demands, Kakuring faced a stark reality: he was not receiving any salary. The agreement he had with the healthcare centre—made out of an urgent need to deliver services—did not provide him with any financial compensation. This period deeply tested his resolve, highlighting the glaring injustices in access to healthcare and worker support.

To manage his finances, Kakuring took a side job as a driver of a local minibus. This role not only provided the necessary income for his family but also revealed the depth of his dedication. His dual responsibilities demonstrate his resilience and steadfast commitment to the welfare of his community.

Life in Kampung Long Lanuk is marked by challenges that extend beyond healthcare services. The village's isolation complicates access to essential services, including education and transportation. Kakuring often transports villagers to the nearest hospital or assists them in managing health emergencies at home. His medical expertise is perfectly complemented by logistical support, whether driving the school minibus or ensuring that the elderly receive timely medical treatment.

Kakuring's interaction with the community extends into the digital realm. He manages a WhatsApp group for the village, where he disseminates health-related information, from disease prevention to emergency updates. This initiative is part of his broader strategy to enhance health education in an area where traditional beliefs about medicine still prevail.

Figure 36 Kakuring giving a health consultation to his local patient.
The photo was taken in April 2023

Despite advances in technology and communication, the village faces significant infrastructure shortages. Problems such as unreliable internet access and inadequate water supply systems highlight the urgent need for sustainable development solutions that take into account the unique geographical and cultural context of remote communities like Kampung Long Lanuk.

I routinely shadow Kakuring on his visits to the homes of unwell villagers. One evening, we visited a villager's home; we call him Pakerte and listened to his health-related concerns. In the midst of our conversation, Pakerte handed his mobile phone to me, asking, “How do you access the scan-able vaccine app?” I was a bit perplexed and replied, “What do you mean by 'scan-able', Pakerte?” As Kakuring checked Pakerte's blood pressure, he interjected, “Barcode.”

I examined Pakerte's mobile phone and located the app in question, then handed it back to him for login access. Pakerte tried several times to log in but failed. “There’s no signal to connect to the internet, let me move to the corner of the room; I usually get a signal there.” He then shifted to the suggested corner, standing and holding his mobile phone high, finally managing to log in. “Oh dear, there are so many buttons and menu options, it's confusing,” he complained again, worried about his upcoming trip to the city and the problems he might face if he couldn't display his vaccine status barcode at the checkpoint inspection. Kakuring then offered to print the vaccine status from the app using the village head's office printer. “I'll bring it to Pakerte tomorrow morning,” I promised.

Kakuring frequently laments the state of healthcare infrastructure in remote areas. Once, while we were waiting for a vendor selling traditional food who usually circulates around the village in front of the Pustu terrace, a villager approached us to urgently request a referral letter to receive treatment at a city hospital. Such a referral from village healthcare workers is required for villagers who wish to be treated in urban hospitals. However, at

that time, Kakuring was unable to enter data into the system online to generate the referral letter, as the system must be accessed online. Meanwhile, the village was experiencing a blackout, with no electricity for more than six hours—a common occurrence where power cuts last 2, 3, 6, or even up to 12 hours.

In a panic, the villager was relieved when Kakuring provided a manual referral letter from the printed forms he had. As the villager left, Kakuring turned to me and expressed hope that the city hospital would accept this manual referral, given that they usually insist on data being inputted online.

CHAPTER 4 LISTENING AND AMPLIFYING LOCAL VOICES IN LOCAL HEALTH

Local voices play a critical role in designing health systems, as they are both part of and targeted by these systems. This chapter details the perspectives and insights of local individuals on health systems, showcasing in-depth stories and quotes from local individuals that offer a glimpse into their experiences. The findings presented in this chapter are derived from the collection, interpretation, and analysis of semi-structured interviews conducted with 15 local participants, including nine Dayak individuals and six local health workers. The interviews were conducted with the aim of engaging local knowledge, opinions, and intentions, utilising a local term known as pe' siu to facilitate dialogue with community members in the form of interviews. The primary objective of this chapter is to explore the local health experiences by situating their voices within Indigenous perspectives and human-centred design principles. It narrates the experiences and knowledge of the local Dayak people, documenting their health practices, access to healthcare, and visions for the future. Additionally, this chapter elaborates on the perspectives and experiences of local health workers who serve people in remote areas. It also discusses the interpretation of these voices, connecting them to a broader perspective within the research framework. The chapter concludes by emphasising its contribution to the knowledge of design and practices, arguing for the value of local standpoints as a means to listen and learn from local communities to enhance the design of health systems, particularly in this context.

4.1 Introduction

Nek Kapat remains uncertain about the exact date, month, and year of her birth, but she believes she is nearly 80 years old, aligning with Indonesia's independence. Many elderly individuals, born before Indonesia gained independence in 1945, lack precise information about their births due to inadequate recording and documentation during that

era.[4] Indonesia adhered to a civil registration system dating back to the colonial era until 2001 when population administration services were established, including the comprehensive recording of birth details (DUKCAPIL, 2018; Simatupang, 2020). During my fieldwork, Nek Kapat was one of the first Dayak Elders I encountered who openly shared her stories. Her voice, much like her birth certificate, had often gone unrecorded.

Voices are at the core of the Indigenous research agenda, just as they should be in human-centred design research. The voices expressed by participants in this design research are the key factor in imparting valuable insights. There exist various ways of knowing, being, and doing. In recent decades, many design scholars have vehemently criticised dominant modes of understanding that have stifled the voices of marginalised communities and their self-knowledge. For instance, the prevalence of Western worldviews, encompassing their epistemology and ontology, has primarily focused on the task of identifying and categorising the unique aspects of Indigenous Australians through research and interpretation, as noted by Said (Said, 2019; Singh, 1995). This dominant Western worldview has often resulted in the marginalisation, cultural erasure, and systemic oppression of Indigenous people, contributing to the loss of their lands, identities, and traditional ways of life (Kirmayer et al., 2012; Simpson, 2021).

In the current discourse surrounding health and design research, there is a prevalent focus on quantitative data and broad-scale trends. However, this emphasis significantly undermines the rich tapestry of individual and community narratives, which are crucial for a holistic understanding of these fields. Scholars have highlighted the persistent oversight in integrating local stories into the academic and practical frameworks that shape health and design policies (Barcham, 2022; Jennings et al., 2018; Vukic et al.,

[4]In many remote villages, the accurate recording of birth records has historically been inadequate; in my own experience, born in the 80s, my birth date was initially documented in my father's personal written records at home. It wasn’t until I turned 25 years old that I finally received my official birth certificate.

2012). These local stories are not just minor footnotes; they embody the lived experiences and cultural complexities of the communities they represent. They offer unique perspectives and profound insights that can challenge and enrich conventional research paradigms. By consistently sidelining these narratives, research fails to capture the full spectrum of human experience, potentially leading to solutions that are uninformed and less effective in addressing specific community needs.

Furthermore, these local narratives provide a critical reflection of the cultural dynamics within a community, serving as a vital tool for inclusive and empathetic research methodologies. The acknowledgment and integration of stories from diverse community backgrounds into studies illuminate the multifaceted nature of health and design challenges that standardised data sets may overlook (Jennings et al., 2018). These insights are invaluable in tailoring interventions that are culturally sensitive and more likely to be embraced by the community (Vukic et al., 2012; Wilson et al., 2015). As these personal and community stories are woven into the everyday fabric of people's lives, they embody a powerful means of understanding and implementing change that resonates on a personal level (Miller, 2019; Nguyen et al., 2017). Therefore, fostering a research ethos that values and systematically incorporates these local insights could significantly transform the landscape of health and design research, ultimately leading to scientifically robust, culturally congruent, and impactful outcomes (Smith, 2020; Davis & Markel, 2021). This suggests a move towards a more local-centred approach in research methodologies, advocating for rigorous qualitative depth (Henderson et al., 2018).

In this research, I have listened to the voice of the Dayak people, recognising that active listening in this context is a crucial reflexive practice that fosters cultural humility, prompts critical self-reflection, and encourages openness. Therefore, I have placed local voices at the forefront of this chapter, having had the privilege of engaging with and listening to them. This chapter directly addresses research question 2—Using the

Indigenous standpoint, how do Dayak communities engage in health practices in their daily lives?—and a set of associated questions:

- Where do they seek health information when exploring health alternatives beyond their communities?
- How do they perceive health promotion materials when receiving health information from healthcare workers outside their communities, and what factors should be considered when offering such support?
- How do they envision their future health and well-being?

The objective of this chapter is to explore local experiences in health by situating their voices within Indigenous standpoints and human-centred design perspectives to better understand their local health experiences.

In this chapter, I frame interviews as a platform for sharing perspectives and stories. To reflect this concept, I have integrated local terminology with the term *pe' siu* interview. Pe' siu, a term of the Dayak language, signifies the act of telling or sharing stories. It can be understood as stories shared through the medium of interviews. From an Indigenous viewpoint, stories play a crucial role in preserving local values, knowledge, and perspectives. The stories documented during interviews, along with the act of listening to them, offer valuable insights and cultivate empathy when delving into the human experience and the concept of a human-centred perspective.

The chapter is structured with a brief introduction that outlines the role of local health within the broader context of health. Following the articulation of this perspective, I delve into the local term pe' siu to contextualise my interviews with local individuals. Subsequently, I narrate the experiences and knowledge of local Dayak people, documenting their health practices, access to healthcare, and visions for the future. I then elaborate on the perspectives and experiences of local health workers who serve people

in remote areas. Finally, in the discussion section, I offer my interpretation, connecting it to a broader perspective within this inquiry and my research approaches.

4.2 Local Voices in Health

In numerous Indigenous cultures, the conception of health transcends the narrow confines of physical wellness to include expansive dimensions of mental and social well-being. This view is consistent with the holistic definition of health provided by the World Health Organization (WHO), which describes health as a state of complete physical, mental, and social well-being, rather than merely the absence of disease or infirmity (Sartorius, 2006; WHO, 2018). This holistic approach is not merely a theoretical framework but is deeply ingrained in the everyday practices and spiritual beliefs of these communities (Sartorius, 2006). Traditional healthcare systems within these cultures typically emphasise the interconnectedness of the mind, body, and spirit, proposing that health is a dynamic balance that must be nurtured through integrated care practices (Wilson & Rosenberg, 2016). The focus here is on preventive measures and the utilisation of natural, locally available medicinal resources, often accompanied by rituals and ceremonies that address the spiritual dimensions of healing. This integration of spiritual and physical care not only caters to immediate health needs but also plays a significant role in community bonding and cultural preservation (Kirmayer et al., 2012).

Moreover, these traditional health practices offer valuable insights into the efficacy of holistic health interventions, which can be particularly instrumental in addressing complex health issues that modern medicine often struggles with, such as mental health disorders and chronic diseases (Nguyen et al., 2017). For instance, the use of medicinal plants coupled with spiritual healing practices among Native American tribes has been proven to significantly alleviate symptoms of depression and anxiety, highlighting the profound impact of treating the individual as a whole rather than focusing on isolated symptoms (Miller, 2019). Recognising the potential of these traditional practices, the WHO advocates for their integration into contemporary healthcare systems to enhance the

inclusivity and effectiveness of health interventions (WHO, 2018). By embracing these age-old wisdoms, we pave the way towards a more comprehensive and empathetic healthcare system that aligns more closely with the multifaceted nature of human health, thereby fostering a better quality of life for all. Such integrative approaches not only challenge the prevailing biomedical paradigms but also enrich them, offering a more nuanced understanding of health that is both culturally sensitive and scientifically robust (Henderson et al., 2021).

In addition to Indigenous traditional healthcare practices, there exists a contemporary infrastructure dedicated to providing healthcare services to Indigenous communities. It is imperative to comprehend the importance of accessibility of healthcare for local people to gain a holistic understanding of the obstacles faced by Indigenous individuals living in rural communities when seeking medical assistance. These barriers include the absence of healthcare facilities in their region, particularly in remote areas, services being located far away without convenient transportation options, financial constraints, lengthy waiting times, and the need for culturally sensitive and responsive healthcare services. The barriers to healthcare access are not unique to local people in Indonesia. For example, Indigenous communities in remote areas of Australia are still grappling with the same issues (Bourke et al., 2021; Nolan-Isles et al., 2021; Warwick et al., 2019), as are the local populations in Coari and Tefé in the State of Amazonas, Brazil (Santos et al., 2016; Sousa et al., 2022).

Envisioning the future of health for local communities reflects both hope and concern for their well-being and the sustainability of their homes. Health practices, knowledge, access to healthcare, and future perspectives are conveyed through this narration that features the voices of the local community. These individuals possess an intimate understanding of their own concerns, having resided in the region for generations. As this is their homeland and cultural heritage, it is crucial to seek their

authentic input and listen attentively to their valuable insights and perspectives from an Indigenous standpoint, as they are experts in their own reality.

In this chapter, local voices with similar cultural backgrounds and life experiences as Indigenous individuals born, residing, and existing in the region share their stories. These local voices serve as representations that articulate the experiences and realities of local community life pertaining to health, which are inseparable from elements of the local culture and beliefs.

4.3 Pe' siu

In section 2.4.2 (Chapter 2), the concept of pe' siu and its significance among local individuals is discussed. Pe' siu, which translates to *bercerita* in Indonesian or "sharing stories" in English, is a form of communication that aligns with the local culture by conveying a sense of informality and familiarity. Unlike the term for an interview, *wawancara*, which is often perceived as a formal way to pose questions and may not resonate well with local people in this context, pe' siu reflects social relations within the community. In the context of sharing stories, there is no clear right or wrong, and there is a sense of equality, whereas, in an interview, formality may imply a hierarchy where one person is considered superior to others.

In this chapter, I interpret pe' siu based on my understanding of the significance of storytelling in the Indigenous research agenda. Barcham (2021), for instance, explores the use of stories as a collaborative method with Indigenous communities. Through storytelling, local people can articulate their worldviews, beliefs, and experiences without the concern of being judged for providing incorrect answers to interviewer questions. Framing my interactions with local individuals as pe' siu rather than traditional interviews presents a means for me to listen to and document stories from local individuals. This approach allows for a more dialogical connection between my interview questions and the concept of pe' siu.

By employing pe' siu, I proceed to recount local voices, narrating stories to acquire insights into the experiences of local individuals with respect to health within this context. I initiate this process by presenting Nek Kapat as a starting point to gain a glimpse into the daily life of the Dayak people and its connection to their health. These local perspectives are essential for fostering a critical understanding of the community's design and health dynamics.

4.4 Dayak Voices

Nek Kapat resides with her daughter, who has three children. Her son-in-law works outside the village and only returns home occasionally during his leave or holidays. Nek Kapat assists her daughter in taking care of household work, including caring for the youngest child. Apart from household duties, Nek Kapat has a routine job, farming across the village river. She owns extensive agricultural land that has been passed down through generations as a hereditary inheritance.

Nek Kapat recalls being the first generation to leave the large house of the Dayak Gaai tribe. In traditional Dayak community life, the entire extended family of the Dayak Gaai tribe resides together in a substantial house, which is occupied by several family heads (Sellato, 2002; Wardani et al., 2018; Zain et al., 2021). As a teenager, Nek Kapat left the large house and lived with her family in a non-Dayak village in Berau before eventually returning to reside in a Dayak village. The parents of the Long Lanuk village head, who was Nek Kapat's cousin, also left the large house after her departure.

Nek Kapat is acquainted with all the Dayak people in her village, and the Dayak community living there maintains close family ties with her. Like in most Dayak communities, the tradition of cohabiting in a large house no longer prevails in Dayak villages in this area. Nek Kapat mentioned that this tradition might still endure in other Dayak communities. Although she was not specifically questioned about the reasons for leaving the large house, she mentioned several times that her father's early death was attributed to witchcraft.

Working in the Nek Kapat paddy field demands strong physical stamina. Even at her current age, Nek Kapat still possesses good stamina. Annually, she consistently engages in rice planting, as planting paddy is part of community life. In her paddy field, the entire planting process is carried out by Nek Kapat alone, starting from preparing the land and tending to the plants to harvesting the rice. She can endure the hot sun for hours simply by wearing a tanggui (cap/hat) during rice harvesting. The traditional rice planting technique she uses relies on manual equipment, as her rice harvesting equipment is a simply designed rice-cutting tool.

Certainly, the Indigenous Dayak people have a deep connection to farming and agriculture (Adi, 2010; Mulyoutami et al., 2009). Other Dayaks, such as Pak Pejangaag, a Dayak elder in the village, states, "*I have been a paddy farmer all my life*," and Kek Hapit, who recalls, *"Even though I often move between rice fields, I always plant rice every year to meet my family daily needs and we consume it throughout the year*." Traditionally, the Dayak community has been engaged in subsistence farming, cultivating crops for their own sustenance and the well-being of their communities. One of their common agricultural practices is shifting cultivation, also known as *swidden* or slash-and-burn farming, where they clear a portion of land, cultivate it for a few years, and then move to another area while allowing the previous plot to regenerate.

Similar to Nek Kapat's paddy field, rice is a staple crop for the Dayak people. They have developed various agricultural practices adapted to the diverse ecosystems of Borneo. In addition to rice, they cultivate other crops such as vegetables, fruits, and spices. Agriculture is not only an economic activity but also holds great cultural significance for the Dayak, as it is intertwined with their traditions, rituals, and overall way of life (Hastuti et al., 2021).

Nek Kapat, a prominent figure in her community, is not the only farmer in her large family. Her younger sister, familiarly known as Ketigaaq, is also an active farmer who cultivates land across the river. I was able to witness firsthand Ketigaaq expertly

navigating a ketinting (small boat) across the river to reach her garden. She says, "*It is easier to go to our field using a ketinting, as it has become part of our daily routine*." Almost all Dayak residents in Long Lanuk village actively participate in farming, as agricultural activities constitute an integral aspect of Dayak community culture. Their local calendar records events such as traditional ceremonies during the harvest season and collaborative efforts in harvesting together. Pak Pejangaaq, another member of the community, views farming as a form of health practice or sports activity integrated into their daily lives.

Through several meetings and engagements with Nek Kapat's daily activities, I had the opportunity to listen to her stories. While *mengayun*[5] to put her grandson to sleep on the swing, Nek Kapat often shares stories about food. She prefers river fish to meat or chicken. Nek Kapat enjoys cassava leaf vegetables, prepares her own chilli sauce, and drinks water. Despite being ill for two years, she takes pride in her health. Nek Kapat disclosed that she had sought medical help in the district city during that time but did not find relief until she received advice from local relatives regarding the use of local herbal medicine containing turmeric and lime. She says, "*I was ill for two years, and despite treatment at a clinic in Tanjung, I did not recover. I then refocused on herbal medicines from plants*." Since that experience, consuming a concoction of turmeric and lime has become a part of Nek Kapat's daily lifestyle.

4.4.1 Local health practices

The WHO views health and well-being as a comprehensive state of physical, mental, and social well-being for individuals and communities (WHO, 1948; Schramme, 2023). This perspective also reflects traditional knowledge among the Dayak people, where their understanding of health encompasses various dimensions, from the spiritual to the

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[5] Swinging

communal (Az-Zahra et al., 2021; Jay, 1989; Luardini, 2016). This health perspective is often overlooked in health practices, which are still dominated by the view that health issues are solely related to physical health. However, in the local health practices of the Dayak community, there exists a view that positions collective health within the community, the use of traditional healing that is spiritual in nature, and which is deeply rooted in the idea of togetherness within the community. The Dayak community's health perspective is elaborated in this section on local health practices through the voices of local people such as Nek Kapat and others.

Nek Kapat was raised in a family and community deeply rooted in traditional health knowledge. The Dayak people have a rich culture of incorporating traditional medicine in diverse ways, drawing upon their extensive understanding of local plants and traditional healing practices (Az-Zahra et al., 2021). They possess comprehensive knowledge of the medicinal properties of local plants and herbs, utilising various plant parts such as leaves, roots, and bark to create herbal remedies. These remedies are often prepared through specific methods like boiling, infusion, or decoction and are employed to address a broad spectrum of health issues.

During her upbringing, Nek Kapat's access to modern medicine in Dayak villages was markedly scarce. The dissemination of modern medical practices and introduction of new generic medicines across Indonesia's rural locales have been sporadically uneven since the establishment of the Community Health Centre (Pustu) in 1986 (Lubis, 2006). Kasaq, a mother of two, says, "*We live in a remote village; Pustu has only just been established, so previously, we relied more on traditional medicine*." Kanam, the head of the Dayak village, states, "*I repeatedly requested the local government to build Pustu, and they approved it four years ago."* This inconsistency significantly shaped Nek Kapat's reliance on Indigenous health practices well into her adolescence. She reminisces about a time when the Dayak community primarily turned to plant-based remedies to treat common ailments, such as diarrhoea and colds, which were the time's prevalent health

issues. Contrasting with the past, she observes a diversification in health complications among today's village populace, including stress, high blood pressure, strokes, and cholesterol issues—conditions that were virtually unheard of in her youth. This shift not only highlights the changes in disease patterns but also underscores a growing need for integrating traditional healing practices with systematic modern medical interventions to address the increasingly complex health landscape in Dayak villages. The evolution of these health issues reflects broader epidemiological transitions influenced by lifestyle, environmental changes, and possibly increased awareness and diagnostic capabilities within the community. Nek Kapat recalls:

> *In the past, we Dayak people relied on plants for treatment. However, during that time, people in this village generally only experienced illnesses such as diarrhoea and colds. Nowadays, various illnesses affect the village community, such as stress, high blood pressure, stroke, and cholesterol. Previously, there were no diseases like that in the village.*

In May 2017, a team of health researchers from the University of Indonesia conducted research on the practice of using traditional medicine for treating sick children within the Dayak community in the Sintang area of Kalimantan (Anggerainy et al., 2017). The use of herbal plants for traditional medicine is a common practice among the Dayak people, with individuals like Pak Pejangaaq often relying on remedies such as 'root boiled' water (*pasak bumi*) and boiled ginger to maintain his body's health. Pak Pejangaaq says: "We Dayak people have many traditional medicines that we use, such as ginger decoction, which can increase stamina. Even though modern medicine is available in hospitals, we still need and use traditional medicine."

The traditional healing practices of the Dayak people, as observed in individuals like Nek Kapat, Kasaq, and Pak Pejangaaq, are also known to the general public. In 2019, the media in Indonesia was abuzz with reports on research findings by high school children in Palang Karaya, Central Kalimantan. Yazid Rafi Akbar, Anggina Rafitri, and

Aysa Aurealya Maharani clinched a gold medal at the World Invention Creativity Olympics in Seoul, South Korea, in 2019, with their research believed to have discovered the healing properties of *bajakah*, a typical Dayak plant that can be used to treat cancer (Fatizah, 2021; Liputan6.com, 2019; Nastiti & Nugraha, 2022). This achievement concerning the discovery of the properties of the bajakah plant even received additional awards from the Ministry of Education, Culture, Research, and Technology (KEMENDIKBUD) during the Indonesian independence ceremony at the Presidential Palace of the Republic of Indonesia. News about the benefits of bajakah also reached the Benabaru Dayak elder, Pak Karooq. Pak Karooq, a middle school teacher who dedicated himself to the Dayak village, was diagnosed with cancer. Bemanuk, his eldest daughter, states:

> *When my father was diagnosed with cancer, the family provided him with bajakah wood. This wood was boiled and consumed three times a week. At that time, my father's cancer had reached the final stage, so he only had time to drink water from boiled Bajakah wood a few times. Then, my father passed away.*

Moreover, traditional medicine among the Dayak often encompasses a spiritual dimension. Traditional healers, known in Indonesian as *dukun*, may conduct rituals that include chants, prayers, and the use of symbolic objects to connect with spiritual forces (Olendo et al., 2022). This spiritual aspect is believed to further contribute to overall healing and well-being. Additionally, healing ceremonies and rituals are observed within the Dayak community, as these are integral to traditional medicine practices. Puyuuk states, "*Every year, we still perform spiritual rituals in accordance with the teachings of the Dayak elders. For example, at the beginning of the year, we typically carry out a ritual to ward off misfortune in the village*." These may involve the participation of the entire community, emphasising collective well-being. Ceremonies can be specific to certain

ailments, life events, or seasons, incorporating elements of dance, music, and offerings (Jay, 1989; Luardini, 2016).

Nek Kapat carries a vivid emblem of her heritage through tattoos inked on both wrists, etched into her skin by Dayak elders during her teenage years. These tattoos are more than mere body art; they are imbued with cultural significance, believed to offer protection against illnesses. She describes the intricate rituals of her youth, where the whole village would unite in the face of sickness. The communal practices involved gathering to pray, crafting amulets from forest materials, and making offerings in the river—acts steeped in the spiritual traditions of the Dayak people. The village head, Kanam, says, "*Our village is usually closed to outsiders during certain ritual processes, especially the misfortune-averting ritual*." Kek Hapit, who often participates in these rituals, notes, "*The preparation process is typically lengthy and involves several specific requirements that must be met*." During such times, the village would suspend all regular activities, such as farming, to focus entirely on the ritual. It is important to note that these sacred ceremonies were exclusive to the community; entry of foreigners (non-residents) into the village was strictly forbidden until the traditional elders proclaimed the rituals complete. This deep-rooted cultural practice reflects the holistic approach of the Dayak people, where health and well-being are intricately linked to spiritual and communal harmony. The tattoos on Nek Kapat's wrists symbolise this profound connection, serving as a protective and enduring link to her cultural past and a testament to the community's age-old traditions and beliefs in safeguarding their own. She states:

> *This tattoo [showing the tattoos on both wrists] was made by traditional elders when I was young. In ancient times, when someone was sick, usually the village community gathered to pray together, make an antidote [amulet] from the traditional forest, and then "gave offerings in the river." In this ritual procession, all residents are expected to gather together and are not permitted to carry out activities such as going to the garden. Foreigners (non-village residents) are prohibited from entering the village area until the traditional elders declare that the ritual procession is complete.*

If the older generation continues to uphold the cultural practices embedded in their bodies, such as the tattoo worn by Nek Kapat, this belief will likely persist in the younger generation, even if only in the form of stories. For instance, Puyuuk, a Dayak man approaching 40 years, currently does not bear any tattoos, either as a symbol of Dayak tribal identity or the typical Dayak tattoos generally believed to provide protection against disease, like those of Nek Kapat. In his testimony, Puyuuk points out that these rituals are still observed in the Dayak community.

