

Learning from traditional products and practices in India for design for sustainability

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Abstract

This thesis explores the intersection of traditional Indian products and practices with contemporary sustainable design, aiming to identify what modern sustainability approaches can learn from these rich cultural traditions. Despite the increasing importance of sustainability in design, current frameworks often fall short in addressing the full spectrum of ecological, social, cultural, and personal dimensions. The literature review highlights that while there are numerous sustainability approaches available, they tend to emphasize technical and economic aspects, often neglecting deeper human values, cultural relevance, and spiritual values. This gap suggests a critical need for more holistic and inclusive sustainability models.

The research question guiding this study is: "What can Design for Sustainability learn from traditional Indian products and practices?" This question seeks to uncover the sustainability principles embedded in traditional Indian crafts and everyday practices, and to understand how these principles can inform and enhance contemporary design strategies. By examining traditional methods that naturally incorporate sustainable resource management, resilience, and harmony with nature, this study aims to bridge the gap between traditional wisdom and modern design practices.

Through a series of case studies and examples from various Indian contexts, a set of interviews with Indian design practitioners and practical design experimentation, the research investigates how traditional knowledge can be integrated into modern design processes to create more context-specific and culturally meaningful sustainable solutions. The main contributions of this thesis are:

- A Holistic framework for designing meaningful sustainable contemporary products
- Example of a contemporary products incorporating traditional insights
- Adapted Quadruple Bottom Line (QBL)

Ultimately, this thesis advocates for a more comprehensive approach to sustainable design that values and incorporates diverse cultural perspectives and traditional wisdom. By doing so, it contributes to the development of design practices that are not only ecologically sound but also socially equitable, culturally resonant, and personally meaningful. This holistic perspective is essential for achieving long-term sustainability that enhances human well-being and respects the planet's ecological limits.

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Declaration

This thesis has not been submitted in support of an application for another degree at this or any other university. It is the result of my own work and includes nothing that is the outcome of work done in collaboration except where specifically indicated. Many of the ideas in this thesis were the product of discussion with my supervisors, Professor Stuart Walker, and Dr Lisa Thomas, Dr Naomi Jacobs and Dr Louise Mullagh.

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Sejal Changede
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Preface

I have always been fascinated by culture, and my rich heritage provides me with a strong sense of identity, values, and security about who I am. An ideal day for me would involve experiencing culture in some form. I am particularly captivated by the diversity of traditional knowledge and skills showcased at festivals, fairs, religious ceremonies, and social events such as marriages. These occasions offer glimpses of India's rich heritage, giving me the opportunity to rediscover traditions and practices that have become somewhat obscure due to my semi-urban upbringing with an influence of modernist outlook.

During my undergraduate course in lifestyle accessories design at the National Institute of Fashion Technology, one module required collaboration between design students and regional craft artisans. We visited three craft clusters around Bengaluru and were asked to choose one or two clusters to work with. It was during this module that I developed a deep interest in traditional crafts and understood their relevance to contemporary living.

After graduating, I worked as a jewellery designer, driven by my love for handcrafting. Subsequently, I joined a craft-based firm as a product designer, where we collaborated with various traditional artisans to design a range of products, from furniture and wall murals to lifestyle products and high-end decorative pieces. This experience allowed me to travel and explore numerous traditional Indian handicrafts and art forms. It was during this time that I witnessed the challenges faced by artisan communities and their struggles. Simultaneously, I recognized the potential and value of these traditional craft and art forms for the future. This realization prompted me to study design management at the master's level with the aim of bringing about positive change through my passion for design.

During my master's dissertation, fuelled by my love for crafts and handcrafting, my supervisors and course director suggested that I pursue my master's dissertation as a doctoral study. Understanding the long-term positive impact of research, I decided to move forward with this idea and started developing a proposal. I had numerous ideas to explore related to traditional handicrafts, such as the contribution of craft enterprises to the economy, sustainability and livelihood issues in the Indian craft sector, design for policy and its implications for the craft sector, and the contribution of crafts to sustainable development.

While researching these topics, I began exploring how some of the everyday practices rooted in my experiences of growing up in rural India were inherently eco-friendly – and this topic became the basis for my PhD.

For instance, having spent most of my life in Maharashtra, one of my favourite festivals is *Ganesh Chaturthi*, a Hindu festival celebrating the birth of Lord *Ganesh*, the elephant-headed god of wisdom and prosperity. The 10-day festival involves the installation of *Ganesh's* clay idols in homes and on elaborate pandals. These idols are handmade using local clay that naturally dissolves in water. The making of *Ganesh* idols is often a traditional craft passed down through generations. Homes and public places are adorned with flowers, garlands, *rangoli*, and handmade floral *torans*, creating a vibrant atmosphere. Communities construct elaborately decorated marquees, often delivering social and moral messages using handmade idols and figurines. Families and communities gather at the marquees for celebrations featuring folk dance, music, and drumming. The festival includes competitions for all age groups to showcase their skills and talents. Traditional recipes are prepared using authentic seasonal produce as offerings to the gods, which are then shared among friends and family. Local sweet sellers and street vendors also offer special food during the festival, and for rituals, religious products like handmade incense sticks, clay lamps, and cotton wicks are used. Though some practices have changed over time, there is a growing awareness of the importance of traditional methods.

Ganesh Chaturthi is not only a cultural and religious celebration but also a significant contributor to fostering a sense of community. It reinforces the spiritual and cultural significance of the festival, nurturing creativity and supporting local traditional artisans and cottage industries, regardless of class, caste, and religious beliefs. Therefore, my personal experiences of growing up in India, previous studies and research experience inspired me to further explore the possibility of learning from these practices for meaningful and holistic sustainable future. With this idea I was encouraged to apply for the PhD opportunity under sustainability theme of Beyond Imagination Research Project, funded by the Expanding Excellence in England (E3).

Chapter 1 Introduction

1 Introduction

This chapter introduces the context, background and significance of the research topic as well as explaining the value of the study. It also provides an overview of the thesis structure and explains the reasons for the researcher's interest in the topic prioritised in this research journey.

1.1 Context of study

The Industrial Revolution brought many benefits that allowed people to start living more comfortable lives than had previously been possible. In the late stages of modernity however, many people in advanced industrial societies started to pursue lifestyles that were not only comfortable, but luxurious. This trend, characterised by high levels of consumption, has continued to the present day, and shows no signs of abating despite being unsustainable.

The consequences of unsustainable lifestyles and manufacturing and consumption habits have begun to be witnessed through climate change, catastrophic biodiversity losses and growing global inequities. Developing more sustainable ways of living has therefore increasingly become a central concept in reshaping and maintaining our world for ensuring the continuity of today and future lives. Whilst the concept of sustainability is contested, many definitions tend to define sustainability as the ability to maintain, support, sustain, endure, or keep a balance. However, the idea of sustainability is complex and continuously growing, and a universally accepted understanding and definition of sustainability is yet to be arrived at (Reubens, 2010). In recent years we have attended to address these issues through various approaches such as 'triple bottom line,' 'cradle-to-cradle,' 'circular economy,' 'ecomodernism,' etc. but still they are matters of great concern and there is an urgency to work towards it. While earlier it was thought that modern science and technology will provide the solution, it is apparent that traditional products and practices also have critical insights to offer as many are inherently sustainable and resilient.