> *In the past, several years ago, traditional health practices were still very robust in our village. For instance, there were rituals for healing that were supernatural or mystical, such as placing sick people in the middle and the traditional head calling on spirits to aid in healing. Besides, there are regular annual rituals, such as the Ritual of Rejecting Bala, which aims to maintain the village and its residents' health, protecting them from disease or epidemics. This ritual is typically conducted at the beginning of the year. These are just a few instances of the numerous rituals related to health within our culture. In the past, there were also dukun kampung (village midwives) with special knowledge. Even without formal education, they were adept at facilitating smooth childbirth processes. I was also born at home with the assistance of a village dukun, not in a hospital clinic.*

In the past, in most of Kalimantan, the birth of a baby took place entirely at home and was managed by a midwife. Similar to Nek Kapat, Puyuuk, myself, and others in the interior who were born up until the 1980s were primarily cared for by bidan kampung (neighbourhood midwife). Puyuuk says, "*My four siblings and I were delivered by a bidan kampung.*" This birthing process is inseparable from traditional medicine involving plants and spiritual elements. Before the official midwife from the Pustu arrived in Long Lanuk, Kasaq, her mother-in-law—who has three children and used to be a bidan kampung — assisted with the birthing process for the mothers by applying traditional knowledge and preparing mixtures containing ingredients like lemongrass, turmeric, ginger, and galangal. Kasaaq claims, "*I too was born with the help of a bidan kampung. My first child was also*

delivered by a bidan kampung. My second and third children were born with the assistance of a official midwife."

5.4.2 Access to health systems

In numerous Dayak communities, the lack of access to healthcare remains a substantial challenge, especially in remote and rural areas. Factors such as geographical isolation, inadequate infrastructure, and a historical disparity in healthcare resource distribution have exacerbated this issue. The absence of well-equipped healthcare facilities and a shortage of trained medical professionals in these regions result in restricted healthcare services. A prime example can be seen in the Berau Regency, where the population numbers around 250,000 people (BPS, 2020), yet there is only one hospital located in Tanjung Redeb, the capital of the Berau district. This hospital poses a challenge for Dayak people residing in rural areas who struggle to access it.

For Dayak people residing in areas with limited access to health information and education, a significant gap exists in their awareness and understanding of essential healthcare practices. The remote nature of these locations and lack of infrastructure contribute to the challenge, preventing the dissemination of crucial health information. Kanam and Puyuuk jokingly comment on the internet infrastructure, saying, "*The internet connection comes and goes, carried away by the winds of Nyapa*." Without formal health education programs, the Dayak community may rely heavily on traditional knowledge passed down through generations, potentially limiting exposure to modern preventive measures and healthcare advancements. When asked about the availability of health information, Puyuuk responded, "*I haven't seen any health information. Have you come across any in this village area*?" The lack of access to up-to-date health information further perpetuates health disparities, hindering the community's ability to make informed decisions about their well-being and leaving them susceptible to preventable health issues. Bridging this gap necessitates tailored health education initiatives that consider

cultural nuances and employ strategies that resonate with the Dayak community's unique context and beliefs.

Nek Kapat relies primarily on information from neighbours and occasional traders who visit from the district city about health and disease. Additionally, she often engages in discussions with fellow Dayak people to exchange information about certain diseases and their treatments. Despite her active participation in these conversations, Nek Kapat stated that she has never received informational materials such as posters or brochures. According to her, local people prefer direct communication and face-to-face interactions when conveying information, education, or health-related issues. Kanam explained, "*Health information is usually conveyed face-to-face during village meetings because, you know, the older generations have limited baca tulis [literacy skills].*"

Preventive health promotion and education services are indispensable components of community health infrastructure, particularly in local settings where such provisions can dramatically alter health outcomes. The stark absence of these services represents a critical gap, deeply felt across local communities. Puyuuk stated, *"In my opinion, health literacy in this village is still lacking, especially now with more complex modern diseases.*" He emphasised the pressing need for comprehensive educational programmes, specifically around issues such as hepatitis, which remains a covert yet persistent threat. Puyuuk pointed out the crucial necessity for raising awareness and promoting vaccination against hepatitis B to combat the spread of the disease. His concerns are heightened by the socio-economic dynamics of the village, where many young residents are employed by nearby companies. This employment not only increases their exposure to diverse groups, potentially escalating the risk of contracting hepatitis, but also underscores the urgency for preventive measures. Puyuuk articulates a clear connection between the occupational settings of these young workers and the heightened risk of infectious diseases, advocating for targeted health education to effectively mitigate these risks. Such initiatives are vital not only for individual health but also for safeguarding

public health, particularly in communities closely linked to industrial activities. Puyuuk highlighted the need for hepatitis education, stating:

> *We need education and reminders about important issues such as the hepatitis B vaccine, a disease that is sometimes unnoticed but still exists. Why is this important now? Many young people in this village work in companies that operate around the village. Their jobs bring them into contact with other workers, so I think the potential for hepatitis is very likely.*

Pengerai, a Dayak Gaai residing in Long Lanuk, shared his experience with health workers at the sub-community health centre (Pustu). He stated, "*Pustu health workers previously did not want to stay in our village. So, the health services used to close at 12 noon on weekdays*." In Long Lanuk, health workers assigned by the local government are not local residents of the area, often residing in the city and only visiting the village occasionally. This inconsistency in health services can lead to uncertainty for the village residents. During a time when Pengerai fell ill, he faced a situation where the health worker requested additional payment for services rendered after 12 noon.

The establishment of Pustu in rural areas of Indonesia was intended to enhance healthcare accessibility, but it encounters numerous challenges. Factors such as village isolation and limited infrastructure in these rural settings often result in difficulties in establishing well-equipped Pustu facilities. Leman said,

> *The ambulance only arrived at Pustu about two years ago. Before that, if a villager fell ill and needed urgent transport to the city hospital, we would usually borrow a car from a resident. There was one villager who had a car at that time.*

He added, "*Before that, about ten years ago, we typically used a ketinting boat. The journey by ketinting to the hospital would take 4–5 hours. Just imagine that*." The shortage of trained healthcare professionals and unequal distribution of resources contributes to a lack of comprehensive healthcare services. Additionally, the limited awareness and education about the existence and functions of Pustu among the local population pose considerable

challenges. Moreover, the remoteness of some rural areas hampers regular and timely visits from medical professionals. These issues collectively impact the effectiveness of Pustu in providing essential healthcare services to rural communities, highlighting the need for targeted efforts to address these challenges and improve healthcare delivery in Indonesia's rural regions.

The predicament of unreliable healthcare services has emerged as a significant concern among the residents of Long Lanuk village, with the Pustu clinic serving as the primary source of medical provisions in the area. The inconsistency in the availability of health workers at the clinic often leaves villagers without essential medical services, a gap that becomes perilously wide for those in urgent need of care. Pengerai highlighted the critical nature of this shortfall, noting the dire consequences for residents who require immediate and specialised medical interventions, such as blood transfusions. The absence of such services, coupled with the substantial distances to urban hospitals, poses a fatal risk to those in critical conditions. He advocated for a comprehensive enhancement of healthcare infrastructure within rural communities, including the recruitment of a full team of complementary healthcare workers, the establishment of well-equipped and properly constructed facilities, and the introduction of a broader range of medical services. Pengerai also proposed that corporations, particularly those whose activities detrimentally impact the environment and, by extension, public health, should actively contribute to the development of local healthcare infrastructure. He envisioned a scenario where each village boasts a fully-equipped community health centre staffed by skilled medical personnel, capable of offering a wide variety of treatments. This, he argues, is not merely an improvement but a critical necessity to anticipate health crises that could otherwise force villagers to undertake expensive and logistically challenging trips to distant cities for treatment. The provision of comprehensive, localised healthcare services is seen not only as a matter of convenience but as a vital lifeline for the

community, underscoring the essential role of accessible medical care in ensuring the well-being of rural populations. Pengerai explained:

> *People who are sick in the village cannot be treated because there is no first aid available in the village. For example, there is no blood transfusion service, even though there are blood donors. If someone lacks blood and has to be taken to a hospital, which is not necessarily close, they may end up dying. Therefore, every village should have complete health workers, adequate facilities, and suitable buildings for proper treatment. Companies that damage the environment should contribute to this cause. Health service facilities in every village should be adequate, complete, and staffed with qualified personnel so that they can be well-managed. If not, there is no way out; this is called anticipation. Otherwise, every sick person must be sent to Samarinda, Balikpapan, or Surabaya. We need money, but if there is one complete Puskesmas in every village with good treatment and medical personnel, then this can be addressed.*

4.4.3 Future

As Nek Kapat's thoughts on public health meandered into the future, her outlook was tinged with scepticism, momentarily interrupted by the sudden cry of her granddaughter stirring in her swing. This personal moment prompted her to reminisce about the past, a time she recalled as devoid of the prevalent health issues seen today. Kek Hapit said, "*Diseases nowadays vary widely. Hopefully, the younger generation will find ways to prevent them and healthcare facilities will continue to improve in the future*." Pengerai voiced pressing concerns regarding the environmental and health challenges facing the Dayak community, particularly influenced by their proximity to industrial activities. He explained:

> *The position of our village is not far from the mine, so dust and air pollution are worsening. I can already see the future; there are many dangers lurking... the forests are disappearing, factories are expanding, and human resources in this hinterland cannot compete. Water conditions are very difficult to anticipate*

> *because all the waste goes into the river. This makes us breathe dust, drink polluted water, and results in health damage.*

He highlighted the dire consequences of environmental degradation not just on nature but also on public health. The compounding issue of rising healthcare costs exacerbates the situation, as Pengerai further lamented: "*What can we do after someone is sick, what is it called... treatment is becoming more expensive. The price, BPJS*[6] *payments are increasing, so what about those who can't afford it*?"

His rhetoric not only underscores the immediate health risks but also questions the sustainability of healthcare financing for the community's economically vulnerable segments.

Pengerai's concerns were echoed by Bemanuk, who expressed worries about various local health issues such as kidney disease, gout, respiratory problems, and environmental health factors. She stated, "*Clean water from PDAM has not yet reached the village, even though clean water is one of the determining factors for our health*." Additionally, Bemanuk's experience of losing both of her parents—her mother to diabetes and her father to cancer before the age of 60—cast a dark shadow of uncertainty on her future.

Although the current circumstances raise concerns about the future, some Dayaks, including Kasaq, see a glimmer of hope. Kasaq recalled,

> *During my time in the village, I have witnessed several improvements in healthcare facilities, such as the establishment of a health post. Previously, there was no such building. Moreover, we did not have resident healthcare workers before, but now we do have healthcare staff permanently based in the village.*

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[6] BPJS is an Indonesian social security organisation dedicated to offering universal health care to the population.

Kasaq is actively involved in a health community group in the village and invites mothers in the village to participate in discussions and health meetings. During the course of these activities, she had the opportunity to witness the evolution of the healthcare system within the Dayak village. Previously, the village lacked any health infrastructure, and formal health workers from the local government were notably absent. However, there has been a significant shift with the construction of local health facilities, albeit on a small scale.

Puyuuk recognised the need for a design system that connects the local health system with the environment, based on an adequate sanitation system, emphasising the importance of access to clean water and a comprehensive health promotion and prevention strategy. The hope for building a robust health system is, of course, closely related to the structural conditions of the village, which currently sits in close proximity to operational coal mines and palm oil plantations. The accountability of these private corporations is also a determining factor for local health, as stated by Puyuuk:

> *When discussing [health] issues, we cannot ignore the role of companies. These companies should continue to fulfil their social responsibility obligations in their operational areas to minimise negative impacts on local villages. For example, if water has been contaminated, companies should provide water treatment installation (WTP). Contaminated river water certainly cannot be consumed if it contains high levels of iron, for example.*

The proximity of Long Lanuk village to industrial zones continues to cast a shadow over its inhabitants, intertwining their daily lives with the complexities of adjacent economic development. Historically, the village was presented with propositions from coal mining companies for a mass relocation to a resettlement area designed by the corporations. Such proposals were unanimously declined by the villagers, who hold the location of Long Lanuk as a sacred legacy bequeathed by their Dayak elders. Kanam, the village head and a descendant of the Dayak people, has articulated a vision that encapsulates both the challenges and aspirations of his community. He dreams of

transforming Long Lanuk into a bastion of health and self-sufficiency, equipped with all the fundamental resources necessary for a dignified existence. However, the realisation of such a dream is marred by practical difficulties, such as the absence of a reliable government water supply, forcing the village dependent to rely on limited and imperfect local resources. Surrounded by powerful industrial entities, Long Lanuk feels overshadowed by corporate giants whose operations threaten to disrupt traditional lifestyles. Kanam's strategy does not involve a direct confrontation with these industrial behemoths but rather a synergistic coexistence with the natural environment. By aligning the village's development with the rhythms of nature, he hopes to forge a sustainable path forward, leveraging natural elements to compensate for industrial encroachments and preserve the cultural and ecological heritage of Long Lanuk. This vision of cohabitation rather than competition with the industrial landscape offers a promising outlook on managing the delicate balance between development and tradition. Kanam described his dream:

> *My dream is for this village to be a healthy village and have all the basic resources we need to support our lives here. We still don't know when government water access will be available. Until then, we can only rely on what we have now, even though it is not perfect. Our village location is surrounded by large companies that are changing our way of life. It is like a huge giant company that I didn't think I could compete with. The best way I can see right now is to live side by side, collaborating with nature and all its elements.*

4.5 Health Worker's Voices

The role of health workers in addressing these complex issues is critical, and their voices must also be taken into account. Health workers in local Indonesian communities face a myriad of challenges that impact the effectiveness and accessibility of healthcare services. Factors such as location and inadequate infrastructure in rural areas can hinder the recruitment and retention of healthcare professionals. Additionally, the limited access

to ongoing training and professional development opportunities may impede the ability of local health workers to stay abreast of evolving medical practices. Moreover, the shortage of healthcare facilities and resources can place a strain on local health workers, affecting the quality and scope of healthcare services they can provide. Cultural diversity and language barriers may also impact communication and patient care. Addressing these challenges requires comprehensive strategies, including targeted investments in healthcare infrastructure, improved access to education and training, and initiatives that prioritise the well-being and professional growth of health workers in local settings.

4.5.1 Local health practices, two worlds

In the Dayak villages, the integration of cultural elements within healthcare practices is highly valued by local health workers, who are well-versed in the traditional medicinal methods passed down through generations. Kakuring, a local health practitioner, provides insight into the customary health practices that are deeply entrenched in the community's way of life. According to him, residents commonly rely on natural remedies, including ingredients such as turmeric and cat's whiskers (known locally as *tanaman kumis kucing*)—a plant revered for its medicinal properties. Additionally, small cucumbers are frequently used by those suffering from high blood pressure. These practices are not viewed as mere alternatives but as local wisdom, with their origins tracing back to a time long before the advent of modern medicine. This enduring reliance on traditional medicine underscores a holistic approach to health that remains in harmony with the cultural and environmental paradigms of the Dayak people. Such practices highlight the rich medicinal knowledge that exists within the community and reflect a deep-rooted belief in the efficacy of nature's bounty in providing health solutions, which is both respected and preserved by local health workers. In Kakuring's words:

> *Usually, people here use traditional medicines such as turmeric, cat's whiskers*[7] *(tanaman kumis kucing), and for those who have high blood pressure, they use small cucumbers. This is local wisdom that has existed since ancient times, before modern medicine.*

Mariang, a seasoned health worker affiliated with a local NGO, has dedicated decades to promoting health within Dayak communities. His experiences echo those of Kakuring, particularly in their collaborative efforts with the Pustu health facility in Long Lanuk, underscoring a deep-rooted reverence for local medicinal knowledge that is pervasive across Dayak villages. This traditional knowledge manifests in two predominant forms. The first involves shamanic practices, which entail rituals believed to cure physical ailments and provide divination of future events and other metaphysical services provided by shamans. The second form is the utilisation of herbal medicines, derived from local flora commonly found in village environs or dense forests. These plants are meticulously processed into remedies that have been trusted by generations to treat various diseases. Despite advances in modern healthcare, these practices are ingrained deeply within the cultural fabric of the Dayak people, serving as more than mere alternative methods but as a way of life. This enduring tradition highlights a unique blend of spirituality and natural pharmacopeia, pivotal in the health maintenance and disease prevention strategies of Dayak villages. The persistence of these practices within local communities attests to their efficacy and cultural significance, maintained through centuries of empirical knowledge and transmitted across generations. Mariang explains:

> *So, local wisdom or knowledge grows and becomes part of their culture. There are two types of local knowledge generally carried out by local people. First, shamanic practices, which are often believed by local residents to cure diseases. Shamanic practices involve reading future or other practices led by*

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[7] Orthosiphon aristatus (Jave tea)

> *a shaman. Meanwhile, local knowledge or second local wisdom involves the use of herbal medicines from local plants, which are usually found in villages or forests. These local plants are often processed into herbal medicines and used to cure diseases. As previously mentioned, this habit is difficult to break and has become part of their culture, so this practice is still commonly carried out in local communities.*

Mariang and Babilem usually advise village residents to seek care at the health centre or community health centres when they are ill or wish to discuss health concerns. Babilem said, '*Well, they [Dayak] have Pustu now, so I hope they come to Pustu if they are sick*.' Mariang collaborates with local health volunteers who have nursing backgrounds to allow residents or patients to continue using shamanic practices or herbal medicines if they choose. However, these volunteer nurses still conduct disease examinations on patients and recommend appropriate medications. Mariang stated: "*In our work, we have never experienced resistance when we advocate modern medicine because we still respect local wisdom or knowledge*."

The traditional healing practices of the Dayak tribe, particularly their extensive use of local plants and herbs, have garnered the interest of the Indonesian Department of Health. Dr Bahenda, a local medical doctor (MD) employed at the sole public hospital in Berau Regency, acknowledges the profound botanical knowledge ingrained within the Dayak community. With a wealth of experience in community health across various local villages, Dr Bahenda, whose training and medical expertise are rooted in modern medicine, has some reservations regarding these traditional methods. Her concerns primarily centre around the potential side effects of these plant-based treatments, which remain largely undocumented and scientifically unverified. A health worker, Mahilak, also expressed concerns about plant-based medicine, saying, "*Sometimes we do not really know the side effects*." For instance, *Bajakah* wood has been popularised by the media for its purported anti-cancer properties, yet the scientific community lacks comprehensive research on the different types of Bajakah wood and their specific medicinal benefits. This

knowledge gap underscores the need for more rigorous scientific evaluation to fully understand and potentially integrate Dayak herbal practices with contemporary medical treatments. Dr Bahenda's perspective highlights a crucial intersection of traditional wisdom and modern science, suggesting a collaborative approach in future healthcare developments that respects and incorporates Indigenous knowledge while adhering to scientific standards and safety protocols. She expressed her concerns:

> *Sometimes I feel a bit worried about traditional treatment methods using plants. We don't yet fully know the side effects. For example, Bajakah wood is often reported by the media as a material that can be used in cancer treatment. However, it turns out there are various types of Bajakah wood, and we don't yet have a definitive understanding of each type and its function. Further research is needed.*

Despite her reservations about the integration of traditional herbal treatments with modern pharmaceuticals, Dr Bahenda wisely chooses not to prohibit the use of traditional medicine within the Dayak community. Similarly, Kakuring and Bahandang also refrain from prohibiting the use of herbal medicine. Bahandang said, "*Herbal medicine has been passed down through generations in the Dayak community*." Moreover, Dr Bahenda recognises that enforcing a ban could foster resentment and lead to a wider disengagement from modern healthcare services, potentially isolating the community further. Recognising the delicate cultural dynamics at play, Dr Bahenda opts to employ a cautious approach, advising her patients on the safe use of both medicinal systems. She routinely cautions them against simultaneous consumption of modern medicines and traditional herbal concoctions, recommending a gap of two to three hours between the two. This precautionary advice stems from the uncertainty surrounding the interactions of these treatments—while synergistic effects (where treatments enhance each other's efficacy) would be beneficial, antagonistic reactions (where one treatment undermines the effect of the other) could pose serious health risks. By advocating for this temporal separation, Dr Bahenda aims to prevent adverse interactions, ensuring that her patients

can benefit from both traditional and modern medical practices without compromising their health. This balanced approach not only respects the cultural importance of traditional remedies but also underscores the necessity of exercising caution when navigating the confluence of diverse medical philosophies. She remarked:

> *Usually, I always remind them by saying, "Don't take (medicine) at the same time, sir or ma'am; give them a minimum distance of 2 or 3 hours." I'm afraid that side effects will appear because we still don't know whether the effect is synergistic or antagonistic. If it's synergistic, that's okay, but if it's antagonistic, it means the opposite. Therefore, I usually advise them to allow a few hours between medical drugs and their traditional medicine (jamu) as a preventive measure.*

4.5.2 Local access to health

Health promotion and education initiatives within the Dayak community are typically implemented through various methods and media. In district cities, banners are a popular medium for conveying information to the local community. These banners, often located at road intersections, convey a range of information, from product advertisements to local events. In villages like Long Lanuk, banners are primarily used to communicate important information, particularly in the health sector, and are often created by the local government. For example, banners might provide post-flood education or information related to stunting issues. Babilem, who works in the public health sector, said, "*Promotional and educational health materials are usually provided by the government, following the themes and programs of the central government's health campaigns*."

In Long Lanuk village, the dissemination of health-related information has evolved to encompass both traditional and digital mediums to ensure comprehensive community outreach. Kakuring detailed how communication strategies extend beyond conventional methods such as banners and billboards, which are prominently displayed following significant health events or crises such as flooding. These visual aids, typically produced by the main health centre, keep the community informed about immediate and pressing

health issues, like nutritional stunting or post-disaster health advisories. As Babilem said, "*Visual aids are usually provided by the Department of Health and distributed by health workers to each village*." Complementing these traditional tools is the innovative use of digital technology, particularly through a WhatsApp group that includes all the residents of Long Lanuk village. This platform has become a vital channel for ongoing health education and communication. Monthly discussions within this group cover a variety of critical health topics, including coronary heart disease, hypertension, and diabetes. Kakuring actively engages with the community through this group, sharing timely and pertinent health information and advice, thereby fostering a well-informed community that can respond proactively to health challenges. This dual strategy of using both visual and digital communication tools broadens the reach and enhances the impact of health messaging in the village, catering to diverse preferences and needs. Kakuring explained:

> *The delivery of information is often done through banners, billboards, and sometimes people can find out the latest information. For example, yesterday, there was a banner related to stunting, and after the flood, there was a banner providing information related to post-flood. Making these banners is usually carried out by the main health centre. Apart from that, information is also conveyed via the WhatsApp (WA) group, which contains all residents of Long Lanuk village. Every month, I communicate within the group to discuss health and disease issues, including topics such as coronary heart disease, hypertension, and diabetes. I often share information related to this topic in the Long Lanuk WA group.*

Kakuring, in his dual role as a nurse and designer, emphasises the critical importance of effective communication in public health initiatives within the community. He believes that presenting health information in an engaging and visually appealing manner significantly enhances its accessibility, particularly in areas with low literacy levels. He advocates for the use of simple, clear, and visually engaging design elements that can immediately draw in the viewer and facilitate the comprehension of complex information. This approach is especially pertinent in his community, where the overall level of

education may not adequately equip individuals to navigate through dense or jargon-heavy textual information. By tailoring health communications to fit the local context and cognitive preferences, Kakuring asserts that critical health messages are not only disseminated but are also understood and potentially acted upon by the community members. Here are his opinions regarding this matter:

> *People prefer attractive designs that can grab their attention. Like this example [points to brochure], when patients come, I show this to explain the characteristics of cholesterol. So, people tend to be attracted to pictures, which are easy to understand. The design should be creative and easy to comprehend. Therefore, sorry, here the people have a low level of education [less literacy], so explanations are needed that are simple and easy to understand by local people. We have to promote or convey health information according to their knowledge, in accordance with what they know and understand. If we explain using information models that are difficult for them to understand, it will not be effective.*

While Kakuring hones in on the technical aspects of health communication, incorporating design and visuals to enhance comprehension, Mariang and other local figures I conversed with emphasise the crucial role of language in effectively conveying health information. Recognising that literacy levels significantly impact the accessibility of communicated messages (Nutbeam, 2000; Okan et al., 2016), the challenge is particularly pronounced in Berau regency, which houses a diverse tapestry of Indonesian ethnic groups, each with its own language. Mariang points out the necessity of addressing linguistic barriers in health education: "*It must be acknowledged first that there are limitations in communication and understanding of the language. Therefore, we usually use the language commonly used in the Dayak village."*

The reliance on native Dayak volunteers, who are proficient in local dialects and culturally attuned to the sensitivities of the village residents, proves essential. These volunteers not only speak the Dayak language but also possess an innate understanding of the most effective ways to engage with the community on sensitive health issues. This

linguistic and cultural congruence ensures that health promotion activities go beyond mere information dissemination; they become meaningful interactions that respect and incorporate local customs and communication styles. Mariang elaborates on the importance of this approach, especially when introducing health practices that might alter traditional behaviours: "*We cannot come and give instructions or forbid village people from doing things, such as [the need for] MCK (bathing, washing, toileting), in their place, or adopting a healthy lifestyle, even if the intention is good for their health*."

The MCK sanitation program , one of the main initiatives of the organisation where Mariang works, involves collaboration with various stakeholders at national and international levels. While running this program, Mariang and his team use a persuasive approach, such as creating health promotions through visual images. For instance, they created sanitation posters that convey information about the health risks caused by household waste, which can attract flies and contaminate food and drink, leading to diarrhoea. These posters were designed and printed by parties collaborating with the NGO where Mariang works (Figure 37 and Figure 38). This perspective highlights a fundamental principle in public health communication: the need for respect and empathy towards cultural norms and practices, ensuring that initiatives are not only understood but also accepted by the community.

Figure 37 Poster on sanitation
This poster advises individuals on the use of proper toilets to maintain your family's health (In Indonesian: *Gunakan jamban yang benar agar kesehatan keluarga anda tetap terjaga*).
The photo was taken in April 2023.

Figure 38 Poster about sanitation through handwashing.
This poster reads, 'Let's wash hands with soap' (In Indonesian: *Ayo cuci tangan pakai sabun*). The photo was taken in April 2023.

In her experience, Bahenda frequently engages directly with the Dayak community in the village to discuss matters related to village health. Despite the challenges of coordinating community gatherings because of residents' individual activities, Bahenda collaborates with village leaders and health workers (*manteri* and midwives) to convene residents in public places, typically at traditional houses. While addressing health issues, Bahenda recognised the limitations of verbal communication alone, especially when conveying complex information with technical terminology, thereby acknowledging the need for incorporating visual aids for clear and accurate delivery. Bahenda stated: "*Sometimes, if we only explain verbally without visuals, it can be challenging to illustrate what we mean clearly. Usually, we bring posters as visual aids that can be shown to the public when conveying information*."

As the digital media landscape continues to evolve, Bahenda sees the transformative potential of multimedia, particularly video, in health promotion strategies. Bahenda advocates for the use of succinct, engaging video content that efficiently delivers health messages, avoiding the pitfalls of lengthy or overly complex presentations that may disengage the audience. She envisages these videos as proactive tools to educate and inform local communities, particularly on preventative measures for prevalent or emerging health issues in their environment. For example, by introducing instructional content on the prevention and management of skin diseases before they become widespread in the Dayak village, these videos could significantly mitigate health risks. This approach leverages the visual and auditory engagement in the community and aligns with the increasing use of digital media usage in rural areas, ensuring that critical health information is both accessible and actionable. She articulates a clear vision for harnessing this medium:

> *Videos can serve as effective promotional tools, particularly short ones, in our view. Concise videos are acceptable. If we present information directly and in abundance at once, people are likely to become bored. The video could include preventive health information to assist locals in comprehending and addressing health issues in their community. For instance, before skin diseases surface in the Dayak village, information on preventing and managing these diseases can be demonstrated or explained through video.*

Furthermore, Bahenda underscores the importance of being sensitive to the needs of local communities, particularly in the realm of healthcare. She observes that local people are not yet fully acquainted with modern medicinal practices and health models, often relying on local treatment techniques and health perspectives. However, she also acknowledges the willingness of Dayak communities to embrace outside perspectives. She advocates for a persuasive approach with good intentions that does not dismiss the value of the local knowledge system.

4.5.3 Future, optimism

Looking ahead to the future health of the Dayak community, health workers express optimism. This positive outlook is grounded in their perception of the Dayak community's increasing receptiveness to modern medicine, as well as the now available health infrastructure in local communities. Kakuring reflected:

> *I am optimistic that the health and well-being of the Dayak people will continue to progress and enhance. Presently, I observe a positive trend in the health of the Dayak people. Historically, Dayak individuals tended to consult shamans rather than health workers, placing significant trust in them and frequently seeking treatment. However, with the ongoing process of modernisation, people are becoming more open to modern medicine and are increasingly visiting health facilities. Consequently, I am optimistic that the Dayak community is now experiencing improved development and health.*

This optimism is also echoed by other health workers who observe the improved connectivity between rural villages and cities, facilitating access for rural communities to receive treatment in urban areas. Bahandang and Mahilak shared the similar sentiments about infrastructure development. Bahandang stated, "*The presence of infrastructure such as health post buildings and ambulance transportation in the village greatly assists healthcare workers in providing health services*." The local government has introduced healthcare units, including ambulance services. Health workers f stress that the health of the Dayak community is intricately linked to the efficacy of the local government, which ought to persist in enhancing health facilities and infrastructure in remote communities but is currently characterised by disparities in distribution and availability.

Other health professionals, including Bahenda, contend that the future health of the Dayak community hinges on human resources. She anticipates an increase in the number of health workers from the Dayak community to bolster support for Dayak villages and assume pivotal roles within the local government's health department. Bahenda said, "*In the future, many Dayak villagers will pursue education in healthcare so that they can*

return to their villages to fill healthcare positions." The aspiration is to ensure that this will contribute a crucial voice in shaping health policies for Dayak communities in remote areas.

4.6 Discussion

In this chapter, I delve into the health practices, perceptions, and opinions of local community members, specifically exploring the current health design and the future of local health through the perspectives of local people (Table 4). The key research questions addressed are: How do Dayak communities incorporate daily health practices? Where do they seek health information when exploring alternatives beyond their community? How do they interpret health promotion materials when provided by health professionals from outside their community, and what factors should be taken into account when offering such support? Additionally, how do they envisage their future health and well-being? This section will elaborate on the responses to these inquiries, drawing from the outcomes of pe' siu via interviews with local people. To contextualise my study, I will also connect references to similar research studies.

Table 4 Summary of insights from interviews

Thematic insights	Description	Frequency	Probability of design action
Local health practices	Relying on local knowledge, such as using herbal plants	General	Provide alternative health systems that integrate local knowledge with medical sciences
	Acknowledging and believing in a spiritual sense and traditions, such as health ceremonies and shamanic practices	General	
	Confusion between modern and traditional practices in medicine	Variant	Co-design with local people through community participation, educating on both traditional and

			modern health practices
Health access and services	Infrastructure challenges, such as limitations in digital media technologies	General	Provide an alternative design based on local contexts that can adapt to infrastructure challenges
	Availability of health information, promotion and education	Typical	Design health programs that engage with local people to provide health information
	Limited healthcare services in remote areas	General	Co-design a policy framework involving local people and decision-makers
	Improving healthcare services through collaboration between private (mining companies) and public sectors or the government	Variant	Co-design initiatives between corporate and public entities
Future	Concerns about the health impacts of company operations	Typical	Provide a design platform (such as a design workshop) to discuss and create solutions with local people
	Optimism about health improvements from healthcare workers	Typical	
	Integration of modern medicine and local knowledge	Typical	
	Improvement of local human resources	Variant	

Note. *General* – core ideas resonated with all participants; *Typical* – core ideas in this category resonated with six to ten participants; *Variant* – core ideas in this category resonated with two to five participants.

4.6.1 Health practices

From local standpoints, health practices are intricately woven into the fabric of their Indigenous knowledge, passed down through generations. In their daily lives, the health practices of the Dayak people involve the application of traditional plant-based medicine

and spiritual beliefs. Such practices, rooted in traditional plant medicine and spiritual healing practices, have become integral to Indigenous communities globally. For instance, Aboriginal peoples in Australia use bush medicine and traditional healing among Aboriginal Australians for their treatment of cancer (Shahid et al., 2010), and Indigenous Quechua, Mestizo and Brazilian Amazon people use plants to treat malaria (Frausin et al., 2015; Guerra et al., 2006). Similarly, health-related spiritual beliefs are pervasive among Indigenous peoples, exemplified by the Inuit people who use medicinal plants in the boreal forest of Canada (Uprety et al., 2012).

In Indonesia, the use of traditional plant-based medicine transcends Dayak communities to encompass non-Dayak populations as well. The phenomenon of bajakah wood, a local plant from the Dayak region, for example, gained national attention following claims that it could cure cancer. Following the news, Bemanuk used bajakah to treat her father's cancer, which exemplified this trend. However, the diverse types of bajakah wood were not comprehensively understood at that time, as highlighted by medical doctor Bahenda, resulting in some confusion. Given the profound knowledge that the Dayak people possess regarding plants and herbs, it is imperative to develop frameworks that integrate sustainable local knowledge while synergising with modern medicine in Indonesia.

Dayak health practices are intricately woven with spiritual beliefs, forming a holistic approach to well-being that extends beyond the physical realm. Traditional healers, known as shamans or dukun, play a pivotal role in bridging the gap between the material and spiritual worlds. Healing rituals often involve chants, prayers, and the use of symbolic objects to connect with spiritual forces believed to influence health. Many Dayak people perceive illness not only as a physical ailment but also as a manifestation of spiritual imbalance. As a result, traditional health practices are designed to address both the physical symptoms and the spiritual disharmony underlying the condition. This holistic perspective reflects a deep understanding of the interconnectedness of the body, mind,

and spirit, emphasising the need to restore equilibrium for overall well-being. Dayak health practices underscore the significance of spiritual harmony in maintaining good health and illustrate the community's profound connection to their cultural and spiritual heritage.

Previous researchers have explored Dayak's healing practice facilitated by dukun (Bamba, 2017; Herrmans, 2021), interpreting this shamanic approach as a manifestation of power imbalances (Tsing, 1988). Additionally, Weinstock (1983) connected these practices to the Dayak Kaharingan religion. Most recently, the healing practices conducted by shamans gained prominence in 2021, particularly with the rise of Bu Ida Dayak, who is renowned for her use of alternative Dayak medicine, blending traditional and spiritual healing methods. Asep Suryana, a sociologist at the Jakarta State University, perceives the popularity of Bu Ida's health practices as indicative of Indonesian society's disillusionment with the conventional health system, leading to a preference for instant health solutions (SALAM, 2023).

In Long Lanuk, as in many remote areas of Indonesia, Dayak people are transitioning from traditional medicine to modern medicine. Based on the interviews I conducted, it seems that local residents are increasingly forsaking traditional healing practices in favour of modern medicine. Local health clinics have transformed into quasi-pharmacy stores, offering generic medicines that residents purchase when they fall ill. Unlike the health system in Australia or America, generic medicines in Indonesia can be obtained without a doctor's prescription. Additionally, there is a noticeable shift away from spiritual practices, as evidenced by the discontinuation of traditions like tattooing, which was typically performed to ward off evil spirits believed to be carriers of diseases.

4.6.2 Health access

The Dayak people often encounter significant challenges when attempting to access health systems, particularly in remote and rural areas (Jin, 2007). Geographical isolation and the lack of well-developed infrastructure pose substantial barriers, making it difficult for Dayak communities to reach healthcare facilities. Limited transportation options

further exacerbate the situation, hindering timely access to medical services. In certain instances, the nearest healthcare facilities are located far from Dayak villages, necessitating individuals to take long and arduous journeys to seek medical attention. The shortage of healthcare professionals in these remote areas compounds the issue, with insufficient medical personnel to meet the diverse healthcare needs of the Dayak people. These access challenges not only impact the prompt treatment of illnesses but also contribute to disparities in preventive healthcare and health education, highlighting the urgent need for targeted interventions to improve healthcare accessibility for the Dayak community.

Health information is disseminated to local communities through local health workers, with literacy playing a crucial role in effectively communicating health-related content. Dayak individuals prefer direct communication of health information, allowing them to seek clarification from information providers if needed. This preference is closely tied to their literacy level and comprehension of existing design products, such as health information posters. However, the language used in poster media can sometimes be challenging for locals to understand, and the visual representations may not always resonate with them and be out of date and inappropriate or poorly presented.

Local health workers recognise the importance of visual tools like posters to support health information. Drawing from their experiences interacting with Dayak communities, they emphasise the need for visual media to convey health material, both in direct communication and through intermediary media. Despite this, the design products available are predominantly centralised, limiting the variety of materials that health workers can distribute locally.

WhatsApp serves as a crucial medium for facilitating health access in Long Lanuk. Health workers at the Pustu Long Lanuk have found WhatsApp to be an effective and efficient distribution channel. They curate health information and share it with local residents through WhatsApp groups. However, the curated information is sourced directly

from Google search results and does not undergo a design process tailored to the local audience. Moreover, the WhatsApp network is dependent on internet connectivity and smartphone technology, which can be financially burdensome in rural areas where internet access is costly and not all residents own smartphones. Additionally, language diversity within Dayak communities, coupled with linguistic diversity in Indonesia, can pose challenges in communicating health information effectively (Gu, 2022; Loosemore & Lee, 2002). Therefore, clear communication strategies and materials tailored to local languages and cultural nuances are essential for effective health information dissemination.

At the village level, Dayak individuals generally do not harbour negative sentiments towards design products related to health information, as such materials are scarce in their communities. Consequently, Dayak people primarily rely on health workers appointed by the local health department in their villages when seeking health information. Additionally, they often share health-related information with colleagues and family within the Dayak community.

4.6.3 Local standpoints and human centredness in the scale

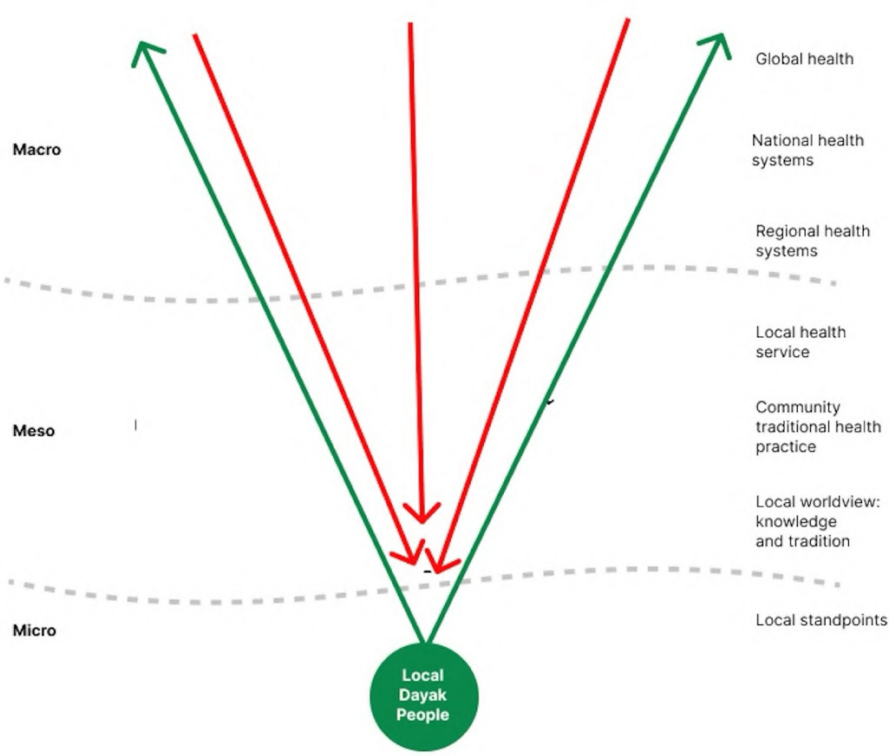

Figure 39 Situating local people at the scale of health systems.
Note: *Green arrow* – Local people's bottom-up perspective*; Red arrow* – Centralised health system's top-down perspective.

Figure 39 illustrates the reflection of pe' siu with the local community. This illustration showcases the central role of local individuals, emphasising human-centredness and depicting their perspectives and health world in an interconnected circle where they influence each other. I weave a common thread through various levels of analysis, spanning micro (personal), meso (community), and macro (national and global), providing profound insights into the processes involving the local community.

At the micro level, the situation of individuals such as Nek Kapat exemplifies significant barriers to healthcare access. Nek Kapat's limited understanding of health, shaped solely by her regional experiences, underscores a broader issue of informational isolation that many face in similar circumstances. This lack of awareness is compounded

by her unfamiliarity with essential healthcare products, including health insurance, which are critical for managing and mitigating health risks. The absence of such knowledge not only hampers her ability to seek and receive appropriate care but also reflects systemic deficiencies in health education and resource distribution within her community. This scenario highlights a pressing need for targeted interventions that enhance health literacy and accessibility at the individual level.

At the meso level, the Dayak community's approach to healthcare vividly illustrates the deep entwining of communal identity with local health knowledge and practices, passed down through generations. Traditional wisdom interwoven with modern medical systems is pivotal in shaping the healthcare landscape. For example, the Long Lanuk Sub-Community Health Centre (Pustu) embodies this blend by offering services that incorporate both Western medical practices and generic medications alongside traditional remedies. While this hybrid healthcare model is commendable for its inclusivity, it also raises critical questions about the efficacy, integration, and possible tensions between traditional and modern medical paradigms. The dual approach necessitates careful balancing to ensure that it not only respects cultural heritage but also meets contemporary health standards and needs effectively. This underscores the importance of culturally sensitive health strategies that are adaptable and responsive to the unique dynamics of each community.

The health centre serving the Dayak community illustrates the intricate balance required between traditional and modern medical practices. Here, traditional medicine, including plant-based remedies and spiritual rituals, remains integral to the Dayaks' approach to health, underlining a profound connection to cultural heritage. Although health workers at the centre acknowledge and respect these traditional practices, there is a persistent concern regarding the potential unknown side effects of such treatments. This situation underscores the critical necessity for effective synchronisation between diverse medical paradigms. At this meso level, fostering open dialogue and communication

between traditional healers and medical professionals is essential. Such efforts are vital, not only for bridging knowledge gaps but also for ensuring that integrated healthcare delivery is safe, respectful, and culturally competent, thereby enhancing overall community health outcomes.

At the macro level, the prevailing structure of the healthcare system, heavily predicated on modern Westernised scientific principles, marginalises local knowledge and experiences. This fundamental oversight in the healthcare architecture undermines its effectiveness in serving the needs of diverse communities. The design of the system, including the dissemination of health products and information about preventive services, often fails to resonate with or even reach local populations. This disconnect both impedes the accessibility and applicability of healthcare services and perpetuates a cycle of exclusion and inequity. It highlights the necessity for a more inclusive healthcare system design that integrates local knowledge and practices. Doing so would not only enhance the cultural relevance and acceptance of health services but also likely improve health outcomes by making these services more accessible and tailored to the specific needs of each community.

In the macro context, healthcare systems are ostensibly designed under the assumption of uniform infrastructure and resource distribution across regions. However, this idealised equality is far from reality, as stark inequalities persist, particularly in remote areas where inadequate infrastructure and limited resources are common. These disparities are further complicated by diverse socio-cultural conditions, leading to further healthcare challenges. The design of healthcare systems often fails to incorporate the voices and experiences of marginalised communities, neglecting their specific needs and conditions. To rectify this, it is imperative to incorporate local input into the healthcare design process, ensuring that systems are not only responsive but also oriented to the unique needs of these communities. By doing so, healthcare systems can become truly inclusive, offering effective services tailored to all, particularly those in remote and

marginalised areas, thereby engaging with these communities in a manner that respects and integrates their lived experiences and cultural contexts.

The inclusion of local voices in designing health systems is paramount for creating interventions that are responsive to the unique needs, beliefs, and contexts of specific communities (Barcham, 2022). Local communities possess invaluable insights into their own health challenges, cultural practices, and preferences, making their participation crucial for the development of effective and culturally sensitive healthcare initiatives (Wright et al., 1997). By incorporating local perspectives, health systems can enhance their relevance and acceptance, fostering a sense of ownership and trust within the community. Additionally, involving local voices promotes equity by addressing the diverse and often marginalised needs of specific populations. This ensures that health interventions are not following a one-size-fits-all approach but are tailored to the intricacies of the community, ultimately leading to more sustainable and impactful health outcomes.

4.6.4 Localised design intention in the voices

Broadly speaking, my research delves into the integration of Indigenous approaches alongside Human-centred Design (HCD), into the design of local health systems, as elaborated in Chapters 1 and 2. These chapters underscore the importance of incorporating local voices into the shaping of design intentions. This chapter describes how I utilised these approaches to inform the interview process, allowing me to discuss localised design intentions through the voices of the community.

One can consider the insights of Puyuuk, who participated in my interviews. As a lifelong resident of the Long Lanuk Dayak community, Puyuuk shared his goal of enhancing the health and welfare of his community through education and proactive health promotion. He proposed initiatives specifically designed to address the unique health challenges and cultural nuances of the Dayak community by integrating traditional knowledge with modern health practices. Puyuuk was acutely aware of the limited access

to formal health facilities in rural areas and suggested grassroots education campaigns as a viable strategy for overcoming this limitation. He envisioned, for example, designing regular community meetings to disseminate practical health information, from hygiene practices to recognising the symptoms of common illnesses. These sessions, which do not currently exist, could be tailored to the specific needs of the Dayak culture, perhaps using storytelling, a traditional method of knowledge transmission within this culture.

The local people highlighted the significance of preventive healthcare involving the use of natural and traditional medicine revered within their community. According to Dayak elders, promoting this understanding is crucial to reviving interest and trust in these ancient practices, in addition to corroborating their benefits with reference to modern health science. They recommended that discussions about preventive healthcare using traditional medicine could be conducted in village community meeting rooms, facilitated by local residents and health workers. This approach aims to blend old and new methods, ensuring that traditional practices are preserved and incorporated into daily health regimens.

4.6.5 Future

The Dayak people are currently grappling with uncertainty about their future. Many among the younger generation in the local Dayak community rely on local mining companies for employment as contract labourers. However, the impending closure of these mining operations, prompted by the depletion of mining supplies and expiration of land use permit contracts, casts a shadow over their prospects. In recent years, thousands have faced termination from their employment due to plans to close coal mining operations (Muliawati, 2023). This closure not only threatens the local economy but also raises concerns about the impact on health during the mine closure process.

Local people firmly believe that the environmental footprint of coal and palm oil companies indirectly takes a toll on their health. This belief is grounded in the dust generated by mining operations, which permeates the village and leads to respiratory tract

problems (ARI), as seen in coal exploitation areas in remote regions of western China (Chen et al., 2014). Moreover, water pollution emerges as a significant factor hindering access to clean water, particularly following industrialisation in the region. Clean water is pivotal for local health sustainability, aligning with the United Nation Sustainable Development Goals (SDGs) and contributing to children's health, as contaminated water can be a root cause of stunting. Therefore, the future health outlook of local people appears somewhat pessimistic, even though health workers remain optimistic about the improvement of local health as health facilities enhance their capabilities.

From these interviews, a design consideration that merits attention is the creation of a platform capable of accommodating local voices within a health context. In particular, it is essential to formulate health system designs that equip local people to withstand factors that could pose a threat to their health. For instance, following a mine closure, it becomes crucial to listen to local voices, comprehend their perspectives, and understand the type of health system they desire or require, one that aligns with their culture and lifestyle. Consequently, involving local people in the mapping and design of this system becomes imperative, especially concerning the agenda of fortifying local community health in the future.

The future of health in Indigenous communities presents a complex landscape of challenges and opportunities as efforts are made to address longstanding disparities and enhance overall well-being. Collaborative initiatives between Indigenous communities, governments, and healthcare organisations aim to prioritise culturally sensitive and locally-centred healthcare models. The integration of traditional healing practices with modern medical approaches is gaining recognition, promoting a holistic approach to well-being. However, ongoing challenges include addressing historical trauma, ensuring equitable access to healthcare resources, and incorporating Indigenous perspectives in policymaking. As Indigenous communities assert their autonomy in healthcare decision-making, there is hope for the development of sustainable, culturally grounded health

systems that empower these communities to define and achieve their own health goals. Education, community engagement, and the revitalisation of traditional knowledge are key components in shaping a future where Indigenous health is not only improved but also driven by the values and priorities of the communities themselves.

A story

So, if we look back at the history, the founding of this village was actually motivated by health factors. In the past, the residents of Long Lanuk village moved from village to village. Some of our figures were entrusted with conducting surveys in each existing village. These surveys took a very long time. They tried to assess whether there were any diseases affecting the residents. Health aspects were crucial, and if someone fell ill, they would move to another location. For example, they moved near the current Block 8 bridge, right on the coal mining operation block 8 helipad bridge. That's where they established a village.

However, there was an outbreak of disease, an epidemic that was considered quite deadly at that time. If I'm not mistaken, it was characterised by vomiting and possibly malaria and other illnesses. There was no cure for this disease, so they had to make the difficult decision to leave the place. Our figures, whom we knew as Kan Ngau, Yok But, and Jong Bahla, conducted surveys everywhere to find a suitable place to establish a village.

Traditionally, Dayak villages were located on the left side of the river, when viewed from downstream to upstream. They believed that it was easier to find sustenance there. They travelled to Nyapa, got sick there. They went to Feli, got sick there. They went to Beya, got sick again, and the same happened in Sutan Jio and Long Sai. Even downstream in the red area, people were getting sick. None of those places were suitable. Eventually, they moved from the red land to this current location, where they found that they were no longer falling ill. They started cultivating gardens and formed a close-knit community, although at that time, they hadn't officially defined whether it was a village or an administrative area. What was clear was that we were a closely connected group, like a family. That's why the name Long Lanuk village emerged, with its background related to the previous illness…

(Kanam, Long Lanuk Dayak leader, telling me a story)

CHAPTER 5 ENVISIONING LOCAL HEALTH IN A LOCALISED DESIGN WORKSHOP

This chapter offers a comprehensive account of a participatory design workshop conducted with local participants in Indonesia. It delves into the what, how, and why of the workshop, scrutinising its pivotal role in collaboratively engaging community members to envision the future of health systems. The workshop engages with the idea of Indigenous storytelling as a sensitive design approach to accommodate a respectful and welcoming way to envision the future. The results presented herein stem from interpreting, reflecting on, and analysing data collected throughout the design workshop involving nine local individuals. This approach accommodated their local knowledge and fostered a dialogical space for their aspirations regarding the design of health systems in their community. Additionally, the chapter unfolds the narrative of Madintang and her journey, which emerged from the integration of local participation in the workshop, elucidating on the challenges faced within health systems in rural areas. It advocates for the localisation of health system design, underscoring the importance of designing solutions tailored to specific community contexts. Furthermore, this chapter underscores the significance of reflecting on the contributions of a participatory design workshop from a local standpoint to understand the human-centred perspective in design for local health and the intentionality arising from these intersections—an aspect currently undervalued within the scope of this research inquiry.

5.1 Introduction

With some hesitation, Lian, a Dayak woman nearing the age of 50 approached Kakuring, a health worker, who was engaged in conversation on the entrance terrace of a local clinic with a *hatue*[8] she had never seen before in the Long Lanuk village. This Dayak woman was concerned about the well-being of her child, who needed to be taken to the local hospital for routine monthly check-ups. Unfortunately, she didn't have a personal

[8] *Lelaki* (a guy, male)

vehicle to transport them to the hospital, which is approximately a 2-hour journey by motor vehicle (car or motorbike). Walking, for them, was not a feasible option. Additionally, there were no public transportation choices available in her current area. Despite appearing hesitant, she agreed when the hatue offered her a ride. He explained that he would also be heading to town with Kakuring and intended to borrow his colleague's car as a mode of transportation.

At 6 am, Kakuring and the hatue arrived in front of her house, where [name] was ready with her child, waiting outside. The hospital they were headed to was the only one in this regency, serving a population of more than 250 thousand people, and was always crowded with patients and visitors. Kakuring calculated the time, anticipating that with a two-hour journey, they would reach the hospital by 8 am to secure a consultation queue number, which had to be booked on the spot. If they arrived after 9 am, the queue would be long, possibly extending to hundreds of people, making it likely that they would be unable to complete the administrative process, consult with a doctor, and receive treatment on the same day. Lian was determined to finish her son's routine monthly check-up in a single day. Otherwise, obtaining transportation back to the hospital in the county city would prove challenging. Moreover, if they had to stay overnight in the city, the question was, in whose residence would they spend the night?

At the hospital, while obtaining the queue number, she and her son were accompanied by Kakuring and the hatue. They encountered a Dayak man, another resident of Long Lanuk village. The Dayak man's wife was in the delivery room, giving birth to her first child. In a state of panic, he told Kakuring and the hatue that the village midwife had advised them to take his wife to a clinic in a neighbouring village. However, after an hour's journey to a birthing clinic in the neighbouring village, they were redirected to take his wife to the hospital, extending the travel time to almost two hours when her condition was critical.

That hatue was me. In my fieldwork in an Indigenous Dayak village in remote areas of East Kalimantan, I often encountered the challenging journey for local people to travel from remote areas to the hospital to access health services. As someone originating from this area, this experience is a familiar part of the health reality in the local community. Local people in remote areas in Indonesia share this experience with others. For local Indigenous people, this story is not unique. In other regions of the world, like in Panama, Carmen, an Indigenous woman, endured two days of agonising labour as she was transported to the nearest health clinic—a three-hour drive away—lying on a bed suspended high and carried by members of the community (Arrocha & de Esquivel, 2000).