My MA dissertation research demonstrated that traditional knowledge and artefacts that have been inherited through generations often demonstrate an excellent quality in use and design, reflecting a harmony between aesthetics and function, spiritual and practical needs, economic and ecological judgments, resulting from millennia of shared wisdom and experiences. The traditional practice often has the comparative advantage for holistic and sustainable improvement of people's lives that fits well with localized eco-systems.

The richness of Indian heritage exemplifies the depth of traditional knowledge and skills still in practice across India. These traditions offer a glimpse into the values underlying Indian society. One of the most visible forms of traditional knowledge and skills can be seen in crafts. They are present in the exquisite sarees worn by women and the beautifully handcrafted jewellery displayed during festive occasions. Musical instruments played during rituals enhance the sanctity of the occasion. Traditional earthenware, handmade by Indian potters, amplifies the culinary prowess of the community.

However, each of these encounters leads me to pose a host of questions. For instance, what sustainable materials and sourcing practices are evident in these indigenous art and craft objects, and how can these inform sustainable material choices in contemporary design? I also dwell on the many questions surrounding the traditions that inform and feed their learning process. There are also questions about the significance of these forms of traditional knowledge and skills in our lives and whether they have potential to help us transition towards more holistic and meaningful future. What can the cultural and spiritual significance, symbolic values, community-based approaches, teach us about a balance between different worldviews and a critical consideration of traditional practices and products for sustainable future, without completely reverting to the past? What role can design, and designers play in this and how?

While traditional knowledge and practices have been widely explored, intensively studied, and implemented in various fields for development purposes (UNESCO, 2018), this is not yet a hot topic in the design professions. Having said this though, this issue is not entirely new to design, as Viktor Papanek (1985) recognised that traditional knowledge is a valuable asset for designers in his proposals for revitalising 'vernacular design' to improve the quality of lives (Papanek, 1985a).

After Papanek, design scholars such as Stuart Walker (Walker, 2011; Walker, 2013, 2017, 2021) and Ezio Manzini (Manzini, 2010, 2019) have proposed similar critical issues from various points of view. What all have in common is to argue that the role of design has been addressed too much to increasing competitiveness for industries or stimulating more consumerism; design indeed has more responsibility also to meet global social and environmental problems, so that it addresses holistic sustainable development. However, this vision has never become mainstream. As Victor Margolin (2002) mentions, the proposals from Papanek and other scholars remained marginal and did not bring significant impact on the design profession.

Margolin's observation that Papanek's and similar ideas have remained marginal in Western commercial design and education highlights the systemic prioritization of market-driven

innovation over holistic, ethical, and sustainable design approaches. This marginalization persists because design in the industrialized West has often been oriented toward profit-making and consumerism, side-lining alternative paradigms that challenge these dominant frameworks (Margolin, 2002). However, the contemporary design landscape is increasingly influenced by emergent fields such as Pluriversal Design, Decolonial Design, More-than-Human approaches, and Bio-Design, which push the boundaries of conventional design thinking. These design approaches embrace diverse worldviews, including indigenous knowledge systems and community-based practices, offering a broader and more inclusive lens to tackle global social and environmental challenges. By emphasizing relationality, ecological interconnectedness, and cultural plurality, they resonate with and expand upon Papanek's original critique. Engaging with these approaches may provide an opportunity to reframe traditional practices not as relics of the past but as vital resources for envisioning sustainable futures. This research aligns with these movements, exploring how traditional Indian knowledge systems can inform contemporary design discourse, while contributing to a growing dialogue that seeks to reposition the role of design as a transformative and inclusive practice.

Based on this concern, this study aims to learn from traditional practices and products in India to inform Design for Sustainability. The Indian traditional conception of life is embodied in a coherent worldview in which all its aspects exist in a state of inter-related harmony, being governed by a universal order that is reflected in all realms of human experience. According to Hinduism, the human being is part of a well-ordered system in which all aspects of life and nature have their place, and are not in opposition, but in harmony with each other. This harmony between humans and nature is integral to the Indian tradition and ethos (WWF-India, 2015).

In rural India, the fulfilment of basic needs depends primarily on organic farming, manual skills, and artisanal craftsmanship rather than energy-intensive systems. Many daily essentials are crafted by hand, using locally available, natural materials. This approach limits reliance on electricity and other modern power sources. A prominent example is the preference for handlooms over power-looms, while Khadi, a traditional homespun fabric, enjoys widespread popularity among Indians, cutting across generational, gender, and class divides (Ramawamy, 2009).

1.2 Research question, aims and objectives

The main aim of the research is to investigate everyday traditional products and practices in rural India and the values embedded in them within the context of sustainability, to understand what product design can learn from them for holistic sustainable futures.

Therefore, the research question is **“What can Design for Sustainability learn from traditional Indian products and practices?”**.

To address the overall research question, the objectives of this research are:

1. To develop a critical understanding of modern approaches to Design for Sustainability
2. To consider the relationship between traditional knowledge, sustainability and design, with a focus on the Indian context.
3. To identify and document traditional Indian products and practices that are still relevant to contemporary lifestyles through autoethnographic case studies.
4. To conduct a detailed analysis of selected traditional Indian products and practices to evaluate their alignment with sustainability principles, including evaluations of materials, production processes, and lifecycle considerations, and to highlight sustainability aspects through comparative studies with modern equivalents.
5. To conduct interviews with contemporary design professionals in India to understand their motivations and inclinations towards traditional crafts and sustainable design.
6. To develop a comprehensive framework for designing holistic and meaningful products, based on insights from objectives 3, 4 and 5.
7. To design a contemporary everyday product incorporating insights from traditional Indian products and practices – and evaluate to determine its compliance with sustainability principles.

This research aims to bridge traditional wisdom with modern design, fostering a sustainable future by integrating the learnings from time-tested practices into contemporary design.

1.3 Structure of the thesis

The thesis comprises eight chapters. The research is structured around several key objectives, each building upon the insights and findings from the preceding chapters.

Chapter 1: Introduction

The introduction outlines the research objectives and sets the stage for exploring the potential of traditional Indian products and practices in informing contemporary sustainable design. It introduces the key concepts and provides a rationale for the study.

Chapter 2: Literature Review

This chapter reviews existing literature on sustainability, design for sustainability, and traditional knowledge. It examines various theoretical frameworks, including Stuart Walker's QBL (Quadruple Bottom Line), and discusses their relevance to holistic product design. It also reviews sustainability in Indian traditional ways of living and provide some examples. The review highlights gaps in current sustainability practices and the need for integrating cultural and traditional insights.

Chapter 3: Research Methodology

The methodology chapter details the research design, including the use of case studies and autoethnography. It explains the data collection methods, such as interviews and field observations, and outlines the analytical approaches used to interpret the findings.

Chapter 4: Traditional Indian Products and Associated Practices

This chapter presents components of larger case study approach by exploring everyday life in rural India and explores six everyday objects as detailed case studies of traditional Indian products and associated practices. It examines their cultural significance, production techniques, and sustainability attributes. The case studies provide concrete examples of how traditional practices embody holistic principles of sustainability and community engagement.

Chapter 5: Indian Designers Working with Crafts: Key Insights

Interviews with six designers working in handicraft industry in India form the basis of this chapter. The insights gained from these interviews are analysed to understand the challenges and opportunities in integrating traditional knowledge into contemporary design practices. The chapter highlights the importance of cultural transmission, community involvement, and cultural values meanings associated with traditional crafts.