Understanding individuals' experiences in accessing the health system is crucial for evaluating and improving the quality of services (Doyle et al., 2013; Richards et al., 2015). Yet, in the evolving landscape of health systems research, a perspective has often been overlooked: the trans-contextual experiences of local individuals within the structure of health systems. For a healthcare system to be robust and human-centred, it must be consistently delivered across the spectrum of health services people use as they progress through the journey, from seeking health services to achieving desired outcomes. Additionally, the experiences of local people's journeys within the health system are critical to understand but are still often disregarded in health research involving local communities. In reality, local communities have the right and are entitled to access health journeys that are culturally safe, of high quality, and responsive to their needs.

This chapter aims to understand local people's collaboration and participation in health via by asking how local traditional knowledge and its local storytelling approaches connect to the HCD perspective; the aim is to map the lifelong health journey with the local community members in envisioning the future. Via a design workshop, I explore the human-centred design perspective from the local standpoint among Dayak communities. Addressing this question is crucial, as local people navigate complex healthcare journeys from an early age. Their journeys may start in rural or remote areas and encompass both

similar and distinct challenges compared to those faced by others. Moreover, fostering collaboration and encouraging the active participation of local communities in this workshop signifies a commitment to including local voices. With the engagement of local individuals, Dayak communities are more likely to embrace and utilise health design outcomes, provided they not only find them visually appealing but also perceive them as reflective and representative of their cultural identity.

After providing a brief overview of the health journey mapping in the section below, I explain why and how I utilised the design workshop format to explore local community health journey stories. Next, a comprehensive explanation of the workshop implementation process is divided into three parts: pre-workshop, during the workshop, and post-workshop. This breakdown aims to offer detailed transparency in the workshop's implementation, providing a comprehensive overview for reference with written documentation regarding the workshop's execution with local people. Following this, the results and interpretation of the workshop are presented through the narrative of the Madintang story—a result of the amalgamation of workshop participants—and a designed journey map of Madintang. The concluding section of this chapter contains a discussion of the workshop's contribution to design studies and its limitations in the context of this study.

5.2 Health Journey Mapping

Journey mapping is a design practice to understand and visualise people's experiences across various touchpoints (Howard, 2014). In health, journey mapping is used to understand and analyse the complete trajectory of an individual's interactions with the healthcare system (Alvarez et al., 2020; Joseph et al., 2023; Reay et al., 2017). It involves documenting steps, from initial health-related concerns and the decision to seek care, to the various touchpoints within the healthcare system and the outcomes of those interactions. The mapping process aims to uncover the holistic experience of individuals, taking into account cultural, social, and environmental factors that influence their health-

seeking behaviours. This way not only provides a comprehensive view of the complexities within healthcare access but also serves as a powerful tool for designing more human-centred and contextually relevant intervention. Previous research suggests that by visualising the health journey, researchers and healthcare design professionals could identify patterns, challenges, and opportunities, ultimately contributing to the development of more effective and tailored healthcare strategies (Bartlett et al., 2022; Ku & Lupton, 2020; Reay et al., 2017).

In a local setting, local standpoints could play a pivotal role in health journey mapping, providing invaluable insights that contribute to a more nuanced and culturally sensitive understanding of healthcare experiences. In health journey mapping, the emphasis on local perspectives ensures that the design and implementation of health systems align with the unique cultural contexts, values, and traditions of the community, as argued by Koski et al. (2017) in their Canadian First Nations Community's journey mapping research. By actively involving local individuals in the mapping process, a first-hand understanding of the challenges faced by the community as well as the strengths and resources available is gained (Kelly et al., 2018). This collaborative approach not only enhances the accuracy of health journey maps but also fosters a sense of trust and engagement, as local people see their voices reflected in the development of potential healthcare solutions.

In this study, understanding and incorporating local people's standpoints in health journey mapping is essential for addressing disparities and tailoring healthcare services to meet the specific needs of the community, especially in East Kalimantan. Local people bring an intimate knowledge of their own health practices, belief systems, and community dynamics, which are critical factors influencing healthcare utilisation and decision-making. By acknowledging and respecting local standpoints, health journey mapping can identify cultural barriers to access, highlight possible community-driven solutions, and ultimately pave the way for more effective and sustainable health interventions. This approach not

only ensures that healthcare services are relevant and acceptable to the local population but also promotes a collaborative and inclusive model that respects the agency and autonomy of individuals within their health journeys (Bartlett et al., 2022).

Moreover, HCD perspectives are valuable when crafting meaningful and effective health journey maps for local communities. They have been implemented in health journey mapping research to understand the pharmacy health services field (Flood et al., 2021). By adopting a human-centred approach, the focus shifts from generic, one-size-fits-all solutions to understanding the unique needs, challenges, and aspirations of the local people. In the context of health journey mapping, this means placing the lived experiences of individuals at the forefront of the design process to ensure that the health system is not only tailored to the specific cultural and contextual nuances of the community but also actively involves local voices in the co-creation of solutions. Local people's perspectives can help to identify key touchpoints in their health journey, recognising moments of significance, barriers to access, and opportunities for improvement. This collaborative and inclusive methodology not only enhances the accuracy and relevance of health journey maps but also fosters a sense of ownership and engagement among the local population.

Adopting HCD perspectives in health journey mapping is crucial for local communities, as it empowers them to actively participate in shaping their healthcare experiences (Zhao et al., 2023). This approach recognises the diversity within communities and acknowledges that a one-size-fits-all model may not effectively address the unique needs of different groups. HCD places the focus on understanding the unique needs, emotions, and experiences of individuals within the health systems (Harte et al., 2017). Through collaborative mapping exercises, local individuals can share their insights, preferences, and challenges, leading to the identification of tailored solutions that resonate with their cultural and social context. Human-centred design not only captures the surface-level interactions within the health system but also delves into the emotional

and social aspects of the health journey, providing a holistic understanding. Therefore, incorporating an HCD perspective may ensure that the health journey map not only addresses the clinical aspects of care but also accounts for the human elements, fostering a more holistic and compassionate approach to health systems delivery.

5.3 Why Design Workshop Storytelling?

A few studies have addressed health journey mapping for people in remote or rural areas (Devi et al., 2020; Kirby, 2021). However, in those studies, the potential of design workshops in crafting health journey maps for remote areas often remains unexplored and overlooked. In the context of health design systems, especially in remote areas, there is a tendency to rely on conventional approaches or methodologies that may not adequately capture the intricacies of local experiences. Design storytelling workshops, with their emphasis on local community engagement and participatory approaches, are powerful tools (Simonsen & Robertson, 2012) that can bring to light nuanced insights crucial for effective health journey mapping. However, these workshops are sometimes sidelined in favour of more traditional, top-down strategies, missing the opportunity to incorporate the authentic narratives and perspectives of the local population. Overlooking codesign storytelling workshops risks developing health interventions that lack cultural sensitivity and may not resonate with the diverse and unique contexts of remote communities.

Design researcher Jacqueline Gothe advocates for a design approach that acknowledges the deep histories and ongoing presence of Indigenous peoples, focusing on respect, listening, and collaboration with Indigenous communities (Gothe, 2024). In her study, the design workshop serves as a space for respect, listening, and co-creation, offering local people a platform to share their stories, experiences, and dreams. These discussions translate into the design of health journey maps aimed at being culturally relevant and resonant with the lived experiences of individuals in remote areas. The workshop recognises that local community members possess an intimate understanding of their unique context, including geographic challenges, cultural norms, and community

dynamics. Engaging them in a collaborative design storytelling process can help unveil layers of information that might be overlooked in more conventional mapping exercises. In remote areas, where traditional top-down approaches may not fully capture the intricacies of local health experiences, design workshops empower individuals to share their stories, insights, and challenges related to healthcare. This participatory approach allows for a deeper appreciation of the complexities involved in accessing healthcare in remote areas, leading to the development of more effective and sustainable interventions that align with the needs and aspirations of the local population. In this context, the design workshop aims to serve as a bridge between the technicalities of health journey mapping and the rich tapestry of experiences that define health-seeking behaviours in remote communities.

5.4 Localised Participatory Design Workshop

In this section, I detail the the design workshop by elaborating on the preparation, during, and after the workshop. In the preparation phase, I provide details on the recruitment process, logistics, and materials. Subsequently, I report on the activities conducted during and after the workshop.

5.4.1 Preparation

While residing in Long Lanuk and conducting observations and interviews, I initiated the search for potential workshop participants. I disseminated information about the upcoming design workshop activities I would be conducting and expanded my network of contacts. Seeking assistance from the head of the local volunteer health workforce, I endeavoured to identify suitable candidates for participation. Ultimately, I received confirmation from 11 individuals interested in attending the workshop, although, unfortunately, three participants were unable to attend on the scheduled day.

Previously, section 2.4.3 Localised design workshop (in Chapter 2) briefly discusses a localised design workshop with local people engaging in the workshop. The participants were eight Dayak women from Long Lanuk village, all of whom are married with children aged between 35 and 50. These participants exemplify the multifaceted roles

played by women in rural communities, where they not only manage household duties and provide care for both their children and spouses but also engage in farming activities on local farms. In addition to these responsibilities, they operate the village shop, adding a commercial enterprise to their extensive list of duties. This scenario highlights the complex, layered lives of these women who seamlessly integrate the care of their families with significant economic contributions to their community. The inclusion of these particular women underscores a common yet often overlooked reality in rural demographics, where the confluence of domestic and professional roles paints a picture of resilience and multitasking prowess, essential for the sustenance and economic stability of their families and broader community.

Logistics. Two weeks prior to the workshop, I initiated preparations for logistical requirements. I procured workshop materials, such as post-its, cardboard, glue, tape, and pens, from a shop in the district town and transported them to an inland village. Additionally, I acquired a small printer to reproduce the visual prompts I had prepared. Due to the bulkiness of these items, I borrowed my colleague's car in the district city to facilitate their transportation to the village. Upon reaching the village, I discovered that the printer I purchased was too modern, lacking a CD drive for software installation. Consequently, I had to download the necessary application software from the printer's official website via internet. The challenge of accessing a reliable internet network for downloading large files compelled me to return to the town, where I stayed with an acquaintance who possessed a good internet connection for the download process.

Materials. In the workshop I conducted, I devised prompts adorned with postcard-sized visual cues. These captivating visual instructions drew inspiration from myriad sources, including photographs captured during my sojourn in the village and images curated from online platforms. The intention behind the careful curation of these prompts was to furnish participants with tangible tools, fostering engaging discussions and the seamless exchange of stories. The prompts included images that local people could relate

to, fostering a pleasant atmosphere for everyone to share their memories, stories, and thoughts during the workshop.

Scenarios and sketches. I crafted a scenario presented in the form of a timeline. This timeline highlights key points from the community's past, present circumstances, and envisioned future, serving as focal points for discussion. The underlying intention is to actively foster reflection among participants, prompting thoughtful consideration of the diverse experiences and perspectives held by individuals within the local community.

Within the scenario I prepared, a character named X stands as an empty canvas, ready to be shaped by the collaborative efforts of workshop participants. Throughout the session, I facilitated an interactive process, urging each participant to contribute to the design of X's journey, bringing together insights from all eight individuals involved. This character, X, emerges as a symbolic representation, a conduit personifying the collective local voices within the unique context of the workshop. By infusing diverse perspectives into X's narrative, the character becomes a living embodiment of the shared experiences and collective imagination of the community, creating a compelling and resonant story.

Rehearsal. To ensure the smooth execution of my workshop, I conducted a rehearsal by enlisting four friends to play the roles of local individuals. This virtual simulation occurred on Zoom, with my friends acting as workshop participants. The main objective was to assess the efficacy of three crucial tools: scenarios, timelines, and visual cues. Beyond that, the exercise sought to gauge the overall coherence of my discussion flow and the clarity of instructions. By mimicking the workshop environment, this rehearsal provided valuable insights, allowing me to refine and fine-tune elements of the session for optimal engagement and effectiveness during the actual event.

After the rehearsal, my friends provided invaluable feedback, underscoring the importance of a more informal language delivery infused with local dialects. They suggested clarifying by incorporating visual cues to elucidate concepts. Additionally, the pace of workshop discussions emerged as a focal point, prompting a recommendation to

slow down deliberately. This adjustment aimed to afford participants ample time for reflection and seamless sharing of their experiences within the scenarios I had crafted. These insights proved instrumental in refining my approach, ensuring a more culturally attuned and local-centric workshop that aligned with the community's dynamics and fostered a comfortable space for meaningful engagement.

5.4.2 During the workshop

In the early morning, I prepared the workshop space, considering the potential discomfort posed by the absence of air conditioning in a region where the local temperature often soared to 33 degrees Celsius. To tackle this challenge, I borrowed a portable fan from local health workers to enhance the overall comfort of the environment. Anticipating the participants' needs, I also organised a modest morning snack, given the workshop's schedule from 9:30 am to 12:30 pm. However, a minor hiccup arose when the lunch I had ordered from a local restaurant, to come after the workshop, failed to arrive. I asked a friend to help; he graciously picked up and delivered the food to the workshop location. It was important that the workshop be an enjoyable and meaningful experience for the participants, and lunch was to be a shared pleasure.

Around nine in the morning, participants started to arrive, greeted by a welcome as I ushered them to their seats and offered morning tea alongside the snacks I had prepared. Ayan, one of the attendees, informed me that Merasa, a potential participant, couldn't make it due to a family emergency in Bena village. Meanwhile, on the opposite side of the health centre building, I observed Beliu, who owned a shop in the village, closing her stall and making her way towards the community health centre where the workshop was scheduled. As she entered the workshop room, I curiously inquired about the closed shop. She explained, "*There is no one to look after it; my husband went to the paddy field, and my child went to school*." This unexpected insight into participants' daily lives added a layer of nuance to the workshop dynamic, emphasising the intricate balance between personal responsibilities and community engagement and participation.

Commencing at approximately 9:30 am, I began the session by outlining the overall agenda and carefully reviewing the consent form with the attendees. For transparency, I told them of my plan to videotape the workshop, capture audio recordings, and take photos during the event. To ensure informed participation, participants were then asked to sign the provided consent form; I wanted to establish an atmosphere of openness and mutual understanding within the collaborative learning space.

I then gave a detailed explanation of the scheduled activities for the workshop. To ensure active participation, I distributed stationery and post-it notes to the participants, underscoring the significance of their openness in sharing personal stories and experiences. When she saw the post-it notes, Pelay remarked, "*I have never seen this [post-it notes] before. If there are any leftovers, I would like to take them home after the event [workshop].*" I emphasised the collaborative nature of the session, asking attendees to respond thoughtfully to prompts and actively contribute to the design of the character X. I gave them instructions for engaging in various activities, including writing and placing the visual cues to the board.

When I presented a series of visual prompts featuring photographs taken around the area, one image in particular sparked an immediate response from Duhung. The photo, depicting the severe flooding recently experienced in the village, elicited a poignant reaction, as Duhung recognised the familiar, muddy inundation that had besieged their homes. She remarked: "*Wow, is this from the recent flooding in the village? My child was sick with vomiting for a month because of this flood. It's been flooding frequently lately. It's so sad; the children get ill. How muddy the water is, rising up to the houses like that."* Her words underscored the direct impact of these environmental calamities on the health and well-being of the village's residents, particularly the children, who are especially vulnerable to the consequences of such disasters. The frequent floods not only bring physical destruction but also pose significant health risks, as contaminated waters lead to diseases and prolonged ailments among the young population

As we explored various visual prompts, Laai focused on a particular image that depicted the cat's whiskers (kumis kucing) plant, a species once prevalent and cherished in the village for its medicinal properties. Reflecting on its current status, she said: "*That's kumis kucing plant. It's becoming rare now. It used to be commonly grown in the village as a traditional medicinal plant*." Her observation highlighted a troubling trend: the diminishing presence of a plant deeply embedded in the village's cultural and health practices. The cat's whiskers plant, known for its therapeutic uses as by local people—in treating kidney ailments, among other conditions—has become scarce due to environmental changes and perhaps overharvesting. Laai's comment underscored the broader issue of biodiversity loss and its implications not only for ecological balance but also for traditional healthcare practices that depend heavily on such native species. This shift not only represents a loss of botanical diversity but also a fading piece of cultural heritage, where knowledge and use of traditional remedies are at risk of vanishing with the plants themselves.

During the workshop, Beliu drew attention to a photograph that depicted the process of fogging, a prevalent method employed in her village to combat the surge of malaria-carrying mosquitoes. She expressed her concerns, remarking:

> *We were also worried recently about the rise in malaria mosquitoes… hopefully, there won't be more victims. We're puzzled about how to repel mosquitoes. We were told that the smoke from burning coal is effective at killing them. So sometimes, we collect bits of coal that fall off the transport trucks by the roadside.*

However, she also voiced a significant apprehension regarding the health implications of such practices, adding, "*However, we are also concerned that burning coal might adversely affect our respiratory health*." This commentary highlights a critical dilemma faced by the community: the need to address the immediate threat of malaria, which has historically plagued tropical regions, balanced against the potential long-term health risks

associated with inhaling coal smoke, a practice that could lead to respiratory issues. Her insights illuminate the complex trade-offs that rural communities often have to navigate in their efforts to mitigate health hazards using available resources, whilst also contending with the unintended consequences of such measures.

Ayan said, "*Ah, you've been active in taking photos around the village while staying here, haven't you?"* Ayan remarks and the comments above were instinctive responsive reactions to the photos shown during the workshop. The presence of these photos was a critical element in conducting the workshop. They facilitated the discussion process and provided reflections for both myself and the workshop participants.

During the collaborative workshop with local residents, we employed visual prompts that I had prepared to map out the health journey (Figure 40) specific to the local area. With eight participants, the session was marked by a lively exchange of ideas as each individual responded to the prompts and shared insights drawn from their personal experiences. This interactive process not only enriched the understanding of the local health landscape but also fostered a collective exploration of community health challenges and opportunities. The contributions from these participants have been invaluable in enhancing the depth and relevance of our health journey map, illustrating the power of community involvement in shaping health initiatives.

Figure 40 Health journey mapped with local people during a collaborative workshop.
The photo was taken in June 2023

Figure 41 The collaborative workshop discussing the Madintang story.
The photo was taken in June 2023

In the absence of chairs and tables, we sat on the floor for the duration of the workshop, which created a casual and relaxed atmosphere (Figure 41). Sului said, "*I am enjoying sitting on this floor. We don't have AC, and the floor feels cold, so it helps when sitting in this hot temperature*." This informality was enhanced by the fact that the participants were well-acquainted with each other, allowing for a comfortable dynamic where humour and laughter were interspersed with the sharing of even the most poignant stories. This blend of familiarity and ease facilitated a deeply engaging and productive environment, where discussions and creative exchanges flowed seamlessly. The ability to joke and share experiences candidly contributed significantly to the workshop's success, fostering a unique sense of community and support among the participants.

Despite a hiccup with some arrangements, swift action and local assistance prevented any impact on the participant experience. As attendees began to arrive, personal stories emerged that enriched the workshop's context, revealing the delicate balance community members maintain between personal responsibilities and collective engagement. The workshop, conducted on the floor in a relaxed atmosphere, utilised visual prompts to facilitate a dynamic exchange of insights, significantly enhancing our understanding of the local health journey. These discussions were not only critical for mapping health challenges but also for fostering a sense of community through shared experiences and collective problem-solving. The interactive and informal setting encouraged open dialogue and was pivotal in the success of this community-oriented initiative.

5.4.3 After the workshop

After a somewhat anxious wait, lunch finally arrived, providing a welcome break once the workshop concluded. As we gathered to share a meal, the conversation naturally gravitated towards familial ties. Ayan's son arrived at the end of the workshop. Pelay said, "*He is looking for his mother. Are there any lunch boxes left?"* I nodded and confirmed that I had prepared extra boxes of lunch. During this lunchtime, the mothers in attendance predominantly discussed their daughters and sons, as well as some stories and experiences that added a personal touch to the post-workshop gathering. The informal setting allowed for a deeper connection, emphasising the significance of not only the workshop content but also the communal bonds that were fostered during this shared moment of relaxation and nourishment.

Reflecting on this workshop, I find myself contemplating the resources utilised. My reflection delves into both logistical and human dimensions. Logistically, the challenges of conducting workshops in remote areas are prominent. The preparation of materials and media becomes crucial, considering the absence of full electricity and internet support, which urban offices typically enjoy. In these remote settings, reliance on manual

equipment and limited technological resources is imperative due to the difficulties in accessing the internet. This reflection underscores the need for adaptability and resourcefulness, recognising the unique demands of remote environments and the importance of tailoring workshop logistics to suit the specific conditions of such locales.

Moreover, the selection of the workshop location was important, with participant comfort a critical factor for the workshop's successful execution. Establishing a secure and comfortable environment is foundational for cultivating a respectful and ethical workshop atmosphere. In rural communities, where venue options are limited, discussions often unfold in a circle under a tree, aligning with local cultural preferences for shaded dialogue spaces. However, for workshops extending beyond an hour, the availability of accessible toilets for participants is a necessity. In the workshop I conducted, a basic toilet equipped with a manually filled water storage area was provided. Consequently, on-site water preparation before the workshop was necessary to ensure the functional usage of the toilet facility, addressing a practical aspect crucial for participant well-being.

I undertook this workshop independently, without assistance or assistant. Despite careful preliminary preparations, the actual workshop proved to be a more intricate undertaking than anticipated. Juggling participant arrivals, managing administrative tasks, overseeing logistical aspects, and documenting the workshop's proceedings demanded constant attention. At times, my focus wavered, particularly when facilitating discussions, as concerns about the functionality of my audio and video recordings intermittently surfaced. Furthermore, the absence of real-time photographic documentation became apparent post-workshop, and I discovered that my DSLR camera failed to record activities. Fortunately, the GoPro camera I had on hand successfully captured the unfolding events. As a precautionary measure, I also recorded audio using my phone, ensuring a backup to preserve the valuable insights and interactions shared during the workshop. This experience highlighted the multifaceted challenges inherent in solo

workshop facilitation, emphasising the need for meticulous planning and adaptability to address unforeseen hitches while ensuring the seamless capture of meaningful moments.

5.5. Interpretation

In this section, I present the outcome of the design workshop and its interpretation by describing Madintang and the health journey maps (Figure 42). X is the female character's name used in my prompt. As discussed during the workshop, we replaced the X name with Madintang. Below is the description of Madintang in terms of who they are, where they come from, what has happened to them, and what they envision for future health. Madintang becomes a composite persona representing the women in the workshop, serving as a voice for a holistic, localised health system and way of life that blends tradition with modern health care and lifestyle systems. After the below section, health journey mapping is presented.

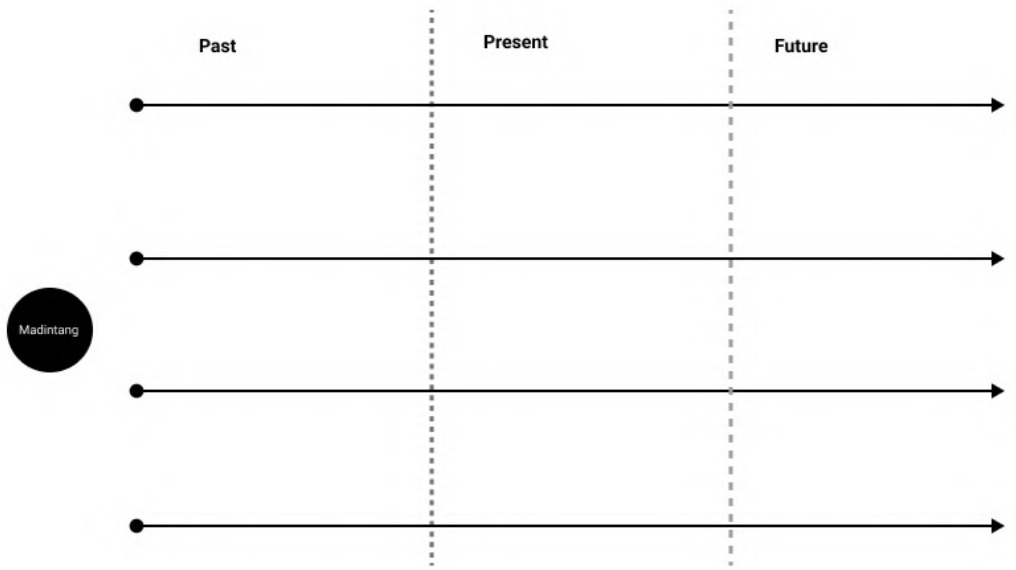

Figure 42 Digital sketch of Madintang's journey timeline.

5.5.1 Madintang and their journey health mapping

Madintang (Figure 43), a native Dayak woman, entered the world under the skilled hands of a village shaman, embarking on a health journey deeply rooted in the traditional

wisdom of her ancestors. Raised in a community that reveres the natural rhythms of the tropical rainforest, Madintang's childhood was steeped in stories about the healing art of using traditional health knowledge from Dayak tribal elders, passed down from generation to generation (Figure 44). These elders revealed the secrets of medicinal plants and shared narratives, connecting healing to spiritual harmony. Under the shade of towering ancient trees, young Madintang absorbed the teachings of their ancestors, learning to comprehend the language of the forest, subtle energies, and ancient rituals that form an integral part of the holistic well-being of their people.

Beliu recounts her experiences of being born and raised in a Dayak family:

> *The elders used to tell stories about Dayak traditions through songs. So, from a young age, we were taught to sing traditional Dayak songs and perform Dayak dances. What I remember most is the traditional etiquette concerning our relationship with nature and the teaching of the haring batang symbols. Simple rules about what was and wasn't allowed were ingrained in us, as our lives were deeply dependent on the forest.*

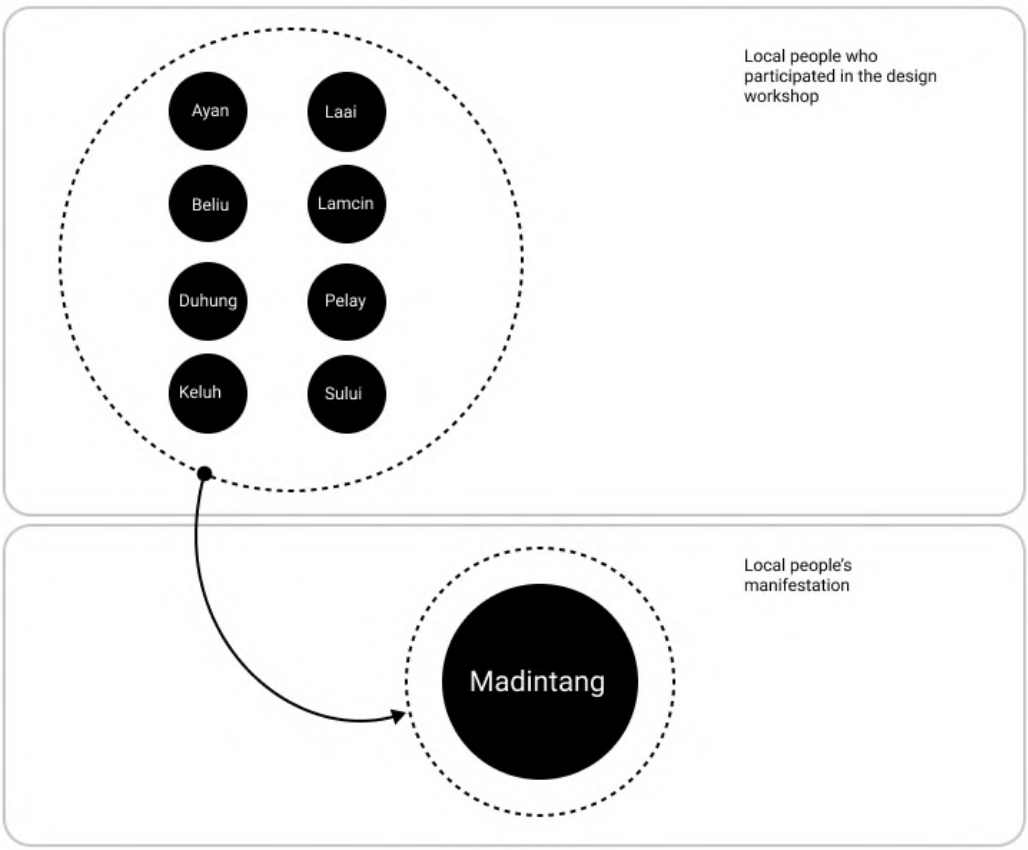

Figure 43 Madintang is created and designed as a manifestation of the local people who participated in this design workshop.

Figure 44 Illustrative figure of young Madintang.
Created by Author.

Madintang's engagement with traditional health knowledge is an intimate dance between nature and culture. The elders, adorned in vibrant traditional clothing, transmitted not only practical medicine but also a profound understanding of the interconnectedness between the physical and spiritual realms. Healing, for them, is not merely a physical process; it is a sacred journey that honours nature and celebrates the harmony between humanity and the environment. Guided by the teachings of their community, Madintang

serves as the custodian of this rich cultural heritage, embodying the wisdom of their Dayak ancestors in their approach to health and well-being.

Madintang grew up surrounded by ancient wisdom passed down from generation to generation by Dayak elders, but as they matured, changes swept through their community. The encroachment of modernity became apparent with the industrialisation of coal mining, spreading into the forests of Kalimantan. The scarcity of resources, the diminishing prominence of shamans, and the allure of Western medicine created a dilemma for Madintang, who was torn between the ingrained practices of their ancestral culture and the pragmatic solutions offered by modern health services.

Figure 45 An illustration of Madintang losing her baby.
Created by Author.

Madintang then faced a devastating loss when their baby died due to the failure of traditional health practices and the absence of a reliable healthcare system (Figure 45). Although the community still relies on traditional medicine passed down from generation to generation, Madintang's tragic experience reveals the limitations of this method in dealing with emerging health complications. Coupled with the lack of a robust healthcare system in remote villages, the absence of timely medical intervention for accidents and emergencies becomes a harsh reality.

Ayan and Duhung candidly admitted to the heart-wrenching experiences of losing their babies during childbirth, while Pelay shared the painful revelation of having suffered a miscarriage. Duhung proceeded to recount a story, drawing parallels between her own experiences and those of Madintang.

> *I didn't really know what happened. We didn't go to the hospital. All I know is that I lost the baby. The hospital is too far away. The road that connects this village to the city was just built recently. Before, we used a ketinting to travel to the local town which could take up to 5 hours.*

Madintang grapples with a profound sense of uncertainty as their village confronts the far-reaching impacts of coal mining and palm oil deforestation on the health of local communities. Once surrounded by dense rainforest, Madintang village now witnesses environmental transformations. The air, once redolent with the fragrance of diverse plants, is now tainted with dust and residue from coal mining. Sacred rivers, once a source of life, bear witness to the consequences of deforestation. Madintang's uncertainty extends beyond the impending environmental changes, encompassing the substantial impact they will have on the health and well-being of their community. With palm oil plantations encroaching on ancestral lands, disrupting ecosystems and traditional livelihoods, the

once-vibrant village of Madintang confronts a future shadowed by the complexities of environmental degradation and its toll on the health of the land and its people.

Amidst this prevailing anxiety, in this village, as for the Dayak people in general, there exists a future perspective where health is synonymous with harmony—a balance among society, the land, and the traditions that have safeguarded it for generations. Despite the encroachment of coal mining and the deforestation caused by palm oil cultivation, Madintang harbors a dream of a day when the health of their people will no longer be disrupted by environmental degradation. They envision a revitalised landscape where dense rainforests are restored and rivers flow freely, rejuvenating the ecosystem that serves as the cornerstone of the Dayak people's prosperity.

Madintang's dream extends beyond environmental rejuvenation; she envisions a future health system that seamlessly integrates traditional Dayak wisdom with modern healthcare practices. In her vision, traditional healers collaborate with Western medical professionals, combining ancient knowledge with contemporary expertise to holistically address the health needs of society. Community-led initiatives are rapidly gaining momentum, promoting preventive health services rooted in the Dayak cultural context. The norm is evolving towards easily accessible health facilities that respect local beliefs and values, fostering a sense of empowerment and inclusivity, especially for mothers and women. Lamcim asserted:

> *There is access to health consultations available for mothers and children, particularly during pregnancy. The importance of having access to health consultations extends beyond physical health; it also encompasses mental health. Additionally, we hope for the establishment of health recreation facilities, such as wellness salons. It's okay to dream, isn't it?*

In Madintang's visionary narrative, the health journey of the Dayak people transforms into a story of resilience and adaptation. Cultural practices are not merely preserved but are exuberantly celebrated, forming the foundation of a holistic approach to

well-being. Through education and collaboration, the younger generation emerges as torchbearers of ancestral knowledge, ensuring the perpetual continuity of Dayak traditions. Madintang envisions a future where their community thrives in the realm of health, where wounds resulting from environmental degradation find healing, and where the richness of Dayak culture is intricately woven into every facet of their collective well-being.

5.6 Discussion

In this section, I will discuss my research question: How does HCD perspective intertwine with local traditional knowledge and its storytelling methods within the context of health journey mapping via design workshop? Specifically, how do these elements collaboratively engage local community members in envisioning the future of health practices?

The incorporation of an HCD perspective in the context of a health journey mapping through a design workshop offers a unique platform for the intersection of contemporary design principles and traditional local knowledge. This interconnectedness could serve as a powerful catalyst for community engagement, enabling a collaborative and culturally sensitive approach to envisioning the future of health practices. In this study, the design workshop becomes a meeting space for the community's collective wisdom with a collaborative and participatory design approach. This is in line with the objective of this study, which aims to involve local voices in design and health research where these voices are still sidelined.

Barcham (2022) argues that the majority, if not all, of public health systems worldwide fail to meet the needs of Indigenous peoples because they exclude the knowledge of Indigenous communities. For this reason, the essence of the synergy in this study is the recognition of local traditional knowledge as a valuable source of insight, aligning with suggestions from previous researchers advocating for the incorporation of local knowledge in the development of health design systems (Fredericks, 2010;

Hernández et al., 2017). In this design workshop, community members are encouraged to share their stories and traditional health practices, drawing on wisdom gathered over generations. By acknowledging these practices in the health journey mapping process, the design perspective includes the nuances of cultural beliefs, rituals, and medicine that shape people's approaches to well-being. This inclusive approach aims to ensure that the resulting health journey map truly represents the lived experiences of community members.

Storytelling—an inherent part of many Indigenous cultures—plays a crucial role in this collaborative process (Corntassel et al., 2009; Pratt, 2019). In this study, the design workshop offered a flexible venue where community members could express their health narratives through storytelling. These stories not only contribute to the richness of the health journey map design but also serve as a means of preserving and disseminating cultural knowledge. These narratives become the common thread that weaves together individual experiences, connecting them to a broader cultural tapestry from a diversity of perspectives and enabling a more holistic understanding of health practices. In this design workshop, accommodating space for sharing stories in a participatory and collaborative manner also helps strengthen the role of storytelling as a model for a radical design approach that empathises with Indigenous communities (Barcham, 2021; Fernández-Llamazares & Cabeza, 2018). In previous studies, storytelling has been used to gain insight into the health experiences (Lamprell et al., 2018), fictional narrative of space (Dindler & Iversen, 2007), and experiences of using social media (Kankainen et al., 2012). In this study, storytelling makes a new contribution in the use of local experience stories in remote areas through workshops where all the stories of workshop participants are combined and amalgamated into a Madintang character design as a representation of local people.

In this study, the collaborative involvement of local community members in imagining the future of health practice was facilitated through a series of their inspirations

and dreams. Envisioning is a focal point in the agenda of Indigenous studies—aiming to help local people envision a future where they can overcome the present—often facing challenging situations, dreaming of new aspirations, and setting new visions (Smith, 1999). In this spirit of envisioning, workshop participants contributed their dreams and hopes to the design process, forming a health journey path based on their collective aspirations and needs, as outlined in Madintang's future journey. Their contribution places emphasis on local health systems, aligning with community institutions in determining the future direction of health practice. This collaborative visioning process goes beyond merely adapting existing practices; it involves the co-creation of innovative solutions that integrate modern design thinking with the community's cultural identity.

In essence, the health journey mapping design workshop becomes a dynamic space where HCD perspectives, local traditional knowledge, and storytelling converge to foster a shared vision for the future of health practice. This collaborative approach not only respects the community's cultural heritage but also empowers its members to actively participate in the design and transformation of their health landscape. The resulting health journey map, which reflects this symbiotic relationship, is envisioned as a visual narrative that honours the past, acknowledges the present, and inspires a collective and future vision culturally rooted in health practice. The implications of this study hopefully could serve as a reference for decision-makers and designers working on health systems for local people in disadvantaged areas, as well as scholars interested in design and health studies within the field of this research.

Moreover, in the participatory design workshop context, the concept of power literacy, as explored by Goodwill et al. (Goodwill et al., 2021), is relevant to this discussion. Power literacy concerns the nuanced complexities and inherent challenges of effectively managing power dynamics and a critical, yet often overlooked, aspect of participatory design—acknowledging and addressing the power imbalances that can skew collaborative efforts and outcomes. While participatory design aims to democratise the

design process, engaging stakeholders from diverse backgrounds and disciplines in a manner that promotes equality, the reality is frequently more complex. Designers, often positioned as facilitators or experts, might unintentionally dominate discussions or influence decisions, thereby perpetuating existing power hierarchies rather than dismantling them. However, the challenge extends beyond individual awareness and adjustment and encompasses the broader educational and institutional structures that shape design practices. Current design education and practice often lack a comprehensive focus on power dynamics, which can leave practitioners ill-equipped to recognise or address these issues effectively. Goodwill et al. paper suggests that to enhance power literacy among designers, this framework should be integrated into educational curricula and professional training to develop an understanding of power dynamics as a fundamental component of ethical design practice. Thus, the issue of power literacy in participatory design is not merely about adjusting the attitudes or practices of individual designers, but about transforming the structural and educational frameworks that inform design practice at all levels. This transformation is essential for realising the full potential of participatory design as a truly democratic and inclusive process.

In this study, the intertwining of HCD perspectives with local traditional knowledge and storytelling methods through design workshops is explored as a means to deeply engage local community members in envisioning future health practices. This hybrid of design theory and localised knowledge can be a potent catalyst for community engagement, facilitating a collaborative and culturally sensitive approach towards creating health journey maps that genuinely represent community members' lived experiences. Emphasising the critical role of storytelling, an inherent component of many Indigenous cultures, the design workshop offers a platform for community members to share health narratives, thereby enriching the design process and preserving cultural knowledge. This approach not only strengthens storytelling as a radical design methodology that engages

with Indigenous communities but also facilitates the collective imagining of future health practices, encouraging participants to contribute their aspirations towards developing innovative, community-centred solutions that resonate with their cultural identity. The concept of power literacy, as discussed by Goodwill et al. (2021), illuminates the complexities of managing power dynamics in participatory workshops. An understanding of power dynamics needs to be integrated into design education and practice to prevent the perpetuation of existing power hierarchies and to foster a truly democratic and inclusive design process. Ultimately, this study aims to showcase how a blend of HCD, traditional knowledge, and storytelling can foster a shared vision for the future of health practice, ensuring that the resulting health journey map serves as a visual narrative that is culturally rooted and collectively envisioned, potentially serving as a valuable reference for designing health systems that genuinely cater to the needs of local communities.

In the last section of this chapter, it is critical to note that journey maps and personas, commonly used in HCD, are seen as deeply embedded in a Western, individualistic design tradition that often clashes with the collective and relational values of Indigenous communities. Some argue that these tools, which focus on representing individual experiences or constructing hypothetical users, can inadvertently promote a "one-size-fits-all" approach, ignoring the nuanced, community-driven perspectives integral to Indigenous ways of knowing and being. In contrast to the Western emphasis on individual experience, Indigenous communities often prioritise shared knowledge and interconnectedness, where decisions and values are shaped by collective needs and reciprocal relationships rather than individual goals (Nakata, 2007). The application of such tools in Indigenous settings, without significant adaptation, risks imposing external frameworks that do not align with local cultural practices and worldviews. As scholars argue, tools like journey maps and personas, when used without consideration for the community’s socio-cultural fabric, can overlook power dynamics and marginalise local voices (Akama et al., 2019). These methods, which often flatten complex social

interactions into linear or simplified representations, fail to account for the tensions and relational complexities that shape Indigenous communities, reinforcing colonial paradigms of knowledge and participation (Agid & Akama, 2018; Akama et al., 2023). Therefore, while journey maps and personas can be useful in certain contexts, their application in Indigenous settings requires careful reflection on how they may reinforce power asymmetries and neglect the collective, emergent, and dynamic nature of Indigenous knowledge systems. While I acknowledge these viewpoints, I want to reiterate that in the workshop I conducted, the journey map served as an instrument to structure the stories shared in three main themes: the experiences from the past, the current present, and their envisioned dream of the future. In this chapter, I refer to related work, such as Simonse et al. (2019), which provides a clear example of how journey maps work in healthcare settings detailing each touchpoint. However, the way I use the journey map in this study setting is instrumental for the workshop, primarily to accommodate and amplify Indigenous voices through Indigenous standpoint and storytelling. In doing so, in Chapter 5, the outcome of the workshop is presented as written stories and illustrations, attempting to accommodate the local voices.

The cherry tree has become the preferred local *nongkrong* spot—a term that's a bit hard to translate directly into English but broadly refers to a gathering/hangout place, as noted by design researcher Alexandra Crosby (2013). Centrally located in the village, this tree serves as a convenient meeting point, and most importantly, it's situated in the area where the internet connection is strongest. Therefore, if one needs the best internet connection, as advised by a village youth, one should hurry to secure a comfortable seat under the cherry tree.

Figure 46 *Nongkrong*—sitting under a cherry tree
The photo was taken in May 2023

At night, the cherry tree is usually *rame*—bustling, serving as a venue for chatting, sharing stories, and enjoying the best access expected for engaging with social media. One evening, after attending a village event, I stopped to sit under the cherry tree with a local relative and opened a social media app on my smartphone. A friend on social media sent me a message containing a meme with an anecdote:

> A Martian encounters an astronaut in space and greets him: "Hello, my friend, this is my first time seeing you; when did you arrive on our beautiful planet?"
>
> The astronaut replies: "Yesterday."

> The Martian excitedly asks: "How long will you stay, my friend?"
>
> The astronaut responds: "Until tomorrow."
>
> The Martian then comments: "Oh, my astronaut friend, that is a very short visit; what did you come to do?"
>
> The astronaut quickly replies: "To write a book."
>
> Interested, the Martian asks: "That sounds exciting; what is the book about?"
>
> The astronaut replies: "Mars: Yesterday, Today and Tomorrow."

I couldn't help but laugh at the meme, and my local relative asked what was so funny. Without answering, I showed him the screen of my phone displaying the meme image. He shrugged and said, "I don't understand. What language is that? Is it English?”

CHAPTER 6 CONCLUDING REMARKS: TOWARDS LOCALISED DESIGN INTENTION AND FUTURE WORK

The concluding chapter presents the principal findings of each preceding chapter and elucidates their connections to the research questions and central argument of the thesis. It revisits the concept of localised design intention. It elaborates on the contributions this thesis has made to design research, Indigenous studies, health, and interdisciplinary academia. It discusses the overarching themes of this study while also addressing limitations and offering recommendations for future research endeavours.

6.1 Introduction

This thesis begins by illustrating the health challenges faced by Indigenous peoples in remote areas, and how their voices are often marginalised in discussions about their health. Throughout this thesis, I have explored the possibility of incorporating their voices from a human-centred design perspective and an Indigenous standpoint through a localised design intention. The essence of this locally-centric approach is to forge a new perspective rooted in localised design intention. My research has provided an understanding of Indigenous health in East Kalimantan, Indonesia, and offers insights into the regional health systems in Indonesia. In this final chapter, I present the answer to the overarching research question, recapitulate the main findings and recommendations from all research questions, discuss the limitations of my research, and propose ideas and suggestions for future research.

The guiding argument of this research is that when designing for local people, it is essential to consider how the views and voices of local individuals shape their own health, particularly when addressing and envisioning the future of local health in rural communities. Generally, the goal of this research is to unpack this argument through the lens of Indigenous standpoints (Foley, 2003; Nakata, 2007), by employing a blend of human-centred design concepts and local knowledge. In doing so, this study has

attempted to demonstrate how the design community could utilise an understanding of the relationship between local traditional approaches and health to create outcomes that address Indigenous health disparities and promote Indigenous well-being. To this end, this dissertation focuses on Indigenous and design approaches that merge into localised design intention, looking at how these approaches interact.

The aim I set out in the introduction was to investigate how local approaches to health might be considered alongside human-centred design approaches to design better local health systems for local communities. My thesis statement is that Indigenous approaches can be considered with human-centred design through design intentions that facilitate local standpoints in sharing their vision of a healthy future. As a framing device in this study, design intentions reflect local visions and dreams, as local people share their personal stories, experiences, and knowledge for better local health. To achieve this aim and support the thesis statement, I have used multidisciplinary perspectives from Indigenous, design, and health studies.

In this chapter, I synthesise all of my findings and highlight the considerations that should be made when embarking on Indigenous health design through the lens of Indigenous approaches. This synthesis will answer my overarching research question: How can the cultural, Indigenous approach towards local health be considered alongside the human-centred design, specifically with regard to Indigenous Dayak communities, and what are the implications of doing so? Throughout this research, I have sought to strengthen my thesis statement that Indigenous approaches can be considered along with HCD approaches through design intentions that facilitate local standpoints and share the local vision of a healthy future. In this study, localised design intentions reflect local visions and dreams: local people share their personal stories, experiences, and knowledge with the purpose of improving local health.

6.2 Towards Localised Design Intention

In the design field, an essential yet frequently overlooked aspect is the voice and intent of the studied community and its participants. Traditionally, the design process has been propelled by the vision and intent of the designer or researcher. However, I posit that in order to authentically embody the ethos of design and generate meaningful local design work, one must delineate or interpret participant and community voices through attention to *localised design intentions*. In doing so, we can redirect the focus from the perspective of the designer or researcher to that of the engaged community members, thereby mitigating the tendency of the designer's intentions to overshadow those of the community to which the given design is addressed.

HCD operates on the premise that individuals who will be affected by a design should contribute to its development. This acknowledgement stems from the understanding that a local society possesses invaluable insights, experiences, and needs that can profoundly shape the concomitant design process and its outcomes. Consequently, when discussing localised design intention, we underscore the context-specific character of local voices and intentions. Every community is distinct, moulded by its cultural heritage, historical backdrop, environmental setting, and social dynamics. Hence, by framing participant and community voices through localised design intention, we recognise and honour this distinctiveness, ensuring that design work meet the particular needs and aspirations on understanding the presence of design within the Dayak community. Chapters 4 and 5 concentrate on providing a platform for the voices of the Dayak people to express their experiences and perspectives. In this regard, Sanders and Stappers (Sanders & Stappers, 2008) argue that HCD and participatory design should prioritise the empowerment of communities and individuals engaged in the design process. Therefore, local participation though designers' localised design intentions makes possible the visibility of local voices. This approach nurtures a sense of ownership

and pride among participants, leading to the development of more sustainable and contextually relevant with local people.

In Chapters 4 and 5, I have framed the voices of local people through the articulation of localised design intention as a way to explore and discuss design from the local perspective. This approach supports shifting the focus from the intentions of the designer or researcher to the voiced needs of the local people; this has several significant implications. First, it encourages inclusivity and democratisation within the design process. Integrating participant and community voices through localised design intention fosters inclusivity and equity in the design process. Previous researchers have stressed the importance of amplifying the voices of marginalised or underrepresented communities in participatory design (Drain et al., 2018, 2019; Harrington et al., 2019). By valuing and incorporating such diverse perspectives and voices, participatory design can become more inclusive and responsive to the needs of all stakeholders; this can not only enhance the legitimacy and acceptability of the designed solution but also nurture a feeling of social justice and equality.

Second, framing participant and community voices through localised design intention can enhance the relevance and responsiveness of concomitant design; previous researchers have highlighted the importance of developing ideas rooted in community realities and priorities (Anderson-Coto et al., 2024; Barcham, 2021; Robertson & Simonsen, 2012b; Simonsen & Robertson, 2012; Wagner, 2018). While designers and researchers may harbour preconceptions or biases that can influence their problem-solving approach, if they centre their work around the intentions of the local community, they can be prompted to listen, learn, and adjust their designs accordingly. They can subsequently ensure that their work are grounded in the lived experiences and realities of the communities they aim to benefit, ultimately yielding more effective and sustainable outcomes.

Additionally, embracing a localised design intention encourages collaboration and co-creation between designers and community members. In this sense, design becomes a collective effort, a process in which diverse perspectives and expertise are valued and integrated. Such a collaborative approach not only drives innovation but also strengthens social cohesion and trust between stakeholders, laying the foundation for long-term partnerships and positive social change.

However, it is important to acknowledge the complexities and challenges involved in framing participant and community voices as a primary goal of localised design intention. For example, Ehn (Ehn, 2008) criticises participatory design, pointing out that power dynamics and unequal access to resources can influence the extent to which participants' voices are actually heard and valued in a designer's design process. Indeed, intentionality in participatory design necessitates a vigilant approach to framing participant and community voices effectively within the design process. As highlighted by Light and Akama (2012), facilitation plays a crucial role in participatory design practices, especially in nurturing the active involvement of communities. These scholars' work underlines the importance of the 'human touch' in design processes that seek to engage deeply with community contexts and needs. This human-centric facilitation involves more than just mediating discussions; it entails actively recognising and dismantling power dynamics that might skew genuine collaboration. The facilitator must ensure that all voices, particularly those from underrepresented groups, are heard and integrated into the design outcomes. This necessitates the creation of an environment where community members feel valued and empowered to contribute openly, enhancing the richness and applicability of the design projects developed.

In Chapter 5, I discuss the challenges of infrastructure and resources in conducting design workshops, such as the basic issue of inadequate toilet facilities at workshop venues in remote areas. This is also expressed by previous researchers, Dantec and DiSalvo (2013), who explore the concept of 'infrastructuring', which significantly enriches

our understanding of how publics form and engage within participatory design frameworks. These scholars argue that participatory design not only requires project-specific engagements but also involves the ongoing development of infrastructures that support sustained participation and dialogue. This approach is particularly effective in addressing the challenges identified by Ehn (2008) concerning power dynamics and resource access. By building infrastructures that facilitate ongoing engagement, designers can help balance power disparities and provide continuous local access to necessary resources, thus fostering a more equitable design environment. To be precise, infrastructuring helps in establishing a durable foundation for participatory design, making it possible to cultivate a responsive and dynamic dialogue with the local community that is essential for addressing complex and evolving community issues.

Clarke et al. (2021) further contribute to the discourse on intentionality in participatory design by examining the trust in co-design processes involving resource-limited community organisations. Their research underscores the critical nature of trust and mutual respect in enabling effective collaboration, particularly in contexts where resources are scarce and there may be a high level of scepticism towards external agents. Building on the insights from previous researchers (Clarke et al., 2021; Dantec & DiSalvo, 2013; Light & Akama, 2012) highlight the ways in which trust is not just a social contract but also a material practice that needs to be embedded within the design processes. This embedding involves ensuring that design interventions are sensitive to the socio-economic realities of the local community and that outcomes are directly beneficial to those involved. Such an approach not only mitigates the power imbalances highlighted by Ehn but also builds a stronger, more sustainable foundation for community engagement and participatory design.

Chapter 2.3 and the abovementioned perspectives argue for a nuanced and critically engaged approach to design that seeks to truly understand and integrate the voices of all local community members, particularly those who are often rendered

marginalised. This approach requires not only making design methods become more inclusive but also necessitates a fundamental rethinking of the roles of facilitators, the nature of infrastructures, and the essence of trust in design practices. Addressing these elements is crucial for overcoming the challenges of power dynamics and resource inequalities and creating truly collaborative and transformative design outcomes. Such a comprehensive approach is essential for tackling the prevalent challenges of power dynamics and resource disparities; it can ultimately lead to collaborative and transformative design outcomes that genuinely integrate and respect community voices, especially those of the traditionally marginalised.

In other words, the establishment of participant and community voices as integral parts of a localised design intention is essential to realising the full potential of participatory design. By prioritising the perspectives and needs of those directly impacted by design decisions, we can subsequently create design that are contextually relevant, socially just, and environmentally friendly. This shift in focus not only enriches the design process but also empowers communities to own their future and shape environments that truly reflect their values and aspirations.

The theoretical and practical implications of localised design intention, as explored in this research through the consideration of Indigenous methodologies alongside HCD approaches, present a compelling shift in design paradigms. Theoretically, this research underscores the crucial role of niat or intention within both Indigenous and design contexts, particularly highlighting the ethical, spiritual, and pragmatic layers that govern the concomitant local interactions in East Kalimantan. This emphasis on intentionality reorients design processes from being predominantly designer-driven to being collaboratively shaped with community inputs at their core. Such a shift not only challenges the traditional methodologies that often marginalise local voices but also aligns design intentions with the beneficiary community’s ethical and cultural frameworks. By foregrounding local narratives and aspirations, this research provides a nuanced

understanding of intention that integrates personal, societal, and spiritual dimensions, thereby fostering designs that are culturally sensitive and morally aligned with local community values.