Chapter 6: Discussion of Findings

Building on the previous chapters, this chapter synthesizes the findings to develop a comprehensive framework for holistic and meaningful product design. It identifies key themes such as knowledge transmission, local production ecosystems, cultural meaning, transparency,

and resource consciousness. The adapted QBL framework is introduced, emphasizing the inclusion of personal meaning alongside economic, social, and practical dimensions.

Chapter 7: The Willow Bed

This chapter describes the design and creation of a contemporary product—a willow bed—incorporating insights from Chapter 6 and taking inspiration from traditional Indian *charpai* techniques and local British crafts. It discusses the practical application of traditional knowledge, the development of related rituals and traditions, and the broader implications for holistic sustainable product design. The chapter advocates for a shift in consumer attitudes towards meaningful and sufficiency-oriented living practices.

Chapter 8: Conclusion

The conclusion summarizes the research findings and their implications for holistic sustainable product design. It presents contributions of this research and the chapter also discusses the potential for future research to further explore and integrate traditional knowledge from diverse global contexts. It reiterates the need for a paradigm shift in design practices, moving away from consumerist and technocratic models towards life-centred approaches that prioritize holistic well-being.

RQ: What can Design for Sustainability learn from traditional Indian products and practices?

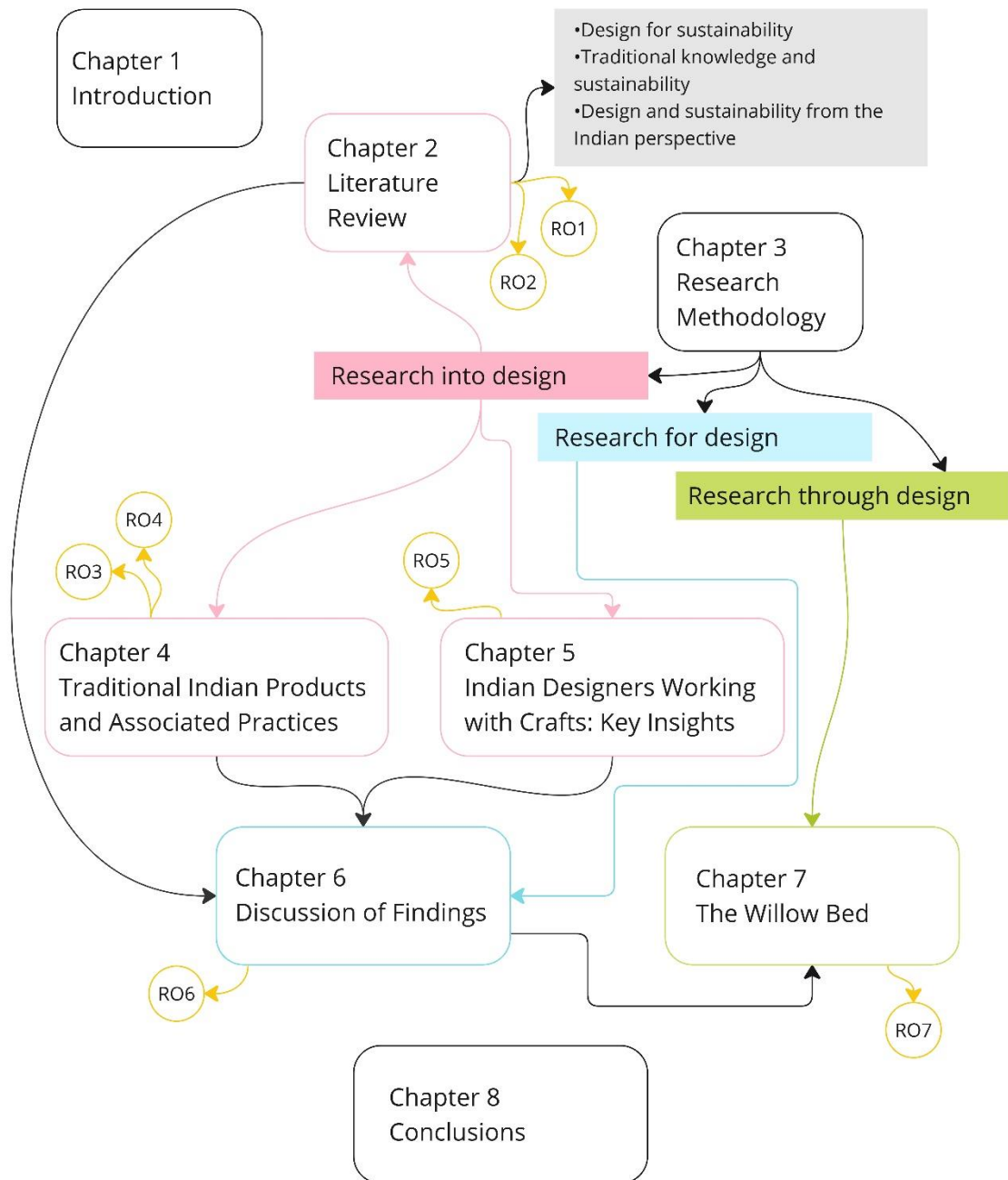


Figure 1 Structure of the thesis

Chapter 2 Literature Review

2 Literature Review

This chapter presents a literature review on the themes of sustainability; design for sustainability; tradition; traditional knowledge, design and sustainability from the Indian perspective. This chapter addresses the two research objectives:

1. To develop a critical understanding of modern approaches to Design for Sustainability
2. To consider the relationship between traditional knowledge, sustainability and design, with a focus on the Indian context.

The chapter begins with the introduction (section 2.1) and explores historical and contemporary concerns about sustainability, emphasizing the impact of human activities on Earth's ecosystems and the profound changes brought by the Industrial Revolution. Section 2.1.1 traces the evolution of sustainability, from its early development to mainstream recognition, discussing key definitions, milestones, and critiques of various interpretations. Section 2.1.2 explores the evolution of Design for Sustainability, addressing its theoretical foundations and role in tackling environmental, social, and economic challenges. It covers the transition from craftsmanship to industrialization, the Arts and Crafts Movement's impact, post-WWII consumer-led design, and the rise of green design in the 1980s. Additionally, it examines the broadening scope of sustainable design post-1990, highlighting alternative practices that address global issues like climate change and social responsibility.

Section 2.1.3 introduces key frameworks and systems for sustainable design. It covers approaches like Natural Capitalism for resource efficiency, Cradle-to-Cradle for closed-loop material cycles, Biomimicry for nature-inspired solutions, Ecodesign for environmental criteria integration, Emotionally Durable Design for longer product lifespans, Design for Sustainability addressing social, ecological, and economic aspects, Design for Sustainable Behaviour influencing user actions, Design for Social Innovation combining tech and social innovations, Circular Economy for resource efficiency, Product-Service System Innovation linking product use with services, Life-Cycle Assessment for environmental impacts, and Quadruple Bottom Line including personal meaning in design decisions.

The second major section (2.1.4) discusses traditional knowledge, examining the definitions, significance, and contributions of traditional knowledge and practices to sustainable development. Section 2.1.4 defines 'tradition' highlighting its dynamic and evolving nature whilst section 2.1.4.1 explores 'traditional knowledge' emphasizing its adaptive nature and critical role in agriculture, medicine, and environmental management. Following this, the

relationship between traditional knowledge and sustainability is discussed, focusing on environmental stewardship and resource management.