Practically, this approach to design emphasises the participatory nature of creating the work that are genuinely reflective of and responsive to the needs of the Dayak community, which is the focus of this research. The implementation of localised design intention through participatory workshops and collaborative dialogues ensures that the design outputs are not merely functional but also deeply embedded within the Dayak community's local socio-cultural context. This becomes evident with regard to this research's collaborative development of health journey maps for the Dayak community, which were informed by comprehensive fieldwork and continuous community engagement. These maps, instead of merely serving as navigational tools, encapsulate the health narratives and cultural idioms of the Dayak community, thus enhancing its agency and ensuring that the suggested ideas are sustainable in the context of community's well-being. Additionally, by leveraging Indigenous knowledge systems alongside modern health practices, the collaborative health design approach facilitates a more inclusive health system that respects traditional healing practices and integrates them with contemporary medical strategies, thus improving health outcomes using a culturally consonant framework.

The synthesis of this research's findings also points towards significant design implications, particularly in design and health strategy. It suggests that design approaches should incorporate Indigenous methodologies not as peripheral elements but as foundational aspects that enhance cultural competence and ethical design practices. Furthermore, it asserts that health policies should be informed by insights derived from such integrated approaches, promoting health systems that are not only effective in terms of medical outcomes but are also equitable and culturally relevant. Ensuring the same requires a systematic adoption of design processes that prioritise local voices and

intentions, verifying that health interventions are co-created with the communities they aim to serve, and thereby fostering greater community trust and engagement.

Overall, the localised design intention approach calls for a methodological reorientation in design practices and also proposes a transformative framework for engaging with Indigenous communities. This framework should address the practical needs of these communities and respect their cultural specificities, thus contributing to a more holistic and sustainable design and development paradigm.

In this context, localised design intention represents a pivotal advancement in design knowledge by challenging the dominant Eurocentric perspectives in design and re-centring the design process around Indigenous approaches and design perspectives. This chapter illustrates the profound impact of integrating niat or intention, a cultural principle deeply embedded within the Dayak community, into human-centred health design approaches aimed at the improved health and well-being of this community. By shifting the locus of design intentionality from designers to the local community members, this study not only advocates for a democratisation of design processes but also enhances the ethical depth and cultural sensitivity of subsequent design outcomes. This approach foregrounds the specific aspirations and value systems of the Dayak people, ensuring that the health designs aimed at their well-being are not only functional and responsive to their needs but also respectful of their cultural contexts. Based on extensive fieldwork activities—comprising observations, interviews, and a design workshop—this research arrives at the idea of localised design intention that aims to extend the boundaries of design theory by embedding local perspectives at the core of design practice, thereby promoting more equitable, inclusive, and culturally congruent design processes that are critical for sustainable development within diverse sociocultural contexts. Such a reorientation towards localised design intention offers novel and significant theoretical contributions to design knowledge, emphasising the necessity of amalgamating

Indigenous wisdom and design approaches in order to achieve more holistic and impactful (health) design outcomes for local people.

Embracing locality design within the framework of design demands a profound shift in focus from designer-driven intentions to those that are rooted in community and participant voices. This shift is not only ethical but essential to the authenticity and effectiveness of the design outcomes. Specifically, the nuanced critiques by Ehn (2008) and others about power imbalances and access inequities highlight the urgent need for frameworks that do more than just listen to community voices and actively evaluate and integrate such voices as fundamental drivers of the design process. The concepts of infrastructuring, as discussed by Dantec and DiSalvo (2013), and the socio-materiality of trust explored by Clarke et al. (2021), collectively provide a robust methodology for building sustainable design practices that honour and utilise local intentions. These approaches make sure that designs are not only responsive but also responsible, that they acknowledge the socio-economic contexts and embrace the material realities of the communities to be apparently benefited by the same. By shifting the locus of design intentionality to the community, participatory design becomes a tool for guaranteeing empowerment, inclusivity, and social justice, enabling the creation of work that are genuinely provided by and for the community. This idea is not without its challenges, particularly in relation to dismantling longstanding power dynamics and ensuring continuous engagement. However, the potential for fostering equitable, innovative, and transformative design makes this rigorous, community-centric approach not only valuable but actually indispensable to the pursuit of meaningful and sustainable designs with effective social impact. Such critical engagement and the redefinition of relevant roles and processes could transcend traditional boundaries and offer a design blueprint that is truly collaborative and transformative.

6.2.1 Complexities and challenges

While I have highlighted several key points and nominated some key aspects for design research within Indigenous communities, I must disclose that the complexities and systemic nature of PD require deeper consideration of how participation is sustained over time and the infrastructures that support this engagement, especially in the context of the Dayak people in East Kalimantan. As Agid (2018) suggests, designing at the intersections of local, large-scale, and imagined infrastructures involves more than just immediate participatory engagements; it requires thinking longitudinally and institutionally. My study focuses on framing local voices through design research that aligns with the participatory design goal of inclusivity, but could benefit from learning insights on how these voices can influence long-term systemic change. Ehn's (2008, p. 96) critique of the limitations of workshop-based engagement points to the need for “design-after-design,” emphasising that systemic changes in community participation require continuous, evolving infrastructures that support sustained involvement. These infrastructures, as explored by Le Dantec and DiSalvo (2013) and Chopra et al. (2022), not only address power dynamics and resource access but also ensure that participatory design has a lasting impact on local communities, particularly when resources are limited. This study considers HCD and Indigenous standpoint via localised design intention is valuable, but extending this approach into institutional and infrastructural dimensions will provide a more robust framework for sustainable, community-driven design. Therefore, I suggest future study should address the complexities and challenges mentioned scholars such as Agid (2018), Ehn (2008), Le Dantec et al. (2013) and Chopra et al. (2022),

Moreover, the idea of localised design intention suggests a perspective in design studies by considering Indigenous methodologies alongside HCD, highlighting the cultural, ethical, and spiritual dimensions of community-driven design processes. This perspective underscores the importance of viewing localised design intention as a one of key aspects of participatory design, as it aligns design outputs with the cultural frameworks of the

community. However, the study could further engage with the concept of “institutioning” (Huybrechts et al., 2017, p. 151), which emphasises the continuous process of embedding design practices within local institutions and communities (Karasti, 2014; Teli et al., 2022). This engagement could address some of the limitations identified in the research, such as the challenges of building trust and mitigating power imbalances in resource-limited settings. By incorporating the infrastructural and institutional dimensions of participatory design, this research could contribute more critically to the understanding of designing health systems that are culturally relevant and also equitable, ensuring that local voices continue to shape the design ideas and process well beyond the initial workshop and prototyping phases. While this study does not engage with the concept of institutioning, as it could further push the idea of localised design intention, I suggest that future work could benefit from incorporating this concept when studying local design development.

6.2.2 Discussion on niat and localised design intention

To conclude this section, I discuss the context of the understanding of niat. This discussion on niat is divided into two points: the first is niat as a means of reflection and sensitivity for designers, and the second is niat as a way to listen to the intentions of Indigenous communities. The first discussion concerns niat as a form for reflection and sensitivity. In this case, niat is the key, a checkpoint, for reflection and sensitivity in design work, encouraging designers to continuously examine their assumptions, biases, and positionality in relation to the communities they are designing for (Akama et al., 2019; Öz & Timur, 2023). As a checkpoint, I argue that designers and researchers should ask the question, "What is my niat? What is my intention?" before approaching the community. This challenges us to move beyond preconceived notions of what works or what is needed, fostering a mindset of humility and openness. In addition, this reflection allows designers to question the power dynamics involved in the design process, particularly in relation to who has the authority to define the problem and the solution, enabling us to engage in deep, empathetic listening to truly understand the lived experiences, cultural

nuances, and values of the community. Furthermore, this understanding encourages sensitivity to the social, political, and environmental impacts of design, prompting us to consider how our work can contribute to long-term empowerment, sustainability, and equity. In this way, niat promotes a more conscious, responsible, and adaptive approach to design, where the needs and aspirations of the community are at the forefront, and our role is seen as that of a facilitator, rather than an imposer. As a form of reflection and sensitivity, the understanding of niat does not provide direct guidance on how we do design, but rather it directs us to consider how we reflect on our design within Indigenous communities in a sensitive manner based on the local culture.

The second discussion related to niat focuses on interpreting the intentions behind local ideas. In local conversations, the commonly used phrase is "saya berniat" (I intend) when envisioning an activity, an initiative, or before starting one. This reflects an understanding that niat can be a way to capture insights into local design ideas. For example, we can take insight from Puyuuk, a member of the Dayak Long Lanuk community. Puyuuk shared his views on improving the health and well-being of his community through education and proactive health promotion in his area. He proposed initiatives specifically designed to address the unique health challenges and cultural nuances of the Dayak community by integrating traditional knowledge with modern health practices. Puyuuk, born and residing in Long Lanuk, was acutely aware of the limited access to formal health facilities in rural areas. He suggested that grassroots educational campaigns could be a viable strategy to overcome this limitation. He expressed his intention to design regular community meetings where practical health information could be disseminated, ranging from hygiene practices to recognising the symptoms of common illnesses. These sessions, which currently do not exist, could be tailored to the specific needs of Dayak culture, possibly using storytelling, a traditional method of knowledge transmission within this culture. Puyuuk's niat to design these regular community meetings embodies the understanding of niat in localised design intention, where design directions

are given by and for the local people. This understanding provides direction for changing how we do design, where many designers approach Indigenous communities with a predetermined direction and purpose for the design, sidelining and oppressing local voices.

Therefore, I position that niat should be seen as a form for reflection and sensitivity, urging designers and researchers to critically examine the nature of their own niat. As Manuhuia Barcham (Barcham, 2023, p. 5) aptly reminds us that we must be more intentional and reflexive in understanding the culturally-specific ideas. This calls for a deeper awareness of our role as designers and researchers, recognising that our assumptions and intentions must be continually questioned. Furthermore, we must listen more attentively to the intentions of local communities, such as the Dayak in this study, and follow their direction in the design process. This approach not only honours their voices but also ensures that the design work aligns with their cultural values and aspirations, rather than imposing and oppressing external perspectives.

6.3 Summary of Findings

In this dissertation, I have detailed the work undertaken to address my overarching research question: How can indigenous approaches and human-centred design approaches be used to improve health systems in local communities, and what are the implications of doing so? To answer this question, I conducted a series of studies as part of my fieldwork. This included participant observation (Chapter 3) to explore communal aspects within the design conditions and current state of health systems in local communities. I carried out interviews employing a pe' siu (sharing stories) approach with local individuals who were vocal in sharing their experiences, stories, and aspirations (Chapter 4). Additionally, I facilitated a participatory design workshop, drawing on my insightful observations and interviews, to foster discussion and the exploration of ideas through storytelling. This workshop aimed to help the design of local health services in future (Chapter 5). Finally, I synthesised my findings and articulated them within the

framework of localised design intention, proposing a community-based health system that incorporates the voices, ideas and dreams of the local populace (Chapter 6).

This chapter concludes the thesis by summarising the theoretical and practical contributions of this research, as well as the achievement of its objectives and its results. In this chapter, I begin with a summary of the answers to the research questions and the findings of the research. Following this, I discuss the knowledge contributions of this thesis, elaborating on its theoretical, methodological, practical, and empirical contributions. Next, I address the challenges and limitations encountered during this dissertation, reflecting on the obstacles related to the fieldwork, logistics, and research outcomes. I then propose recommendations and future research directions informed by this study. The chapter concludes by providing a comprehensive conclusion to my research.

This research adopts an Indigenous standpoint as a lens to incorporate marginalised voices. It simultaneously uses a HCD perspective to explore the concept of designing health systems. The key findings are as follows.

Exploration of local health systems (RQ1): What are the circumstances emerging from the current health systems in local communities, and how can these circumstances be analysed and understood from the Indigenous standpoint alongside a human-centred design perspective? The dissertation's response to the first research question explores the community's health practices and scrutinises them under the dual perspectives of the Indigenous standpoint alongside HCD. The findings from three pivotal case studies illustrate diverse yet interconnected facets of the community's health-related experiences. These include initiatives like malaria fogging, the Posyandu nutrition program, and the utilisation of visual aids in health education. The concept of kebersamaan or togetherness emerges as a critical cultural lever in understanding and navigating these systems, suggesting that communal solidarity is both a reflective and practical tool in health system navigation.

Incorporation of local voices (RQ2): How do local people practice health, access health systems, and imagine their future health, and what does it mean in a broader health systems context? Response to this second question focuses on the operational and experiential realities of health practices as perceived by the local Dayak people and their health workers. By employing the narrative technique of'pe' siu (sharing stories) in Chapter 4, this part of the study captures and respects the oral traditions of the Dayak people, positioning their anecdotal and experiential narratives at the heart of health system redesign. This approach not only enriches the dataset with nuanced local knowledge but also repositions local voices at the core of the health system's developmental matrix.

Design implications and localised intentions (RQ3): How can considerations of the Indigenous standpoint alongside human-centred design be applied when designing local health systems, and what implications emerged from this exploration? The third question investigates the application of these culturally nuanced insights into the practical design of health systems. The discussions and outcomes of a participatory design workshop, detailed in Chapters 5 and 6, advocate for 'localised design intention'. This idea redefines the framework of traditional health systems by rooting them in the specific needs, aspirations and cultural contexts of the Dayak community, thereby promoting systems that are not only effective but also culturally congruent.

For a better understanding, I will review summaries and chapter-by-chapter findings. Chapter 1, the introductory chapter, set the stage for the dissertation by outlining the research questions and objectives, as well as the theoretical and methodological frameworks guiding the study. This report provided an overview of the Dayak community, highlighting the specific geographical and cultural context of the study, and emphasising its significance throughout the research. The researcher's opinion was clarified, underscoring the commitment to transparency and reflexivity during the research process. This chapter also outlined the research journey and timeline, establishing the foundation

for a detailed exploration of the subsequent chapters, each of which is briefly reviewed to prepare the reader for the comprehensive study that follows.

In the second chapter, I reviewed and synthesised relevant literature across various domains, including Indigenous standpoint, human-centred design, and health. The literature review focused on the marginalisation of local voices in healthcare design systems, which is a problem that often results in services being unable to meet the needs of local communities. This chapter proposed the amalgamation of these marginalised perspectives through tailored approaches that respect and incorporate local knowledge and cultural practices. It presented the findings of the literature study on the gaps in current research and practices, establishing a theoretical and methodological framework aimed at blending localised design intention with broader design studies to ensure that the healthcare design systems are culturally relevant and effectively meet the needs of local communities.

Chapter 3 explored local health delivery systems through the lens of kebersamaan or togetherness, which is a pivotal concept in the Dayak community's approach to health and communal well-being. Based on my seven months of fieldwork, including participant observation and extensive photographic documentation, three main cases were studied: malaria fogging initiatives, the Posyandu child nutrition program, and the use of visual aids in health promotion. In this chapter, each case study highlighted the challenges and innovations of local health practices. The malaria fogging activity demonstrates the community's proactive steps against malaria but also underscores the resource limitations they face. The Posyandu program reflects the local government's efforts to involve the community in combating child malnutrition, and also reveals weaknesses in health access and literacy. Lastly, the use of visual aids illustrated the local government's efforts in facilitating health education, and showed the need for local input and the lack of local representation in these visual aids. Chapter 3 argued for the importance of integrating local perspectives in the design and implementation of health systems to ensure they

meet the actual needs and conditions of the community. The concept of kebersamaan is presented not only as a cultural understanding effort but also as a practical strategy that can support community health advancements based on togetherness and collaboration.

In Chapter 4, I examined the current state of health systems from the perspectives of the local Dayak community and its health workers, emphasising the importance of hearing their opinions regarding the health systems that exist in their lives. Through semi-structured interviews with 15 participants, including Dayak community members and local health professionals, this chapter provides rich narratives that depict the community's health conditions and experiences. The main themes include healthcare accessibility, traditional health practices, and the community's visions for future health system improvements. The term pe' siu, which means to share stories attentively, frames the chapter's approach to understanding and documenting the intricate details of local health narratives and experiences. By amplifying local voices, this chapter contributes to the broader discourse on Indigenous and HCD perspectives, arguing that local insights can significantly enhance the effectiveness and appropriateness of health systems designed for rural and indigenous communities. These findings underscore the importance of grassroots community engagement and the potential for community-based innovations in the design and implementation of health systems.

In the fifth chapter, I provided a thorough analysis of a design workshop conducted with local community members in Indonesia. The workshop aimed at rethinking the future of health systems. It leveraged Indigenous storytelling, a method that aligns with the culturally sensitive contexts of the participants, to foster a constructive and inclusive design process. The outcomes of this workshop, derived from comprehensive reflections on the collected data, illustrate the potential of participatory design in incorporating local aspirations and knowledge into health system planning and implementation. The narrative of Madintang highlights the common challenges within rural health systems and the transformative potential of locally tailored health system designs. Chapter 5 emphasised

the importance of local context in designing health products and explores the dynamic interaction between human-centred design perspectives, local knowledge and local storytelling. This exploration underlines the significance of participatory design in understanding and implementing health systems that are not only functional but also culturally aligned and supported by the local community with localised design intensity.

This chapter, Chapter 6, revisits the concept of localised design intention. It further elaborates on the contributions this thesis has made to design research, Indigenous studies, health and interdisciplinary academia. Additionally, it discusses the overarching themes of this study while also addressing limitations and offering recommendations for future research endeavours.

From the summaries and findings outlined in the chapters above, this study highlights the fundamental need to include local voices in the design of health systems, a practice traditionally neglected in health system design and implementation. By applying Indigenous standpoint alongside HCD perspectives, this study explores how these approaches can significantly enrich the design.

These chapters collectively support a paradigm shift towards more inclusive design practices that not only recognise but prioritise the unique perspectives and needs of local communities. This shift is crucial for creating health systems that are not only technically efficient but also culturally sensitive and supported by the communities they are intended to serve. This approach promises to support health outcomes that are more equitable and sustainable, offering valuable insights to researchers, designers, and health practitioners working within diverse cultural contexts. This study contributes to academic knowledge and provides a practical guide for implementing more responsive and inclusive health system designs globally. I will discuss these contributions further in the following sections.

6.4 Contributions

6.4.1 Theoretical contribution

This dissertation makes a theoretical contribution to design fields by considering Indigenous perspectives alongside HCD perspectives to examine local health systems. Focusing on the Dayak community in East Kalimantan, this study highlights the potential for effectively addressing local health challenges by leveraging insights from those who are directly impacted. This approach not only enriches the theoretical framework within the disciplines of health and design but also initiates the application of localised design intention.

The theoretical shift in this research lies in its advocacy for a paradigm shift towards a local lens in design practices. This dissertation argues that understanding and integrating local community perspectives, especially those marginalised in system planning, can lead to more effective, meaningful and sustainable health system for local people. The inclusion of Indigenous methodologies—positioned alongside human-centred design—expands design theory into a domain that not only recognises but actively incorporates cultural and contextual specificities. This research offers a firm perspective in design, particularly in health systems, requiring deep engagement with local contexts and knowledge systems. This engagement can be facilitated through the concept of localised design intention, emphasising the importance of basing the design process on the intentions, needs, and aspirations of the local community. This reconceptualisation challenges traditional design paradigms that often overlook the complex realities faced by indigenous communities, thus setting a new standard on how design and health systems research can be conducted in a culturally attuned manner. Overall, the theoretical implications of this dissertation are profound, suggesting that the future of design may rely on its ability to adapt to and resonate with local and Indigenous contexts, thereby broadening its disciplinary impact and relevance.

6.4.2 Methodological contribution

This dissertation enriches design research methodology by applying local terminologies and cultural concepts alongside established design research methods to explore and enhance health systems within the Dayak community of East Kalimantan. This application is crucial as it not only enriches the research framework but also ensures that the methodologies used are deeply rooted in the contextual reality of the community studied

By utilising local terms such as kebersamaan (togetherness), pe' siu (sharing stories), and niat (intention), this study goes beyond mere translation and uses these concepts as fundamental principles that inform and guide the research process. This approach allows for a deeper understanding of local health systems from an insider's perspective, ensuring that the research findings are culturally relevant and practically applicable. Additionally, the use of participatory design techniques where local community members are active collaborators challenges traditional researcher-participant dynamics and fosters a creative environment where local insights and experiences are valued and prioritised.

Therefore, the methodological contribution of this dissertation lies in its ability to seamlessly combine Indigenous knowledge systems with an HCD approach, setting a precedent for future research in design and health that strives to be truly inclusive and representative of local needs and conditions, thus breaking away from the full reliance on dominant Western methodologies. Moreover, this approach not only increases the cultural sensitivity of the research to local indigenous traditions but also accommodates the direct involvement of local communities in voicing their perspectives in the exploration and solution-making processes that have been marginalised.

6.4.3 Empirical contribution

The empirical contribution of this dissertation is highlighted in my seven-month qualitative fieldwork within the indigenous Dayak community in East Kalimantan. In terms

of context, scope, and approach, this research is unprecedented in its efforts to document and analyse the dynamics of local health systems in Indonesia. Thus, this study provides valuable empirical data that elucidate the challenges and design perspectives within the health systems, which are still largely marginalised in broader health and research design discussions. By engaging the community directly through observation, interviews, workshops, and in-depth fieldwork, this research captures a range of insights about local health practices, beliefs, and challenges faced by the Dayak people. This approach not only enriches the empirical foundation of the research but also ensures that the findings are based on the experiences of community members, thereby providing a strong basis for developing culturally and contextually appropriate design interventions. Furthermore, the empirical data collected and reported in this research can serve as a crucial resource for academics and practitioners in the fields of health and design who are interested in this domain. This study contributes significantly to the empirical research in design studies, particularly in contexts that are typically underrepresented in academic literature, thus making a substantial contribution to the global discourse on localised health system design.

6.4.4 Practical contribution

This study informs critical practices, particularly in the context of designing systems that fully support local health. Incorporating local perspectives transforms traditional design briefs into dynamic, culture-based design intentions that reflect the needs and values of the local population. This approach is crucial in transitioning from top-down health system designs, which often overlook local specifics, to bottom-up designs that are co-created with and by the community. The participatory design process ensures that the resulting health systems are not only technically sound but also align with local traditions, practices, and expectations, thereby enhancing their effectiveness and sustainability.

Moreover, by documenting and reporting these local insights, this dissertation provides an example of how health systems could be co-designed with indigenous communities. This approach is geared towards a more equitable, democratic, and context-sensitive method of planning and implementation of health services. It encourages health system designers and policymakers to rethink how health systems are conceptualised, urging a shift from universal models to more local and responsive frameworks. In doing so, this research not only contributes theoretical insights but also offers practical strategies that can be immediately adopted and adapted by communities such as Dayak in East Kalimantan.

6.5 Challenges, Limitations, and Lessons Learned

This research faces specific challenges and limitations that can affect the scope and application of the findings. These limitations primarily relate to logistical challenges, resource constraints, and the focused scope of the qualitative inquiry discussed in this section.

First, I will discuss the logistical and resource challenges. Conducting fieldwork in remote Indigenous communities such as Dayak in East Kalimantan presents significant logistical barriers. This includes difficulties in accessing remote areas, limited availability of technological tools, and potential natural obstacles (such as unpredictable local flooding). Additionally, resource limitations also restrict the scope of data collection methods and the breadth of data that can be gathered. Such constraints may lead to reliance on fewer data collection devices and techniques, potentially impacting the depth and diversity of insights collected.

Secondly, this dissertation employs a qualitative methodology, which, although it provides deep insights into the perspectives and experiences of the Dayak community, limits the generalisability of the findings. The qualitative approach is designed to offer deep contextual understanding rather than broad generalisations; therefore, the conclusions drawn are inherently specific to the community studied and may not be

directly applicable to other Indigenous contexts without modifications. Moreover, the intense focus on one community and the deep diverse exploration of its local health systems means that this study may not capture wider regional or national trends in the design and implementation of other health systems.

Despite these limitations, the focused research approach allows for detailed exploration of complex issues often overlooked in broader research scopes. By delving deeply into the specific experiences of the Dayak people and the systemic issues affecting their health systems, this dissertation provides valuable case-based insights that can influence larger-scale health system reforms. These insights are particularly valuable for researchers, policymakers and designers who aim to integrate Indigenous perspectives into health systems planning and design effectively and respectfully.

Reflectively, through my research on Indigenous Dayak health, I learned the importance of deeply engaging with the community and approaching research as a collaborative, rather than extractive, process. One key lesson was the value of patience and flexibility—building trust and fostering meaningful participation takes time and requires adapting methods to fit the community's context. I also learned that considering Indigenous knowledge systems with academic frameworks enriches the research, making it more relevant and impactful for the community. These lessons have profoundly shaped my approach to future research. I plan to prioritise participatory methods, ensuring that research questions, designs, and outcomes are co-created with the community. I will also continue to focus on cultural sensitivity and inclusivity, recognising that local knowledge and perspectives are essential to creating sustainable design. Additionally, I aim to enhance the transparency and accessibility of my research, ensuring that findings are shared with the community in a way that is useful and meaningful to them.

6.6. Recommendations and Future Directions

This research provides fundamental insights that could pave the way for more inclusive and responsive healthcare practices, especially among marginalised Indigenous

communities. Here, I discuss several recommendations that not only refine current practices but also provide directions for future research.

6.6.1 Recommendations for practice

In this section, I discuss three recommendations for design practices that are drawn from this research. First is enhancing participatory design processes. To improve health system outcomes, designers and policymakers need to institutionalise participatory design processes that involve local communities from the conceptual stage. This approach extends beyond traditional consultation by embedding active participation in decision-making and design phases, ensuring that the systems developed are truly reflective of and responsive to local needs and contexts. According to Sanders and Stappers (2008), participatory design not only facilitates more relevant and effective outcome, but also empowers communities, giving them a sense of ownership over the resulting systems. Research Sherry R. Arnstein (Arnstein, 1969) on the ladder of citizen participation, highlights the importance of genuine stakeholder involvement in all stages of the design process, from ideation to implementation, to achieve systems that are both equitable and effective.

The second is to learn from and design with local knowledge. Designing health systems that incorporate local cultural practices, languages, and traditional knowledge is crucial. This amalgamation not only fosters community acceptance but also enhances the effectiveness of the health systems in addressing specific local health issues. Researchers emphasise that culturally congruent health services improve patient care and compliance while reducing disparities in health outcomes (Brach & Fraser, 2002; Handtke et al., 2019). Local knowledge systems, as discussed by Antweiler (Antweiler, 1998), could offer valuable insights that can significantly inform health system design, particularly in areas such as medicinal practices, health rituals, and community health worker training. By utiliinsg this local wisdom, systems can be tailored to meet the actual health needs and preferences of the community.