Section 2.1.5.1 explores how Indian spirituality and religious practices promote environmental sustainability. Section 2.1.5.2 examines how India's cultural diversity and traditional crafts inform contemporary design practices, with designers acting as intermediaries to preserve and revitalize traditional crafts. Specific examples of modern design innovations inspired by traditional Indian knowledge are presented to illustrate their potential in addressing contemporary challenges.

Finally, section 2.1.6 offers a general discussion and conclusion, synthesizing insights from the previous sections to reaffirm the importance of traditional knowledge and practices in fostering more sustainable ways of living. The chapter concludes by reflecting upon the literature and discussion leading to main research questions.

2.1 Introduction

Concerns about sustaining our world are not a recent phenomenon; visionaries through the ages have deliberated on the impact of human activities on Earth's ecosystems (Pezzey and Toman, 2002). Scientists claim that we are now in the Anthropocene - an epoch in which human activity shapes the planet's geological future, alongside natural occurrences such as ice ages and volcanic eruptions (Berkeley, 2011). The beginning of the Anthropocene, and unsustainability in general, is commonly traced back to the industrial revolution of the 1800s (National Geographic Society, 2023) and its production-to-consumption systems - which facilitated unprecedented development and, thereby, tremendous ecological devastation, forcing public attention on the need to recognize and cultivate sustainability globally (Edwards, 2005). However, the industrial revolution was not an isolated event; the conditions for its full-blown take-off were created over the course of human development and the production-to-consumption systems which focused on economic growth that underpinned this process (Rostow, 1971).

Economic modernization and industrial revolution in the late 18th century led to significant economic concentration in terms of industrial dominance, technical technological innovations, the pressure of economic growth and efficiency (Cusumano, 1992). At the same time, natural resources deteriorated, in western countries traditions based on communal living and nature-worship practices were eliminated spectacularly and drastically, urbanization accelerated in living quarters based on manufacturing industry (Maniates, 2019). The above-mentioned

processes initiated large scale migration of the population from rural areas into urban environments. Disturbed demographic equilibrium resulted in the rise of individualism over communitarianism (Dolfsma, 2004). Moreover, this led to a withdrawal in traditional values and religious beliefs (Ehrenfeld, 2013). Thousand-year-old pre-industrial systems were replaced with urban, industrialized and technocratic systems (Overy, 2007). Industrialization triggered exceptional levels of wealth and luxury and enormous increases in consumption, leading to environmental stress and unsustainable ways of life. Along with that came rising concerns about how to sustain our world (Pezzey & Toman, 2002).

As civilizations flourished after BCE, global legacies of nature-worship (Lloyd, 2008; Overy, 2007) were remodelled. In South Asia, tribal nature-worship crystallized into religions like Hinduism, Jainism and Buddhism (Lloyd, 2008; Overy, 2007). In other parts of Eurasia, religions like Judaism, Christianity and Islam (Lloyd, 2008) - coupled with the advent of Western scientific thought - shifted people's worldview from the pagan veneration of nature, to seeing nature as a hostile, alien and harsh (Ehrenfeld, 2008) resource to be harnessed (Lloyd, 2008) under the shield of technology. This gave way to the (predominantly western) approach of globalisation, a single worldview and modernist capitalism and consumerism.

2.1.1 Understanding Sustainability

Sustainability is a complex and multifaceted concept that has been discussed in different periods, contexts and across different areas of study. Here I will briefly discuss the evolution of the term as well as its use and meaning in contemporary literature and debate in response to the current unsustainable era. Caradonna (2014) discusses the origins of the concept tracing it back to the late 17th century in response to developing sustainable yield forestry. Whilst still a marginal idea, it developed as a concept during the Industrial Revolution, but it was not until the latter half of the 20th century (1970s) that sustainability developed as a more mainstream environmental programme with core elements including social, environmental and economic concerns (Du Pisani, 2006). In the declaration of the United Nations Conference on the Human Environment, held in Stockholm in 1972 as the first in a series of international conferences on the threatening ecological crisis, it was stated:

A point has been reached in history when we must shape our actions throughout the world with a more prudent care for their environmental consequences. Through ignorance or indifference, we can do massive and irreversible harm to the earthly environment on which our life and wellbeing depend. Conversely, through fuller

knowledge and wiser action, we can achieve for ourselves and our posterity a better life in an environment more in keeping with human needs and hopes . . . To defend and improve the human environment for present and future generations has become an imperative goal for mankind (United Nations, 1972, p. 3).

Sustainability featured in several of the principles adopted by the conference. It was now realized that development needed to be sustainable – it should not focus only on economic and social matters, but also on matters related to the use of natural resources. Today, one of the most widely cited definitions of sustainability is that offered by the Brundtland Commission Report 'Our Common Future'. It describes sustainability as “meeting the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987, p. 16). The report discussed the need to apply integrated, sustainable solutions to a broad range of problems related to population, agriculture and food security, biodiversity, energy choices, industry, and more. The Brundtland Report acknowledged the tension between economic growth and environmental protection. Other definitions of sustainability have been more explicit, for example the 2005 World Summit on Social Development recognised three goals for sustainable development: economic development, social development and environmental protection (United Nations, 2005). These elements, described as independent yet mutually reinforcing, are often referred to as the “three pillars of sustainability” and have been reduced down to ‘people, planet and profit’ (United Nations, 2005).

However, these definitions have been criticised because their meaning is easily reconstructed to support short-term business interests whilst the long-term ecological and environmental challenges are circumvented (Ehrenfeld and Hoffman, 2013). Many of these definitions and approaches are based on “triple bottom line”, the term coined by John Elkington in 1994 (Elkington, 1997). Later in 2018, after 25 years, Elkington moved to recall the term because, according to him, the intention of the term was to change perception towards capitalism and examine company’s social, environment, and economic impact equally. Instead companies only focused on economic gain rather than people and the planet. In his words “Clearly, the Triple Bottom Line has failed to bury the single bottom line paradigm” (Elkington, 2018). On a similar note, many argue that the ‘the type of growth that has been developing since the 1970s growth based economic paradigm causing environmental exploitation needs to be structurally challenged (Schumacher, 1973; Guattari, 1989; Jackson, 2014; Purdy, 2015).

Whilst the Brundtland Report offers a definition of sustainability and outlines many environmental and social problems, it does not challenge the dominant economic model that is

criticised for creating the problems (Ehrenfeld and Hoffman, 2013). Jackson (2014) explicitly argues that the dominant neoliberal economic paradigm that supports growth, expansion and profit is underpinning many of our sustainability challenges. He discusses the quality of prosperity and how the notion of rising prosperity has become synonymous with economic growth. Yet Jackson (2014) states that continued growth is impossible as we live on a finite planet with physical limits to resources and fragile ecosystems on which we depend on for survival. He believes that we need to radically restructure our economic model based on the reality of a finite planet with rapidly depleting resources. He states “prosperity consists in our ability to flourish as human beings - within the ecological limits of a finite planet. The challenge for our society is to create the conditions under which this is possible. It is the most urgent task of our times” (Jackson, 2014, p. 5).

Following a similar trajectory, Ehrenfeld and Hoffman (2013) offer a definition of sustainability as ‘sustainability-as-flourishing’ – “the possibility that humans and other life will flourish on the Earth forever”. Here sustainability is not understood as a fixed state or end goal but rather as an on-going process and property of a system. On an individual level it requires shifting from a state of having to a state of being, and on a systemic level it challenges how we understand and position ourselves in relation to nature (Ehrenfeld, 2013). To recognise and work towards sustainability-as-flourishing requires developing new values beyond economic growth and material-based consumption (Orr, 2002). Based on the approach of sustainability-as-flourishing, two years later New Zealand's governmental research agency Landcare Research and Dunham-Jones (2007), depicted sustainability as a braid, in consideration to its indigenous population and their contribution to sustainability and the economy. This representation shows interlinked social, environmental, cultural and economic dimensions which are stronger when interwoven together; when a single strand frays, it weakens the whole braid (Scrimgeour and Iremonger, 2004; Dunham-Jones, 2007).

In 2015 the United Nations developed 17 comprehensive sustainable development goals (SDG) for global and regional levels to end poverty, protect the environment and support well-being by 2030 (United Nations, 2020). However, the SDGs have been criticized for being inconsistent, difficult to quantify, implement and monitor. Disparaging analysis suggests that there exists a potential inconsistency in the SDGs, particularly between the socio-economic development and the environmental sustainability goals (Swain, 2018). Additionally, during the COVID-19 pandemic, researchers both outside and inside the UN questioned whether the goals are fit for the post-pandemic age due to the pandemic's exposure of critical weaknesses in global health systems, economic disparities, social inequalities, and the digital divide. They argue that the

SDGs need reassessment to better address these newly highlighted challenges and ensure effective global recovery and resilience (Nature, 2020).

Despite being continuously explored to reach their appropriate definitions, sustainability and sustainable development have been continuously applied in many fields, such as development programs, science and technology, agriculture, art, design, architecture, economy, social, cultural, and education, etc. Although each field would have a slightly different definition of what might be sustainable development, it seems that they all have something in common: solutions for processes, systems, materials or products and ability to maintain, support, sustain, endure, or keep a balance for an indefinite period. However, the idea of sustainability is complex and continuously evolving with multiple interpretations and applications (Reubens, 2010).

2.2 Design for sustainability

Design for sustainability is an area of contemporary research and practice that has emerged in response to the profound environmental, social and economical challenges that humanity faces. It spans a wide array of disciplines, activities and methods and has become significantly more relevant as the sustainability agenda has become recognised. Prior to 1970 there is no record of any books published in English containing the words sustainable or sustainability in their titles, yet since 1980 the number of books that directly deal with sustainability and design for sustainability has proliferated (Caradonna, 2014). The activity of designing, as understood within the remits of traditional design professions, is a process of inventive thinking and planning to create a product or service. Walker (2006) describes this as “a creative stage in which the designer seeks to apply general, abstract ideas in the process of developing specific, defined artefacts.” Papanek (1985) states, “The most important ability that a designer can bring to his work is the ability to recognize, isolate, define, and solve problems.”

Increasingly, design is being advocated as an instrumental activity in attempts to move towards a state of sustainability. As contributions to the field of design for sustainability have surged, its theoretical and philosophical foundations have strengthened (Walker, 2006; Bhamra and Lofthouse, 2007; Chapman and Gant, 2007; Thorpe, 2007; Walker, 2013; Ehrenfeld and Hoffman, 2013). Thorpe (2007) describes sustainable design as “theories and practices for design that cultivate ecological, economic, and cultural conditions that will support human wellbeing indefinitely”. Expanding on this, Walker and Giard (2013) describe design for sustainability as “an endeavour that calls upon human activity to imagine, conceptualize,

visualize, and effectively communicate alternative pathways for living meaningful lives while consuming far less in terms of energy and material". Ehrenfeld (2013) offers an understanding of the functions of design for sustainability as, "design is a process in which new action-producing structures are created and substituted for old ones such that routine acts change from the old, ineffective patterns to new ones that produce the desired outcomes". In this context, Ehrenfeld describes design as tactic not for designing temporary fixes to problems, but for designing new systems that change the context that the problems exist within, thus 'dissolving' the origin of the problem. He explains, "here the actors take a course that changes the context (that is, the underlying system creating the problem) such that the problem disappears" (Ehrenfeld, 2013). Alongside this idea, Walker states that as long as people keep maintaining their current lifestyles (i.e. consumerism, exploitation of Earth's resources) the significant progress towards sustainable development cannot be achieved (Walker, 2008).

Design is executed by trained, or professional, designers as well as by anonymous, or nonintentional, designers (Fuad-Luke, 2009). The prevalent mainstream design paradigm, which centres on the designer, design process and designed products (Walker, 1989), and the understanding that design is predominantly the domain of professional designers emerged during the industrial revolution (Walker, 1989; Fuad-Luke, 2009). This emergence, and the shifts in design priorities that followed, cannot be examined in isolation; they need to be viewed as part of a larger dynamic social and historical process (Walker, 1989). Interestingly, design and sustainability concerns, which had existed since time immemorial and crystallized during the industrial revolution.

The term 'Design for Sustainability' is used in this text both as a broad framework and as a specific design approach discussed in Section 2.3.6. As a framework, Design for Sustainability encompasses diverse methodologies, such as Biomimicry, Circular Economy, and Social Design that address ecological, social, and economic sustainability. The specific DfS approach, however, refers to strategies directly engaging with design principles aimed at integrating sustainability comprehensively into the design process.

2.2.1 The evolution of design: from craftsmanship to industrialization

Before industrialization, products were crafted locally and in limited numbers (Walker, 1989). A single craftsperson or a guild of craftspeople managed all the processes needed to envision, create, and sell a product. The industrial revolution, however, fragmented these integrated, artisan-based production-to-consumption systems into specialized disciplines, including design,

production, and marketing, aligning with the concept of division of labour to boost productivity and efficiency (Walker, 1989; Cusumano, 1992; Dormer, 1997) in Europe and the USA (Walker, 1989). Industrial designers became innovators, using logical design processes to visualize large production batches for extensive, distant markets. Design was redefined as “the art or action of conceiving of and producing a plan or drawing of something before it is made” (Oxford Dictionaries, 2016). Only when designers could visualize the entire process from concept generation to production, did design become exclusively linked with industry (Greenhalgh, 1997). This shift caused the industrial designer to become distinct from craftspeople and artists. Consequently, "late-20th century Western culture saw the separation of ‘design’ from ‘art’ and ‘craft,’ and the separation of ‘having ideas’ from ‘making objects’" (Peters, 1997, p.18).

2.2.2 The arts and crafts movement and its legacy

The Arts and Crafts Movement resisted industrialization, protesting against the social, cultural, and ecological evils - unsustainabilities - that it heralded. Proponents of the movement believed craft revival would humanize society by restoring social equilibrium and the cultural ethos of the past. While the movement had little to boast of in terms of concrete achievement, it laid the foundation for future design ideologies that would reflect socialist concerns (Fuad-Luke, 2009). These concerns were evident in the pursuit of archetypical products that equalized their users, typical of Bauhaus design, and, later, in the rationalist, functionalist, and modernist design that prevailed until World War II (Fuad-Luke, 2009). In a similar vein, communist ideals including erasing all forms of social distinction found expression through design, including by homogenizing fashion (Blaszczyk, 2011).