Lastly, design adaptation. The design principles and methodologies developed should be capable of adapting to diverse Indigenous contexts. While the specific details and cultural nuances will inevitably vary from one community to another, the core framework that considers indigenous viewpoints and HCD should be versatile enough to serve as a model for broader application. This scalability ensures that successful interventions can be replicated and modified as needed across different regions, thereby extending their impact. Manzini (2005) argues that scalable and adaptable design solutions are essential for sustainable community development, suggesting that frameworks which incorporate flexibility and context-awareness from the outset are more likely to succeed on a larger scale. Furthermore, Larry J. Zimmerman (Zimmerman, 2006) provides a methodological approach for developing adaptable design systems that can be customised to fit the unique cultural and societal structures of various Indigenous populations.

6.6.2 Future research directions

In this section, I will discuss future research directions that could be undertaken based on my reflections from this dissertation. These directions include: conducting comparative studies, integrating design and technology, developing local ideas, and designing policy frameworks.

Comparative design studies. Future research should adopt a comparative methodology to explore the application of similar approaches across diverse Indigenous populations worldwide. This strategy will allow researchers to identify both universal themes and distinct, context-specific factors that influence the application of human-centred and Indigenous design principles. Comparative studies in this vein can significantly enhance our understanding by juxtaposing how different cultural, social, and environmental backgrounds impact design methodologies. Previous research that has discussed the value of comparative studies in cross-cultural research could provide a foundational methodology for such inquiries (Duan et al., 2021; Genkova et al., 2022).

Additionally, scholars have emphasised the importance of Indigenous knowledge systems, which can further inform these comparative analyses, offering a richer, more nuanced understanding of Indigenous methodologies that transcend geographical and cultural boundaries (Huaman & Martin, 2020).

Design and technology integration. Investigating the integration of modern technology within traditionally structured health systems presents a promising avenue for future research. This exploration is critical in determining how digital tools and platforms can be customised to align with local languages and cultural contexts, thereby enhancing the effectiveness of healthcare delivery. For example, the research could explore the adaptation of mobile health technologies in rural areas, examining their usability and accessibility among rural populations (Mechael, 2009; O'Sullivan et al., 2022; Schoenberg et al., 2021). Such studies could follow frameworks suggested by Unertl et al. (Unertl et al., 2016), who outlined methods for integrating technology in ways that respect and enhance local cultural practices. This area of research promises not only to improve health outcomes but also to facilitate greater access to healthcare services through culturally sensitive technological solutions.

Development of local ideas and concepts. There is a substantial opportunity for future studies to focus on the creation and expansion of design ideas and concepts originating from local communities, particularly those in the Global South, which are often underrepresented in design literature. This research could build upon the concept of endogenous development (Long & Arce, 2000; Ray, 1999), which advocates for the development of concepts originating from local contexts and knowledge systems. By emphasising the importance of local creativity and innovation, such studies could enrich design vocabularies and expand the body of design knowledge. Researchers like Chambers (Chambers, 1998), who promote participatory development, could offer methodological insights that ensure these local ideas are accurately captured and effectively integrated into mainstream design practices. Ilaria Vanni and Alexandra Crosby

(Vanni & Crosby, 2023) underscore the significance of place in design, encouraging researchers to engage deeply with the local while acknowledging the global interconnections that shape spaces.

Policy framework development. This research argues for the importance of centring Indigenous perspectives to improve health outcomes for communities. It offers contributions to knowledge across disciplines beyond design, such as social policy, and can inform policymakers on including Indigenous voices in policy development. Therefore, it opens opportunities for further research in this domain to develop policy frameworks that better facilitate the incorporation of local perspectives into the design of health systems at both regional and national levels. Such frameworks should ensure that local design initiatives are not only implemented but are also supported by comprehensive and enabling policy environment. The work of authors like Walt and Gilson (Walt & Gilson, 1994), who discuss the intricate link between health policy frameworks and implementation, provides a critical foundation for understanding how policies can be structured to support localised health initiatives. Future research in this area should aim to propose actionable, evidence-based policies that are specifically tailored to support Indigenous approaches alongside HCD within health systems.

6.7 Conclusion

Discussion on Indigeneity in Southeast Asia and the Global South. Some scholars observe that the discourse surrounding Indigeneity in academic contexts has predominantly focused on the experiences of Indigenous peoples in the CANZUS states (Canada, Australia, New Zealand, and the USA), as highlighted by the significant body of Indigenous data from these countries (Taylor & Kukutai, 2016). Consequently, the diverse and rich Indigenous cultures and challenges in other parts of the world, including Southeast Asia and the Global South, are often sidelined (Ambole, 2020; Gutiérrez, 2020; Ullah & Ming Yit Ho, 2021). This emphasis can largely be attributed to the global dominance of English in academic scholarship and the colonial legacy of the CANZUS

states. As former British colonies, these countries have significantly shaped the academic world's understanding of Indigenous issues, particularly through the use of English as the primary language of instruction in education and academic scholarship (Benson & Conolly, 2004; Fandiño-Parra, 2021; Pennycook, 1998). As a result, academic scholarships surrounding Indigeneity, rights, and culture often overlook the other realities of Indigenous peoples outside Western contexts. For instance, in this context, the Dayak people of East Kalimantan, Indonesia, have their own worldviews and social and systemic structures that may not always align with Western definitions of Indigeneity. The colonial history of Southeast Asia and its ongoing impacts on Indigenous communities are often overshadowed by narratives centred on the struggles of Indigenous peoples in the CANZUS states. This gap in academic discourse perpetuates a narrow and often homogenised view of Indigenous experiences, failing to account for the diverse contexts in which Indigenous peoples navigate their identities and systems.

Indigenous scholarship should continue to expand and broaden the conversation to include the Southeast Asian region and the Global South. Within this context, this study adds a unique perspective from Indonesia to the existing discussions. The inclusion of Indigenous Dayak voices in their views on health and wellbeing, for example, colors the prevailing notion of Indigeneity as solely a Western-centric concern and contributes to a more diverse and global understanding of Indigenous rights, culture, and knowledge systems. In this discussion, it also attempts to diversify the academic understanding of Indigeneity and highlights the importance of local contexts in shaping health, governance, and societal structures. The recognition of Indigenous standpoints from regions such as East Kalimantan can inspire more inclusive, culturally relevant approaches to design, development, and policy, diversifying both Indigenous communities and the broader global discourse on Indigeneity. This thesis, therefore, adds a standpoint in moving Indigeneity from the periphery of academic and the conversations to the centre, urging scholars and practitioners alike to expand their approaches and recognise the voices and perspectives

of Indigenous peoples outside the Anglo-American context. To continue the conversation surrounding Indigeneity in Southeast Asia and the Global South, future research should be amplified to hear more voices from Indigenous peoples from non-CANZUS countries.

Conclusion. In this dissertation, the intricate dynamics of local health systems, viewed through the dual lenses of Indigenous standpoint alongside HCD, are unpacked. This journey commences with a critical inquiry into the existing health systems within local communities, seeking to understand these systems' circumstances from a nuanced perspective that honors both Indigenous wisdom and the principles of HCD. This exploration reveals the profound significance of kebersamaan or togetherness, not just as a cultural value, but as a vital strategy in navigating and enhancing health systems from the ground up.

By exploring the practices, accesses, and future aspirations of local health within the Dayak community, this study highlights the narratives of those often pushed to the margins. The use of pe’ siu, a local term that encapsulates the act of sharing stories, acts as a respectful conduit to capture and elevate these narratives, positioning them as crucial knowledge within the broader framework of health systems design. This approach not only places local voices at the heart of health system discussions but also emphasises the transformative potential of unifying Indigenous perspectives with HCD to develop health systems that are truly responsive and inclusive.

The subsequent chapters build on this foundation, presenting a participatory design workshop that offers a concrete example of how these principles can be applied in real-world settings. The engagement with local community members through this workshop not only showcases the tangible implications of this research but also proposes the concept of localised design intention. This idea sets the reorientation of local voices as fundamental in the knowledge, intent, and guidelines of health system design, paving the way for the creation of health systems that are more attuned to the specific needs and contexts of local communities.

Despite the insights and contributions of this research, it is not without its limitations, primarily stemming from logistical challenges, resource constraints, and the inherent nature of qualitative inquiry. However, these limitations do not detract from the study's value; instead, they highlight the need for continued exploration and adaptation in the pursuit of health systems that genuinely reflect and serve the diverse needs of all communities.

Looking ahead, this dissertation lays out several recommendations for both practice and future research. These include enhancing participatory design processes, incorporating local knowledge, and ensuring scalability and adaptability to inspire a shift towards more equitable, culturally sensitive, and sustainable health systems design. Furthermore, it calls for comparative studies, longitudinal impact assessments, technology integration, and the development of local ideas and concepts, outlining a roadmap for future inquiries that can build upon the groundwork laid by this research.

In conclusion, this dissertation not only contributes valuable theoretical and methodological insights but also provides a practical blueprint for reimagining local health systems design. By weaving together the threads of Indigenous wisdom, HCD, and participatory practices, this research advocates a localised design intention that is deeply respectful and reflective of the rich tapestry of human diversity. Through this work, a vision for a more inclusive, responsive, and human-centred approach to health systems design emerges, promising a brighter, healthier future for Indigenous communities and beyond.

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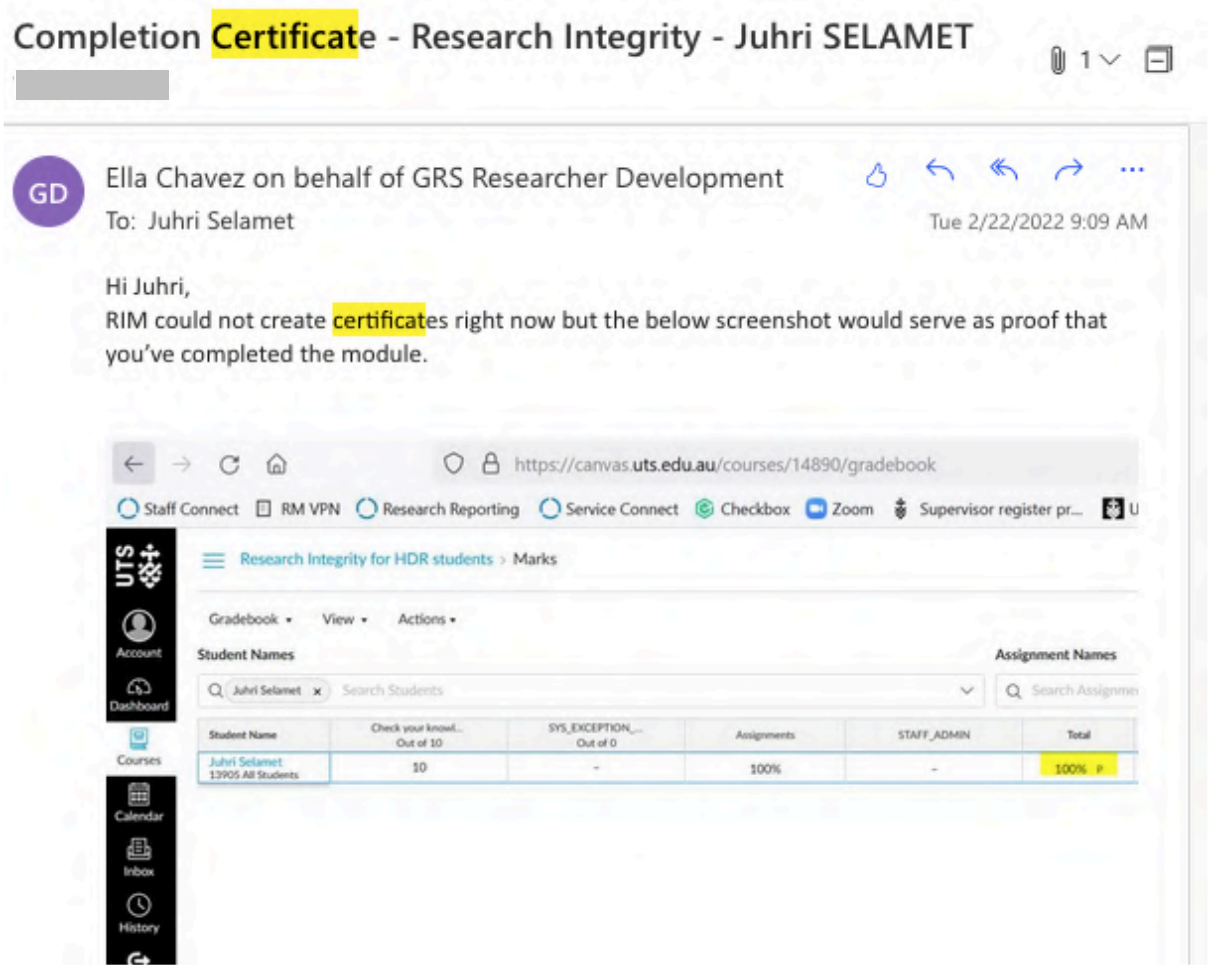
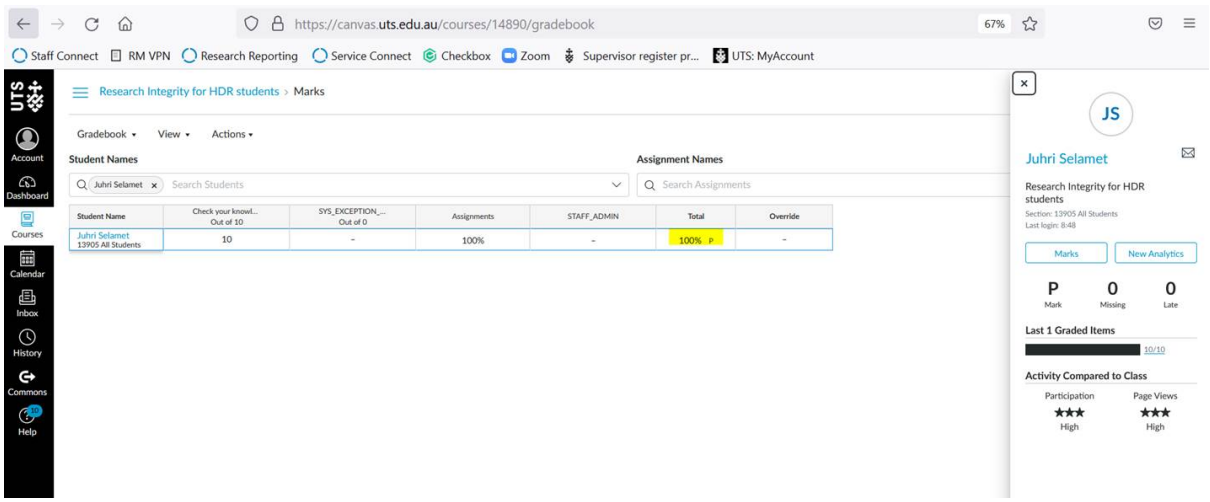
APPENDICES

Appendix A: Consent Matters Certificate #

Appendix B: Research Integrity Training Completion # [redacted]





Mandatory Research Integrity Training updated per Spring 2023

Confirmation of Mandatory Research Integrity Training Completed

Sensitive

GD

Francoise Png on behalf of GRS Researcher Development

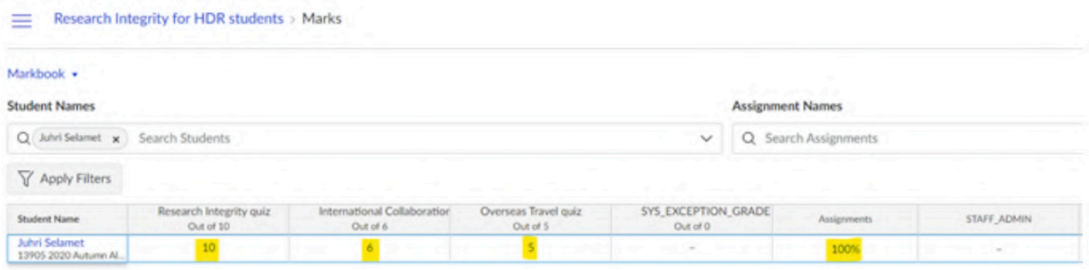
To: Juhri Selamet

Tue 9/12/2023 10:16 AM

Hi Juhri,

Thank you for completing the two additional mandatory Research Integrity modules.

The screenshots you attached can serve as your proof of completion, however, I have also attached the below for your records:



Please let us know if you have any questions.

Thank you.

Kind Regards,
Francoise

Appendix C: Ethics HREC Approval Granted - ETH21-6375

HREC Approval Granted - ETH21-6375

Research.Ethics@uts.edu.au <Research.Ethics@uts.edu.au>
Mon 12/12/2022 9:33 AM
To:Research Ethics <research.ethics@uts.edu.au>;Alexandra Crosby <Alexandra.Crosby@uts.edu.au>;Juhri Selamet <Juhri.Selamet@student.uts.edu.au>

1 attachments (404 KB)
Ethics Application.pdf;

Dear Applicant

Re: ETH21-6375 - "Envisioning the Future: Applying Indigenous Approaches and Human-Centred Design (HCD) to Design for the Promotion of Health in East Kalimantan"

Thank you for your response to the Committee's comments for your project. The Committee agreed that this application now meets the requirements of the National Statement on Ethical Conduct in Human Research (2007) and has been approved on that basis. You are therefore authorised to commence activities as outlined in your application.

You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all UTS policies and guidelines including the Research Management Policy.

Your approval number is UTS HREC REF NO. ETH21-6375.

Approval will be for a period of five (5) years from the date of this correspondence subject to the submission of annual progress reports.

The following standard conditions apply to your approval:

- Your approval number must be included in all participant material and advertisements. Any advertisements on Staff Connect without an approval number will be removed.
- The Principal Investigator will immediately report anything that might warrant review of ethical approval of the project to the Ethics Secretariat.
- The Principal Investigator will notify the Committee of any event that requires a modification to the protocol or other project documents, and submit any required amendments prior to implementation. Instructions on how to submit an amendment application can be found here.
- The Principal Investigator will promptly report adverse events to the Ethics Secretariat. An adverse event is any event (anticipated or otherwise) that has a negative impact on participants, researchers or the reputation of the University. Adverse events can also include privacy breaches, loss of data and damage to property.
- The Principal Investigator will report to the UTS HREC or UTS MREC annually and notify the Committee when the project is completed at all sites. The Principal Investigator will notify the Committee of any plan to extend the duration of the project past the approval period listed above.
- The Principal Investigator will obtain any additional approvals or authorisations as required (e.g. from other ethics committees, collaborating institutions, supporting organisations).
- The Principal Investigator will notify the Committee of his or her inability to continue as Principal Investigator including the name of and contact information for a replacement.

This research must be undertaken in compliance with the Australian Code for the Responsible Conduct of Research and National Statement on Ethical Conduct in Human Research.

You should consider this your official letter of approval. If you require a hardcopy please contact the Ethics Secretariat.

If you have any queries about your ethics approval, or require any amendments to your research in the future, please don't hesitate to contact the Ethics Secretariat and quote the ethics application number (e.g. ETH20-xxxx) in all correspondence.

Yours sincerely,
The Research Ethics Secretariat

On behalf of the UTS Human Research Ethics Committees
C/- Research Office
University of Technology Sydney
E: Research.Ethics@uts.edu.au

Ref: E38

Appendix D: Peer Reviewed Publications

Part of Chapter 2:

Selamet, J. (2023). Local Standpoint and Human-Centred Design for Local Health: A Methodological Approach. *15th International Conference of the European Academy of Design*, 11, 166–177. https://doi.org/10.5151/ead2023-1BIL-01Full-13Selamet

Part of Chapter 4:

Selamet, J. (2024*).* Amplifying Local Dayak Voices for Designing Indigenous Health Systems in East Kalimantan. *Design for Health Conference*, June 25–27, 2024, Sheffield, UK.

Selamet, J. (2024*).* Amplifying Local Dayak Voices for Designing Indigenous Health Systems in East Kalimantan. *Design for Health. Taylor & Francis Group.* https://dx.doi.org/10.1080/24735132.2024.2436284

Part of Chapter 2 and 6:

Selamet, J. (2024). Towards local design intentions: A reflection on participatory design with Indigenous Dayak people in East Kalimantan. *Proceedings of the Participatory Design Conference 2024: Exploratory Papers and Workshops - Volume 2*, *2*, 87–92. https://doi.org/10.1145/3661455.3669875

Publications related to this research:

Selamet, J. (2024). Visual autoethnography of daily sounds. *Visual Communication Quarterly*. Taylor & Francis, Routledge, UK. https://doi.org/10.1080/15551393.2024.2373048

Selamet, J. (2024). A visual exploration of resource curse in East Kalimantan. *Visual Studies*. Taylor & Francis, Routledge, UK. https://doi.org/10.1080/1472586X.2024.2345157

Appendix E: The 15th International Conference of the European Academy of Design

What Got Us Here, Won't Get Us There

15th International Conference of the European Academy of Design
ONLINE and in **PERSON** in **Brazil**, **Finland**, **India**, **Spain** and the **UK**.
16-20 October 2023

Local Standpoint and Human-Centred Design for Local Health: A Methodological Approach

Juhri Selamet[a*]

[a]School of Design, Faculty of Design, Architecture and Building, University of Technology Sydney, NSW, Australia
*Corresponding author e-mail: juhri.selamet@uts.edu.au

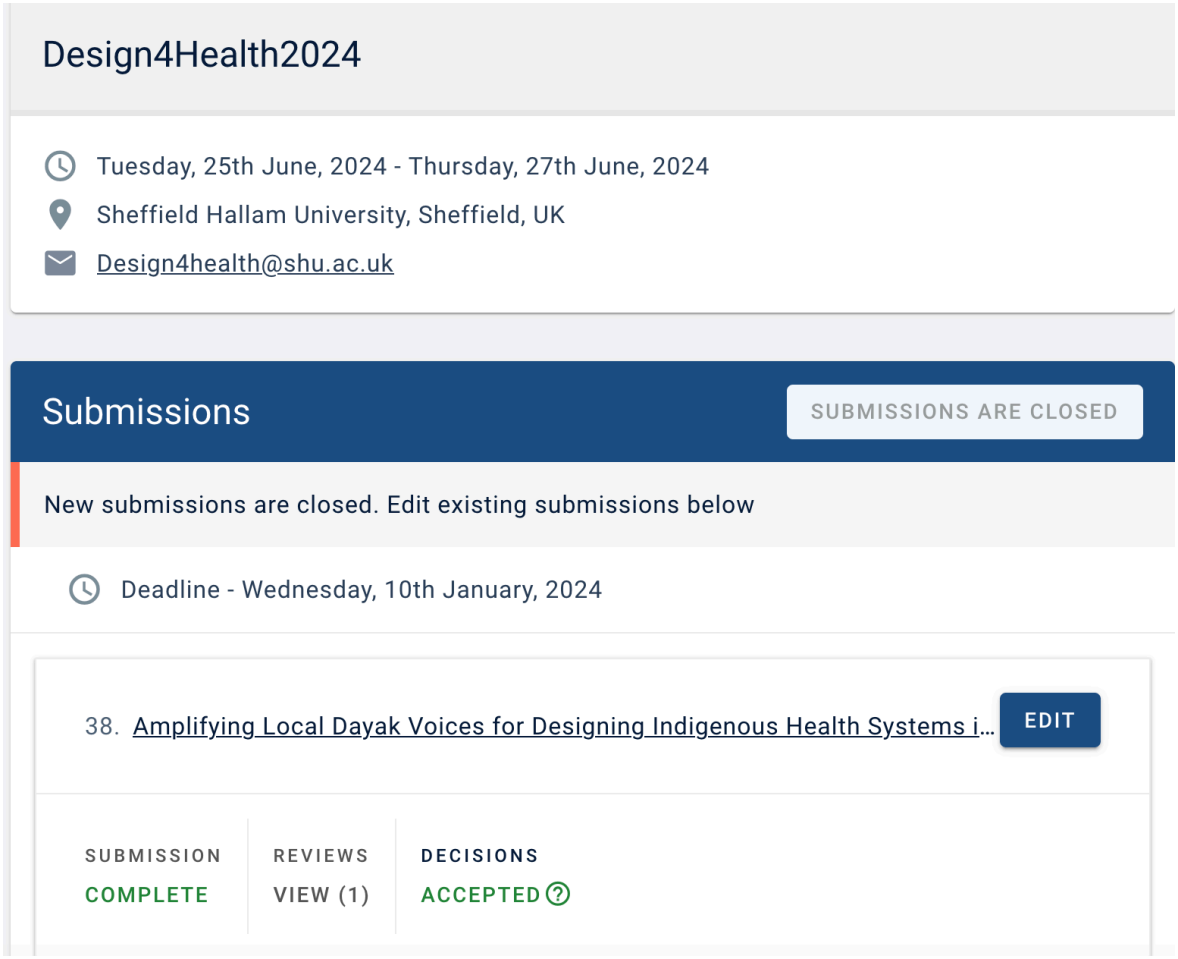
Abstract: This paper engages in design research within the Indigenous Dayak community in East Kalimantan, focusing on addressing local health discourse. It focuses on methodological questions to adopt more sensitive and ethical research methods when working with local people. In doing so, this paper encompasses three key aspects: (1) examining transdisciplinary approaches from an Indigenous standpoint and human-centred design, exploring their intersections; (2) contextualizing the research within the local Indonesian community; and (3) proposing a set of methods to examine Indigenous Dayak health within the chosen approaches and context. This paper suggests adapting ethnographic sensibility to blend local and design vocabularies, attempting to create a space for discourse for setting up the design research and practice within this inquiry.

Keywords: Dayak, East Kalimantan, Indigenous standpoint, Health, Human-centred design, design transdisciplinary

Part of Chapter 2:

Selamet, J. (2023). Local Standpoint and Human-Centred Design for Local Health: A Methodological Approach. *The 15th International Conference of the European Academy of Design.* https://dx.doi.org/10.5151/ead2023-1BIL-01Full-13Selamet

Appendix F: Design4Health 2024 Conference



Abstract:

This paper goes into the crucial role of local voices in shaping health systems, emphasizing the significance of amalgamating Indigenous standpoint and human-centred design perspective. The narrative unfolds through the lens of the Dayak community, employing the local term "pe' siu" to describe the act of sharing stories, particularly through interviews.

The paper begins by asserting the centrality of local voices in the design of health systems, recognising the direct impact these systems have on the communities they serve. Through the use of pe' siu interviews, the author engages with the experiences and knowledge of the local Dayak people in East Kalimantan, Indonesia, shedding light on their health practices, access to healthcare, and aspirations for the future. Additionally, the perspectives of local health workers serving remote areas are explored, providing a holistic understanding of the local health landscape.

A critical aspect highlighted in the paperr is the dominance of Western worldviews in research, leading to the marginalisation and oppression of Indigenous communities. The author underscores the need to move beyond traditional research approaches that silence local stories, emphasising the importance of cultural humility, critical self-reflection, and openness in the research process.

The incorporation of the Indigenous standpoint becomes a guiding principle, as the paper addresses specific research questions related to how Dayak communities engage in health practices, seek health information, and envision their future well-being. The author advocates for a human-centred

design perspective that not only recognizes but also amplifies local voices in the co-creation of health systems.