2.2.3 Post-war design and emerging sustainability concerns

The post–World War II generation, weary of one-size-fits-all design, demanded postmodern design pluralism (Fuad-Luke, 2009). As Europe’s industrial capabilities diminished due to war, the United States emerged as a global hub of manufacturing, exemplifying a consumer-driven ethos characterized by mass production and high consumption. This transformation was bolstered by a war economy transitioning into a peacetime economy, where industries shifted from producing military goods to consumer items like automobiles and household appliances. This shift was celebrated as the "American way," emphasizing progress through material consumption, but it rested on relentless resource exploitation (Higgs, 2021). Early concerns about sustainability were evident in discussions about the overuse of natural resources and the

potential need to rethink the insatiable consumer appetite (Higgs, 2014). Nevertheless, marketing-led consumerism continued to dominate Western design narratives into the 1960s, with growing critiques that it prioritized sales over genuine consumer needs (Whitely, 1993).

2.2.4 Design's concerns in the 1970s

The global ecological and social concerns that had been brewing through the 1960s reached crisis point in the 1970s, and affected design as well. Papanek's (1971) book, *Design for the Real World*, urged designers to introspect deeply about how they could contribute meaningfully to global social and ecological issues. Papanek called on designers to be accountable to, and driven by, global ecological and social needs, rather than the consumer-led economy. However, real-life ecological sustainability crises that were unfolding simultaneously seemed to drown out Papanek's call for social design, turning the spotlight almost exclusively onto ecological sustainability in the West.

The West Asian oil price-rise crisis of 1973 forced design engineers to give serious thought to ecological issues such as energy efficiency. The sudden spike in oil prices underscored the vulnerability of relying heavily on fossil fuels, prompting a shift towards more sustainable and energy-efficient design practices. This crisis highlighted the need for alternative energy sources and the development of products and systems that minimized energy consumption, leading to innovations in fuel-efficient technologies and the broader adoption of renewable energy solutions (Rapid Transition Alliance, 2019). Life-cycle thinking and life-cycle analysis emerged as a result (Fuad-Luke, 2009). Meanwhile, the social aspect surfaced among the alternative- and appropriate-technology practitioners who mushroomed across the world, proposing alternatives to capital-intensive industrial technology. The movement was popularized by Schumacher's (1973) book, *Small is Beautiful: Economics as if People Mattered*, which had precedents in Gandhi's swadeshi ideology (village industry scheme) (Bakshi, 1987), which advocated domestic production-to-consumption systems.

2.2.5 Green design in the 1980s

Mounting global environmental awareness gave rise to the green consumer of the 1980s (Whitely, 1993); this was a driver for 'green design'. Elkington formulated Ten Questions for the Green Designer, for a 1986 UK Design Council booklet, inviting reflection on life-cycle thinking and the green consumer (Chapman and Gant, 2007). Design for the Environment or ecodesign subsumed green design in the 1990s. Ecodesign aimed to create a win-win situation by

addressing both the ecology and the economy; it sought to minimize the negative ecological impacts of the product life cycle, while simultaneously offering financial benefits (Brezet and van Hemel, 1997).

2.2.6 The expanding scope of design post-1990

The scope of how design has sought to address sustainability concerns has expanded over the past 30 years, keeping pace with the expanding understanding of sustainability. Sustainability science has grown to acknowledge and encompass escalating and pressing global issues—including climate change, violence, food security, social responsibility, inclusion and poverty. This has set the stage for alternative design praxis—including slow design, social design, co-design, meta-design, Design for Sustainability (DfS), design for the base of the pyramid (BoP), design activism, participatory innovation, and design participation—all of which look beyond ecological sustainability (Fuad-Luke, 2009), to address the different and often disparate focal points which together comprise a compound picture of sustainability.

2.2.7 Emergent cutting-edge fields in design

The evolution of design in the 21st century reflects a growing recognition of the interconnectedness of ecological, social, and economic systems. Following the expansion of design's scope post-1990, as outlined in the previous section, the field has increasingly embraced novel approaches to sustainability that challenge conventional frameworks. As the urgency of global issues has intensified, design has shifted from traditional problem-solving paradigms toward more complex, systemic, and inclusive perspectives. The 21st century has seen the emergence of cutting-edge fields such as Transition Design, Pluriversal Design, Decolonial Design, More-than-Human Design, and Regenerative Design. These approaches push the boundaries of design by addressing ecological, cultural, and societal dimensions in innovative ways. However, each field also faces critiques and challenges in its practical implementation. Together, they reflect the ongoing transformation of design as it responds to an evolving global landscape, striving to create more sustainable and equitable futures.

Transition design

Transition Design emphasizes long-term systemic change toward sustainable futures by addressing the interconnectedness of ecological, social, and economic systems (Irwin, 2015). It advocates for cultural transformation and stakeholder collaboration to address complex

challenges, aligning with post-growth ideals by rejecting incremental growth in favor of resilience and equity. However, critics argue that its broad and systemic scope can dilute its applicability, making it challenging to implement in practice. Additionally, the dependence on multi-stakeholder engagement and long-term timelines often clashes with the urgency of immediate sustainability challenges, potentially stalling progress.

Pluriversal design

Pluriversal Design promotes the coexistence of diverse worldviews, emphasizing Indigenous and local knowledge systems as counterpoints to Western-centric design (Escobar, 2018). By advocating for a "world of many worlds," it critiques homogenized growth models and fosters cultural and ecological harmony. Yet, while its critique of hegemonic design practices is powerful, the abstract nature and philosophical foundations of Pluriversal Design can make it difficult to translate into concrete, actionable methods. Critics also argue that integrating divergent ontologies into mainstream design processes can create tension and misrepresentation, complicating its practical application.

Decolonial design

Decolonial Design seeks to dismantle colonial legacies in design by centering equity, justice, and the inclusion of marginalized voices (Tunstall, 2023). It critiques exploitative systems and promotes localized, human-centered solutions, providing a framework for addressing historical injustices and creating more equitable futures. However, some critics contend that Decolonial Design sometimes risks oversimplifying or romanticizing Indigenous and local practices, which can reinforce essentialist views. Moreover, efforts to decolonize design often encounter resistance in industries and systems deeply entrenched in globalized, capitalist frameworks, limiting their transformative potential.

More-than-Human design

More-than-Human Design challenges anthropocentric perspectives by incorporating the agency and needs of non-human entities, ecosystems, and species into design practices (Giaccardi and Redström, 2020). It advocates for coexistence and ecological balance, aligning with post-growth values. Despite its promise, a key critique of More-than-Human Design is its conceptual and speculative nature, which may lack clear practical applications. Balancing the interests of human and non-human stakeholders can also be complex, particularly in contexts where human survival needs conflict with ecological preservation, presenting significant ethical and operational challenges.

Regenerative design

Regenerative Design focuses on restoring and enhancing ecological and social systems, going beyond minimizing harm to actively creating positive environmental impacts (Gibbons, 2020). It draws on principles of biomimicry and permaculture to foster resilience and closed-loop systems. However, critics argue that Regenerative Design's ambitious goals often face significant challenges in scalability and cost-effectiveness. The approach requires a fundamental restructuring of systems and industries, which can be difficult to achieve in resource-constrained or policy-driven contexts, limiting its widespread implementation.

These emergent fields contribute critical perspectives to the sustainability discourse by addressing neglected dimensions such as equity, relationality, and ecological restoration. While they complement and critique post-growth and traditional design frameworks, their challenges ranging from scalability and implementation to philosophical abstraction highlight the complexity of designing truly sustainable systems. Together, these approaches provide fertile ground for rethinking the future of sustainable design, even as they confront the practical hurdles that must be overcome to bring their visions to life.

2.3 Approaches to design for sustainability

This section explores existing sustainability-aligned approaches and assessment systems, which can act as scaffolding for designers in their sustainability-design practice. Of the several approaches and assessment systems studied, only those approaches that explicitly aim to actualize sustainability are discussed below. This focus is due to the varying degrees to which any design approach or assessment system can align with sustainability, depending on the specific design problem and the individual designer's commitment to sustainability. As classifying the suitability of all existing design approaches and assessment systems for sustainability design was beyond the scope of this research, I limited my discussion to those with clearly stated sustainability-related intentions.

2.3.1 Natural Capitalism

The Natural Capitalism Framework (Hawken, Lovins and Lovins, 1999) also known as eco-efficiency (Schmidheiny, 1992) centres on the efficient use of natural, human, manufactured and financial capital. The framework advocates radical resource productivity (increasing the productivity of natural resources), ecological redesign (shifting to biologically-inspired models),

service and flow economies (shifting emphasis from products to services), and investing in natural capital (to build a strong resource base of finite natural resources) (Hawken, Lovins and Lovins, 1999). Natural capitalism is broad, and while this makes it easy to understand, it does not address some aspects of production-to-consumption systems, such as waste in sufficient detail (Shedroff, 2009). This approach does not address the social and cultural aspects of sustainability.

2.3.2 Cradle-to-Cradle

The Cradle-to-Cradle Framework (McDonough and Braungart, 2002) also known as C2C, or eco-effectiveness—focuses on closed-loop material flow of both technical and natural materials. C2C argues that products in the biosphere must be bio-degradable, and materials in the technosphere should be continuously up-cycled (McDonough and Braungart, 2002). Its key principles are materials health (safe materials that can be constantly recycled), materials reutilization (all materials must be constantly recycled), renewable energy (100% of energy used during product use and manufacture must be renewable), water stewardship (water must be managed so as to be clean), and social fairness (high labor standards) (Wever and Vogtländer, 2015). Some critics of C2C argue that it is biased towards technical materials and technological solutions, as opposed to natural materials and traditional technologies (Shedroff, 2009). Others argue that C2C is too simplistic to be applied to complex products (such as consumer electronics), which is evident in the fact that such examples are absent from the C2C roster (Bjørn and Strandesen, 2011). Neither does C2C account for the cost–benefit analysis of the energy and resources used in converting waste into usable material streams, nor the potential negative side-effects of natural nutrients being absorbed into ecosystems in the wrong quantities or locations (Bjørn and Strandesen, 2011). While the C2C framework offers detailed criteria and is accompanied by a tedious and stringent certification process (Shedroff, 2009), it calls for significant research and investments for new material technologies. C2C does not address sustainability’s social and cultural aspects including local production-to-consumption systems (Shedroff, 2009).

2.3.3 Biomimicry

Biomimicry (Benyus, 2002) centres on creating sustainable materials, products, services, and systems based on examples found in nature (Shedroff, 2009). This approach encourages designers to use nature as a model, measure, and mentor (www.biomimicry.net, 2015). Biomimicry extends beyond mimicking technical solutions from nature (biomimetics) to

replicating natural systems, such as the concept of closed material loops (Wever and Vogtländer, 2014). The Biomimicry Design Spiral is designer-friendly, presenting biomimetic principles in a format akin to the generic contemporary design process (Shedroff, 2009). Biomimicry also introduces Life's Principles, a checklist of design lessons from nature (Wever and Vogtländer, 2014). These principles include adapting to changing conditions, being locally attuned and responsive, using life-friendly chemistry, being resource efficient, integrating development with growth, and evolving to survive. Since the Biomimicry Approach is non-anthropocentric and nature-focused (Shedroff, 2009), it primarily addresses ecological sustainability. However, it does not encompass the social, economic, or cultural aspects of sustainability (Shedroff, 2009).

2.3.4 Ecodesign

Ecodesign or Design for Environment is an approach which introduces ecological criteria— with the aim of reducing the environmental impact of products at every stage of their life cycle, towards more sustainable production and consumption alongside traditional product design criteria, such as functionality, ergonomics and quality (van Hemel, 1998). Ecodesign goes beyond a product-centric focus to look at reducing the environmental impact of systems and services as well (Sherwin and Evans, 2000). As one of the earliest sustainability frameworks, Ecodesign has developed tools including guidelines, checklists and handbooks, screening/management methodologies and tools, and linked life-cycle assessments and databases (Fraunhofer IZM, 2005). Ecodesign began by addressing end-of-pipe issues (point sources of pollution), and over time progressed to clean production, and then on to the entire lifecycle (van Hemel, 1998). While later ecodesign projects aimed to optimize the entire socio-economic system of the product, the approach's original economic and ecological focus has prevailed as a priority increasing prosperity while decreasing environmental costs (Diehl, 2010). Ecodesign does not address the social and cultural dimensions of sustainability.

2.3.5 Emotionally durable design

Ecodesign strategies aim to extend product lifespan, but many products are discarded while still functional due to psychological obsolescence driven by changing user needs and trends (Cooper, 2004, 2010). Emotionally Durable Design, or Design for Product Attachment, seeks to strengthen the user-product relationship to counteract this (Chapman, 2005, 2008; Mugge, 2007). Emotional connections are crucial, with key determinants being self-expression, group

affiliation, memories, and pleasure (Mugge, 2007). Design strategies include enabling personalization (Mugge, Schoormans and Schifferstein, 2009), creating products that age gracefully and capturing memories (Chapman, 2005). While promising, this approach faces challenges. Effective stimulation of attachment is difficult due to the subjective nature of user perceptions and cultural influences (Chapman, 2005). Some products, especially utilitarian ones, may not benefit from these strategies (Mugge, Schoormans and Schifferstein, 2005). Additionally, extending the lifespan of certain products might not be environmentally beneficial if their main impact is during the use phase (Vezzoli and Manzini, 2008). Manufacturers may also resist these strategies due to potential sales declines (Mugge, Schoormans and Schifferstein, 2005). Further research should explore product attachment over entire lifespans, test strategies across various product categories, and examine the role of culture and values in attachment (Mugge, 2007).

2.3.6 Design for Sustainability

Design for Sustainability (DfS) or Sustainable Product Design is an approach that addresses social, ecological and economic sustainability (Crul and Diehl, 2006) and addresses sustainability assessment and business generation for emerging markets. Design for Sustainability includes three levels of innovation for products and systems - incremental, radical and fundamental; and three sub-approaches to these - redesign, new product development and product service system (Crul and Diehl, 2006). The DfS redesign approach comprises 10 steps with corresponding tools to facilitate these, including an impact-assessment matrix, DfS strategies and rules of thumb. The DfS approach also has a mechanism to compare the finished redesigned product with the original, so as to map the efficacy of the sustainable-design input (Crul and Diehl, 2006). This approach also presents tools to facilitate policy formulation and business creation (Castillo, Diehl and Brezet, 2012). It is an upgrade of Ecodesign, which is perhaps why it retains an ecological priority, and addresses economic, ecological and social factors. However, it needs to address a larger spectrum of social issues and include cultural issues in its format to address sustainability holistically.