Interviews are framed as platforms for sharing perspectives, and the term pe' siu is contextualized as a means of preserving local values, knowledge, and perspectives. The narratives collected during these interviews serve as a rich source of insights and empathy, fostering a deeper understanding of the human experience and reinforcing the concept of human-centredness.

The paper's structure unfolds logically, beginning with an introduction contextualising the role of local health within the broader health landscape. The exploration of pe' siu provides a cultural backdrop for the subsequent interviews with local Dayak individuals. Through these narratives, the challenges faced by the community, particularly in the context of the closure of mining operations, are brought to light.

The environmental impact of coal and palm oil companies emerges as a significant concern for the Dayak people, affecting both their economy and health. The impending closure of mining operations raises questions about the community's future, with health-related challenges stemming from environmental factors like air and water pollution. The paper highlights the interconnectedness of environmental and health issues, emphasising the need for health system designs that address these complex dynamics.

A key takeaway from the interviews is the necessity of creating a platform that accommodates local voices within the health context. The author advocates for inclusive health system designs that empower local communities to actively participate in shaping their health futures. This involves listening to their perspectives, understanding their needs, and co-designing systems that align with their culture and lifestyle.

Looking towards the future, this paper explores the challenges and opportunities in Indigenous health. Collaborative initiatives between Indigenous communities, governments, and healthcare organisations are discussed, focusing on culturally sensitive and community-centred healthcare models. The integration of traditional healing practices with modern medical approaches is highlighted as a promising avenue for promoting holistic well-being.

Despite progress, this paper acknowledges ongoing challenges, including historical trauma, equitable access to healthcare resources, and the incorporation of Indigenous perspectives in policymaking. The narrative ends on a hopeful note, envisioning a future where Indigenous communities assert autonomy in healthcare decision-making, leading to sustainable, culturally grounded health systems. Education, community engagement, and the revitalisation of traditional knowledge are identified as crucial components in this journey towards a future where Indigenous health is not only improved but also driven by the values and priorities of the communities themselves.

Part of Chapter 4:

Selamet, J. (2024). Amplifying Local Dayak Voices for Designing Indigenous Health Systems in East Kalimantan. Abstract accepted at the *Design4Health Conference*, Sheffield Hallam University, Sheffield, UK, 25 – 27 June 2024.

Towards local design intentions: A reflection on participatory design with Indigenous Dayak people in East Kalimantan

Juhri Selamet
School of Design, Faculty of Design, Architecture and Building, University of Technology Sydney, NSW, Australia
juhri.selamet@uts.edu.au

ABSTRACT

Every design initiative begins with intention, and participatory design is no exception. Regrettably, prevailing discourse surrounding design intentions predominantly privileges the perspective of the researcher or designer, thus marginalising the design intentions articulated by local communities. Drawing from a participatory design research workshop focused on local health conducted within an Indigenous Dayak community in East Kalimantan, Indonesia, this paper critically examines the concept of *niat* (intention). It explores the participatory research process and the underlying intentions that guide it. Additionally, this paper presents argumentative reflections advocating for the recognition of local voices in participatory design as manifestations of localised design intentions. By prioritising the articulations of the community or participants, this approach facilitates a shift away from the exclusive consideration of intentions held by designers or researchers.

CCS CONCEPTS

• **General and reference** → Document types; Reference works; Document types; General conference proceedings; Cross-computing tools and techniques; Design; • **Social and professional topics** → User characteristics; Race and ethnicity; User characteristics; Cultural characteristics.

KEYWORDS

Dayak, Design Intention, East Kalimantan, Indigenous, Participatory Design

ACM Reference Format:
Juhri Selamet. 2024. Towards local design intentions: A reflection on participatory design with Indigenous Dayak people in East Kalimantan. In *Participatory Design Conference 2024 (PDC '24 Vol. 2), August 11–16, 2024, Sibu, Malaysia.* ACM, New York, NY, USA, 6 pages. https://doi.org/10.1145/3661455.3669875

1 INTRODUCTION

As a native of the interior region of East Kalimantan (East Borneo), I was raised within a knowledge framework that acknowledges the spiritual realm. For instance, the forest adjacent to our village is revered as a sacred environment, intertwined with mystical narratives and spiritual beliefs. Prior to venturing into the forest, elders typically impart the fundamental inquiry: 'What is your intention for entering the forest?' It is understood that the outcomes of such excursions hinge upon one's intentions. This concept is deeply rooted in the spiritual conviction that the forest has the ability to unveil an individual's true motives, which may lead to either positive or negative outcomes.

Upon returning to the interior of East Kalimantan, I embarked on field research within Indigenous Dayak communities. Dayak is one of the native Indigenous groups of Borneo [24]. During my initial meeting with the *kepala kampung* (village head). I was posed with inquiries familiar to me as a local resident, articulated in colloquial vernacular. The question about my research intentions reflects a common practice within local communities, serving as a basis to discern the potential ramifications of an activity on the community's well-being. 'Intention,' or 'niat' in the local lexicon, signifies a commitment to undertake a particular action. Within Indonesian culture, intentionality holds significant weight in socio-humanitarian discourse, particularly in spiritual contexts, as extensively deliberated upon by Islamic scholars concerning 'niyyat' (intention) and its interpretations.

This article provides a reflective analysis of the motivations behind my research endeavors in East Kalimantan on the island of Borneo, where communities have experienced rapid and significant changes in health, inequality, and the environment. These changes have particularly affected Indigenous Dayak population, placing them in a precarious health situation [15]. The deforestation and overall degradation of the natural environment have impacted the health of Dayaks living in and around the core of Borneo's forests [21, 28]. The article begins with an overview of intentionality, both generally and within the context of participatory design. It then explores my personal ethical considerations regarding intentionality before conducting fieldwork. Finally, it details my reflections on intentionality following a participatory workshop with local people, advocating for a greater focus on local design intentions over those of designers or researchers.

2 DESIGN INTENTION

Discussions surrounding intention in design have persisted within design studies for an extensive duration. Schön [26] introduced the concept of design as reflective practice, positing that design encompasses not only problem-solving but also learning from experience and adapting to evolving circumstances [33]. He underscores the significance of designers' intentions in shaping their actions and outcomes, emphasising the iterative and adaptive nature of the design process. Building upon Schön's groundwork, Richard Buchanan explores the rhetorical aspect of design intentions [6]. He contends that designers partake in a form of persuasive communication through their creations, aiming to convey specific messages

PDC '24 Vol. 2, August 11–16, 2024, Sibu, Malaysia

ACM ISBN 979-8-4007-0654-7/24/08
https://doi.org/10.1145/3661455.3669875

Site: https://dl.acm.org/doi/10.1145/3661455.3669875

Abstract:

Every design initiative begins with intention, and participatory design is no exception. Regrettably, prevailing discourse surrounding design intentions predominantly privileges the perspective of the researcher or designer, thus marginalising the design intentions articulated by local communities. Drawing from a participatory design research workshop focused on local health conducted within

an Indigenous Dayak community in East Kalimantan, Indonesia, this paper critically examines the concept of niat (intention). It explores the participatory research process and the underlying intentions that guide it. Additionally, this paper presents argumentative reflections advocating for the recognition of local voices in participatory design as manifestations of localized design intentions. By prioritising the articulations of the community or participants, this approach facilitates a shift away from the exclusive consideration of intentions held by designers or researchers.

Part of Chapter 6:

Selamet, J. (2024). Towards local design intentions: A reflection on participatory design with Indigenous Dayak people in East Kalimantan. *Proceedings of the Participatory Design Conference 2024: Exploratory Papers and Workshops - Volume 2*, *2*, 87–92. https://doi.org/10.1145/3661455.3669875

This paper received support from the *Vice-Chancellor's Postgraduate Research Student Conference Fund* to be presented at this conference.

Appendix H: Timeline for Completion

Juhri Selamet ( ), PhD Student in Design, School of Design, DAB, UTS

**UTS GRS Research Session (RS) 1 - January to June*
Research Session (RS) 2 - July to December

		2021	2022		2023		2024	
		3months	RS1	RS2	RS1	RS2	RS1	RS2
1 Stage I Planning and contextualising								
	1.1 UTS ethics training							
	1.2 UTS GRS online research approach & methods							
	1.3 Research topic and proposal							
	1.4 Contextualizing topic							
	1.5 Literature search and study							
	1.6 Methodological approach							
	1.7 Refining paper for Stage 1 assessment							
	1.8 **Stage 1 assesment**							
	1.9 Ethics draft application submission							
	1.10 Research ethics instrument							
	1.11 Data management - STASH submission							
2 Stage II Operazionalising								
	2.1 Ethics application approval							
	2.2 Launch recruitment instruments and maintan contact							
	2.3 International travel to the research field							
	2.4 Establish local networks and llive with local people							
	2.5 Data collection - Observation							
	2.6 Data collection - Interviews							
	2.7 Data collection - Design workshop							
	2.8 Data collection - texts							
	2.9 Preparing writing for UTS GRS Stage 2 assessment per requirement							
	2.10 **Stage 2 assessment**							
	2.11 Conference article							
3 Stage III Reporting and finalizing								
	3.1 Writing up dissertation							
	3.2 Editing and refining to tailor it to the genre related to this topic							
	3.3 Editing and refining to present a clear and cohesive thesis in the writing							
	3.4 **Stage 3 assessment***							
	3.5 Preparing for EWS							
	3.6 Revision							

Done
Plan

Note:

*My IRTP scholarship funding for my PhD study will be exhausted in September 2024. Therefore, I plan to undergo the Stage 3 Assessment in the 2014 RS-1 by June 2024. After that, I will have three months for my final submission, evaluation, and revision.

Table 5 Timeline for research completion

Appendix I: Data collection summary

Method	Description	Key selection criteria	Data/notes outcome	Time
Observation	I stayed in Long Lanuk village and participated in village activities such as meetings, social and cultural events, and health visits from the local government.	Mostly public place	Notes, photographs	January 2023 - July 2023
Interviews	Conversations with 9 Dayak people and 6 health workers were conducted. All interviews were audio recorded, with durations ranging from 30 minutes to 50 minutes per interview.	Key Dayak people (e.g. elders), key health workers (e.g. nurse)	Audio recording, transcribes, notes.	January 2023 - July 2023
Workshop	I conducted a 3-hour workshop with 8 local people at the sub-community health centre in Long Lanuk.	Key local individuals, some of whom participated in the interviews.	Audio recording, video with GoPro, photographs, notes	22 June 2023
Textual analysis	Artifacts or text review of existing public documents, reports, design, multimedia video, web and news.	Related to research topic.	Text data, images, videos	January 2023 - July 2023

Table 6 Data collection

Appendix J: Ethics information and forms

PARTICIPANT INFORMATION SHEET

ETH21-6375 - Envisioning the Future: Applying Indigenous Approaches and Human-Centred Design (HCD) to Design for the Promotion of Health in East Kalimantan

WHO IS CONDUCTING THIS RESEARCH?

My name is Juhri Selamet and I am a PhD student at UTS. My supervisors are Associate Professor, Dr. Alexandra Lara Crosby and Associate Professor, Dr. Jacqueline Gothe.

WHAT IS THE RESEARCH ABOUT?

This research aims to present a case study for the design of culturally sensitive, human centred health promotion campaigns. The design will be based on the standpoints and visions of local people in a community in East Kalimantan, Indonesia. The results of this research will be beneficial to designers and researchers working on health campaigns for local people in Kalimantan as well as other contexts. This study objectives are to (1) explore the intersections between local approaches to health and human-centred approaches to communication into a culturally sensitive information design framework, (2) contribute to better health outcomes by informing community leaders, design practitioners, design researchers in academic institutions, organizations, and the health sector about culturally sensitive visual communication design within and between local communities

WHY HAVE I BEEN INVITED?

You have been invited to participate because the information you provide will be used to help understand how to create the design of culturally sensitive, human centred health promotion campaigns.

Before you decide to participate in this research study, I need to ensure that it is ok for you to take part. This interview is for local Dayak people who live in Benabaru village, East Kalimantan, Indonesia and non-local Dayak people who have experience working with Dayak people in Benabaru related to Dayak's health, and are 18 years or over.

WHAT DOES MY PARTICIPATION INVOLVE?

Participation in this study is voluntary. It is completely up to you whether or not you decide to take part.
If you decide to participate, I will invite you to participate in an interview. You will be asked about local traditional knowledge related to health practice in your village, your access to health information, and about your view, experience and perspective toward health promotion in your village.

The interview will take approximately 50 minutes, it will be semi-structured (this means I have a few questions, but also allows for us to discuss a range of points). The interview will be audio taped, transcribed and returned to you to make any corrections.

ARE THERE ANY RISKS/INCONVENIENCE?

Risk to participants is low, but there may be possible risks. This includes the slight likelihood of inconvenience. I assure you I am mindful about being sensitive to and aware of your busy schedule and will do my best not to be a distraction or a source of inconvenience you. You may also feel uncomfortable about being recorded in interviews in which case I can pause or turn-off the recording. Additionally, you are not obliged to answer any questions that you don't feel comfortable to do so.

If you have any concerns or discomfort, you are more than welcome to withdraw from the research at any time, and know all participant information, activity and conversations will be kept strictly confidential and not used without your consent.

If you feel distress during your participation in this study and your distress persists, please consider to contact Local Health Clinic Helpline: +62 857-5217-1295 (PUSKESMAS SAMBALIUNG), Emergency Call: 0813 4485 8696 (Local Hospital), website: https://rsuddrabdulrivai.co.id/index.html# , or Indonesian mental health helpline: 500-454.

DO I HAVE TO TAKE PART IN THIS RESEARCH PROJECT?

Participation in this study is voluntary. It is completely up to you whether or not you decide to take part.

WHAT IF I WITHDRAW FROM THIS RESEARCH PROJECT?

You are under no obligation to participate in this research. If you decide not to participate, it will not affect your relationship with the researchers or the University of Technology Sydney. If you wish to withdraw from the study once it has started, you can do so at any time without having to give a reason, by contacting the researcher in person Juhri Selamet or by email at juhri.selamet@student.uts.edu.au or on his mobile +62 . If you withdraw from the study, any recordings and transcripts will be destroyed. However, it may not be possible to withdraw your data from the study results as any details identifying will be already removed.

WHAT WILL HAPPEN TO INFORMATION ABOUT ME?

By signing the consent form you consent to the researcher collecting and using personal information about you for the research project. All this information, the collected data and names will be treated confidentially by using pseudonyms for each participant and keeping your identity anonymous. The management of collected data will be in compliance with the Research Data Management Vice-Chancellor's Directive (UTS, 2014). Data records will be stored in the following format: handwritten notes, voice recording, transcripts of audio recording and photocopies of documents or photos of artefacts or objects. Current data will be saved on an external hard drive locked with a password. A backup copy will be saved in university cloud storage system and in accordance with requirement of university unit responsible for records (UTS, 2017). Data in storage will not contain participants' personal details. Hard copies of data will be stored in UTS researcher lockers. Only my academic supervisors and I will have access to the data. Your information will be used for the purpose of this research project and it will only be disclosed with your permission, except as required by law. In any publication, information will be provided in such a way that you cannot be identified.

It is anticipated that the results of this research project will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be provided in such a way that you cannot be identified, except with your permission. Additionally, research findings will be reported as themes that are common to many of the participants, and they will be reported in such a way that no participating individual or organization can be identified.

In accordance with relevant Australian and/or NSW Privacy laws, you have the right to request access to the information about you that is collected and stored by the research team. You also have the right to request that any information with which you disagree be corrected. Please inform the research team member named at the end of this document if you would like to access your information.

The results of this research may also be shared through open access (public) scientific databases, including internet databases. This will enable other researchers to use the data to investigate other important research questions. Results shared in this way will always be de-identified by removing all personal information (e.g. name, address, date of birth etc.).

WHAT IF I HAVE ANY QUERIES OR CONCERNS?

If you have queries or concerns about the research that you think I or my supervisors can help you with, please feel free to contact me on my email at juhri.selamet@student.uts.edu.au or mobile phone +61 (Australia); +62 (Indonesia). You can also speak to a local independent contact, Cahya Daulay, phone number +62 21 5422 0808 or contact him by email at cahya.daulay@umn.ac.id.

You will be given a copy of this form to keep.

NOTE:
This study has been approved in line with the University of Technology Sydney Human Research Ethics Committee [UTS HREC] guidelines. If you have any concerns or complaints about any aspect of the conduct of this research that you wish to raise independently of the research team, please contact the Ethics Secretariat on ph.: +61 2 9514 2478 or email: Research.Ethics@uts.edu.au], and quote the UTS HREC reference number. Any matter raised will be treated confidentially, investigated and you will be informed of the outcome.

CONSENT FORM

ETH21-6375 - Envisioning the Future: Applying Indigenous Approaches and Human-Centred Design (HCD) to Design for the Promotion of Health in East Kalimantan

I _____ agree to participate in the research project being conducted by Juhri Selamet, email: juhri.selamet@student.uts.edu.au, phone: +61 [redacted] (Australia) / +62 [redacted] (Indonesia).

I have read the Participant Information Sheet or someone has read it to me in language that I understand.

I understand the purposes, procedures and risks of the research as described in the Participant Information Sheet.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time without affecting my relationship with the researchers or the University of Technology Sydney.

I understand that I will be given a signed copy of this document to keep.

I am aware that I can contact Juhri Selamet as researcher for this study and Cahya Daulay as his independent local contact if I have any concerns about the research.

_____ ____/____/____
Name and Signature [participant] Date

_____ ____/____/____
Name and Signature [researcher or delegate] Date

Appendix K: List of research instrument docs approved by ethics committee.

Documents attached to this application:

How to attach documents

1. Click on 'Add'
   Ensure the fields are as follows:
   - Document type- soft copy
   - Name: Include the document name and version number
   - Description: This field is optional
2. You can then either select the file you want to upload OR drag and drop it where it says 'Drop file here'
3. Click on 'OK'

Note: Please use the following HREC templates when creating an information sheet, consent form, verbal script, etc.: HREC templates. All submitted documents should be titled, and have have version control included in the footer.*

1	Document type	Soft copy
	Name	Research data management plan (RDMP) Juhri Selamet
	Reference (Document Title)	rdmp Juhri Selamet updated 10.24.22.pdf
	Description	RDMP updated 10.24.2022
2	Document type	Soft copy
	Name	[English] HREC-Template Participant information sheet-consent form-Juhri SELAMET_Interview
	Reference (Document Title)	[English] HREC-Template Participant information sheet-consent form-Juhri SELAMET_Interview updated 11.27.22.docx
	Description	The document was updated on 11.27.22 (minor update on ARE THERE ANY RISKS/INCONVENIENCE? Section). Updates have been made using tracked changes.
3	Document type	Soft copy
	Name	[English] HREC-template-invitation-letter-Juhri SELAMET Interview
	Reference (Document Title)	[English] HREC-template-invitation-letter-Juhri SELAMET Interview.docx
	Description	[English] HREC-template-invitation-letter-Juhri SELAMET Interview
4	Document type	Soft copy
	Name	[English] HREC-Template Participant information sheet-consent form - Juhri SELAMET workshop
	Reference (Document Title)	[English] HREC-Template Participant information sheet-consent form - Juhri SELAMET workshop updated 11.27.22.docx
	Description	The document was updated on 11.27.22 (minor update on ARE THERE ANY RISKS/INCONVENIENCE? Section). Updates have been made using tracked changes.
5	Document type	Soft copy
	Name	[English] HREC-template-invitation-letter-Juhri SELAMET workshop
	Reference (Document Title)	[English] HREC-template-invitation-letter-Juhri SELAMET workshop.docx
	Description	[English] HREC-template-invitation-letter-Juhri SELAMET workshop
6	Document type	Soft copy
	Name	[English] Questions list for interview and workshop
	Reference (Document Title)	[English] Questions list for interview and workshop.docx
	Description	[English] Questions list for interview and workshop
7	Document type	Soft copy
	Name	References List Juhri Selamet
	Reference (Document Title)	References List Juhri Selamet updated 10.24.2022.docx
	Description	References List for the ethics application, updated 10.24.2022
8	Document type	Soft copy
	Name	Terms list Juhri Selamet
	Reference (Document Title)	Terms Juhri Selamet.docx
	Description	Terms list for the ethics application
9	Document type	Soft copy
	Name	[English] HREC-photo-consent-form-Juhri SELAMET
	Reference (Document Title)	[English] HREC-photo-consent-form-Juhri SELAMET.docx
	Description	[English] HREC-photo-consent-form-Juhri SELAMET
10	Document type	Soft copy
	Name	[Indonesian] HREC-photo-consent-form-Juhri SELAMET
	Reference (Document Title)	[Indonesian] HREC-photo-consent-form-Juhri SELAMET.docx
	Description	[Indonesian] HREC-photo-consent-form-Juhri SELAMET

11	Document type	Soft copy
	Name	[Indonesian] Questions list for interview and workshop
	Reference (Document Title)	[Indonesian] Questions list for interview and workshop.docx
	Description	[Indonesian] Questions list for interview and workshop
12	Document type	Soft copy
	Name	[Indonesian] HREC-Template Participant information sheet-consent form-Juhri SELAMET_Interview
	Reference (Document Title)	[Indonesian] HREC-Template Participant information sheet-consent form-Juhri SELAMET_Interview updated 11.27.22.docx
	Description	The document was updated on 11.27.22 (minor update on ARE THERE ANY RISKS/INCONVENIENCE? Section) following the English ver version update. Updates have been made using tracked changes.
13	Document type	Soft copy
	Name	[Indonesian] HREC-template-invitation-letter-Juhri SELAMET Interview
	Reference (Document Title)	[Indonesian] HREC-template-invitation-letter-Juhri SELAMET Interview.docx
	Description	[Indonesian] HREC-template-invitation-letter-Juhri SELAMET Interview
14	Document type	Soft copy
	Name	[Indonesian] HREC-Template Participant information sheet-consent form-Juhri SELAMET_Workshop
	Reference (Document Title)	[Indonesian] HREC-Template Participant information sheet-consent form - Juhri SELAMET workshop updated 11.27.22.docx
	Description	The document was updated on 11.27.22 (minor update on ARE THERE ANY RISKS/INCONVENIENCE? Section) following the English ver version update. Updates have been made using tracked changes.
15	Document type	Soft copy
	Name	[Indonesian] HREC-template-invitation-letter-Juhri SELAMET workshop
	Reference (Document Title)	[Indonesian] HREC-template-invitation-letter-Juhri SELAMET Interview.docx
	Description	[Indonesian] HREC-template-invitation-letter-Juhri SELAMET workshop
16	Document type	Soft copy
	Name	[English] Call for participants letter -Juhri SELAMET Interview
	Reference (Document Title)	[English] Call for participants letter -Juhri SELAMET Interview.docx
	Description	
17	Document type	Soft copy
	Name	[English] Call for participants letter-Juhri SELAMET workshop
	Reference (Document Title)	[English] Call for participants letter-Juhri SELAMET workshop.docx
	Description	
18	Document type	Soft copy
	Name	[Indonesian] Call for participants letter -Juhri SELAMET Interview
	Reference (Document Title)	[Indonesian] Call for participants letter -Juhri SELAMET Interview.docx
	Description	[Indonesian] Call for participants letter -Juhri SELAMET Interview
19	Document type	Soft copy
	Name	[Indonesian] Call for participants letter-Juhri SELAMET workshop
	Reference (Document Title)	[Indonesian] Call for participants letter-Juhri SELAMET workshop.docx
	Description	
20	Document type	Soft copy
	Name	ETH21-6375 Ethics query responses-ac-js 10.24.2022
	Reference (Document Title)	ETH21-6375 Ethics query responses-ac-js 10.24.2022.docx
	Description	Via email, ver 10.24.2022
21	Document type	Soft copy
	Name	ETH21-6375 - CROSBY (for SELAMET) - HREC outcome and comments
	Reference (Document Title)	ETH21-6375 - CROSBY (for SELAMET) - HREC outcome and comments-js responses.28.11.22.docx
	Description	This document contains responses to ETH21-6375 - CROSBY (for SELAMET) - HREC outcome and comments sent on November 25, 2022.
22	Document type	Soft copy
	Name	Protocol and Guideline on the Management of Risk - Distress
	Reference (Document Title)	Protocol and Guideline on the Management of Risk Distress Juhri Selamet.docx
	Description	

23	Document type	Soft copy
	Name	[English] HREC-verbal-consent-script-template-Interview
	Reference (Document Title)	[English] HREC-verbal-consent-script-template-Juhri SELAMET Interview 11.27.22.docx
	Description	
24	Document type	Soft copy
	Name	[English] HREC-verbal-consent-script-template-workshop
	Reference (Document Title)	[English] HREC-verbal-consent-script-template-Juhri SELAMET workshop 11.27.22.docx
	Description	
25	Document type	Soft copy
	Name	[Indonesian] HREC-verbal-consent-script-template-Interview
	Reference (Document Title)	[Indonesian] HREC-verbal-consent-script-template-Juhri SELAMET Interview.docx
	Description	In Bahasa (Indonesian)
26	Document type	Soft copy
	Name	[Indonesian] HREC-verbal-consent-script-template-Workshop
	Reference (Document Title)	[Indonesian] HREC-verbal-consent-script-template-Juhri SELAMET Workshop.docx
	Description	In Bahasa (Indonesian)

Reminder to student applicants:

1. Please note that once your application is submitted it will go directly to your supervisor and not to the Committee.
2. We **strongly** recommend notifying your supervisor that you have submitted your application in case of any technical issues, to avoid potential delays in the review process.
3. Once your supervisor endorses your application it will go to your Local Research Office for endorsement before coming to the Ethics Secretariat for review.
4. Your electronic application must be endorsed by your supervisor by the Local Research Office (LRO) submission deadline.
5. Please also ensure that the Primary AOU listed at the end of the Investigators page is updated to your supervisor's AOU. This will show in the table under 'Internal personnel listed below', once you add them. If you need any assistance with this please contact Research.Ethics@uts.edu.au or call 9514 9772. Please note that this is particularly important if you have a dual role as a staff/student as your application could go to the wrong faculty for review through the automated process.

Declaration

Declaration

I have answered all questions in the risk assessment truly and completely to the best of my knowledge

I will notify the UTS Human Research Ethics Committee of any variation to this research that may alter the level of risk associated with it

This research will be undertaken in compliance with the UTS Research Ethics and Integrity Policy or any replacement or amendment thereof

This research will be undertaken in compliance with the Australian Code for the Responsible Conduct of Research and National Statement on Ethical Conduct in Human Research

Please click on the "Submit" button in the Actions menu.

Confirmation

Confirmation by Local Research Office High Risk

Application type*

Research (student project)

Internal personnel listed on this ethics protocol*