2.3.7 Design for sustainable behaviour

Ecodesign strategies aim to minimize environmental impacts throughout a product's lifecycle (Pigozzo, McAloone and Rozenfeld, 2015), but often overlook how user behaviour significantly affects these impacts, especially in energy use (Sherwin, 2000; Sherwin and Evans, 2000; Tang

and Bhamra, 2009). Consequently, researchers have developed methods to influence user behaviour towards sustainability (Rodriguez and Boks, 2005; Lilley, 2009), rooted in various behaviour change theories. Examples include the Design for Sustainable Behaviour model (Lilley, 2009; Bhamra, Hernandez and Mawle, 2017) and Design with Intent (Lockton, Harrison and Stanton, 2010). These approaches commonly aim to make sustainable behaviours easier and unsustainable behaviours harder, encourage sustainable actions, and discourage unsustainable ones (Niedderer *et al.*, 2014). Their applications span product and service design, mobile interfaces, and built environments, focusing on both environmental and social sustainability (Tang and Bhamra, 2009; Niedderer *et al.*, 2014).

However, there are challenges, such as ethical concerns about influencing behaviour (Berdichevsky and Neuenschwander, 1999; Brey, 2006), lack of metrics for effectiveness, understanding environmental trade-offs, and limited business incentives (Lilley and Wilson, 2013; Niedderer *et al.*, 2014). Future research should develop better assessment metrics, test strategy effectiveness, expand the scope of behaviours and user groups, and integrate DfSB approaches into innovation processes (Wever, 2012; Coskun, Zimmerman and Erbug, 2015; Zachrisson *et al.*, 2016).

2.3.8 Design for social innovation

Achieving sustainability requires both technological and social innovations (Geels, 2005). Traditionally treated separately, these approaches are now recognized as complementary. Technological innovations target environmental issues through radical shifts driven by policies and new technologies (Wüstenhagen *et al.*, 2008). Social innovations address social problems and promote behavioural change (Manzini, 2007; Schaltegger and Wagner, 2008). Social innovations often emerge from community creativity and are supported by professional designers who enhance visibility, user experience, and scalability (Manzini, 2019). While designers bring valuable skills, criticisms highlight the need for more substantial and affordable solutions (Hillgren, Seravalli and Emilson, 2011).

Research has shifted from documenting cases to exploring designers' roles and developing toolkits (e.g., Murray, Caulier-Grice and Mulgan, 2010). Current focus includes supporting the replication and scaling of social innovations (Hillgren, Seravalli and Emilson, 2011; Manzini and Rizzo, 2011). Combining both technological and social innovations is essential to address systemic sustainability challenges effectively (Ehrenfeld, 2008).

2.3.9 Circular Economy

Circular Economy is a framework that draws on principles from Biomimicry, Industrial Ecology, Cradle-to-Cradle, and Blue Economy (Ellen MacArthur Foundation, 2013) towards creating an industrial economy which produces no waste or pollution, with separate biological and technical nutrient flows. The concept advocates looking at the systemic picture, rather than focusing on its separate components. The methods to realize a circular economy include methods from the approaches on which it draws, and also from newer approaches such as ReSolve - regenerate, share, optimize, loop, virtualize and exchange (Zils, 2014). Newer strategies towards the circular economy also include creating longer lasting products (Bakker and Hollander, 2013). Since the circular economy draws on approaches with an ecological and economic focus, it retains their priorities. It fails to address cultural issues, consumption values and addresses social issues only to a limited degree (Bjørn and Strandesen, 2011).

2.3.10 Product-service system innovation

Product innovation alone, while essential for reducing environmental impact, is often insufficient due to increased consumption offsetting gains (Brookes, 2000; Binswanger, 2001). Consequently, there is a shift towards structural changes via Product-Service Systems (PSSs) (Tukker and Tischner, 2006). PSSs combine products and services to deliver functions (Mont, 2002; Tukker and Tischner, 2006), promoting access over ownership. PSSs can decouple economic value from material and energy use, incentivizing resource efficiency (Stahel, 1997). They also offer strategic advantages like enhanced competitiveness and customer relationships (Gebauer and Friedli, 2005). Designing PSSs requires systemic approaches and has led to tools for visualization, environmental integration, and collaborative networks (Dewberry *et al.*, 2013; Ceschin *et al.*, 2014). Recent research expands PSS design to include socio-ethical dimensions and applications in low-income contexts (Vezzoli *et al.*, 2015). Challenges include altering consumer habits, organizational changes, and regulatory adjustments (Mont, 2002). Future research needs include understanding user behaviour, diffusion processes, and effective knowledge transfer (Tukker and Tischner, 2006; Vezzoli *et al.*, 2015).

2.3.11 Life-Cycle Assessment

Life-Cycle Assessment (LCA) examines the materials and energy consumed, and emissions produced throughout the product's life cycle, including extraction of raw material, processing of

materials, manufacturing of components, assembly and packaging, installation and use, service, upgrading and maintenance, and disposal and recycling. The selection of the system being analysed, its boundaries and its functions, is very important as this determines the inputs into the assessment, which directly affect the output or result (Wever and Vogtländer, 2015). LCA calculates the materials, energy and emission at each node of the production-to-consumption system or process (Shedroff, 2009). This makes it impossible to use unless the product exists, ruling out its use for the design-and-development stage (Shedroff, 2009). LCA focuses primarily on ecological analysis (Shedroff, 2009). It fails to address social, economic and cultural issues (Finkbeiner *et al.*, 2010; Lehmann *et al.*, 2011).

2.3.12 Quadruple Bottom Line (QBL)

Walker states that the current idea of sustainable development only promotes a partial solution. It addresses some of the important issues of environmental stewardship, social justice, and economic security, but it often lacks ideas that nurture and develop the inner person. It should also reflect "a way of acknowledging our values and beliefs, and ascribing meaning to our activities" (Walker, 2008). In order to make meaningful and lasting contribution, sustainable development must embrace the vital aspects of human culture (Walker, 2014a). Based on John Elkington's book "Cannibals with Forks: The Triple Bottom Line of 21st Century Business" (1997), and considering the inadequacy of Elkington's 'triple bottom line' (TBL) (Elkington, 2018), the QBL extends the traditional triple bottom line by incorporating a dimension of personal meaning alongside economic, social, and environmental considerations. The main idea is that social and environmental inputs and outputs are equally important in a design decision process. The QBL adds the personal meaning dimension and moves the economy dimension to the background, seeing it as a means and not the end of the design process. The QBL is rooted in human values and traditional understandings of 'meaning' (Walker, 2014a).

The QBL, in contrast to TBL, prioritizes Personal, Social and Practical Meaning, which involve, respectively, inner or spiritual values (personal); compassion, benevolence, equity and justice (social); and pragmatic benefits while also taking care of the nature and place, which includes avoidance of waste, reducing transportation distances of materials and products i.e. more localization. The Economic element of the QBL is not a "meaning" but a "means" – which lies at a second order and is the means for achieving the other three, i.e. not an end in itself (Walker, 2011a). Corresponding to these three aspects of being human are levels of meaning that can be

referred to respectively as practical meaning, social meaning, and personal (or inner) meaning (Walker, 2011a). Quadruple bottom line comprises:

- Practical Meaning: providing for physical needs while ameliorating environmental impacts;
- Social Meaning: ethics, compassion, equity and justice;
- Personal Meaning: conscience, spiritual well-being, questions of ultimate concern;
- Economic Means: financial viability, but not as an end in itself (Walker, Evans and Mullagh, 2019d).

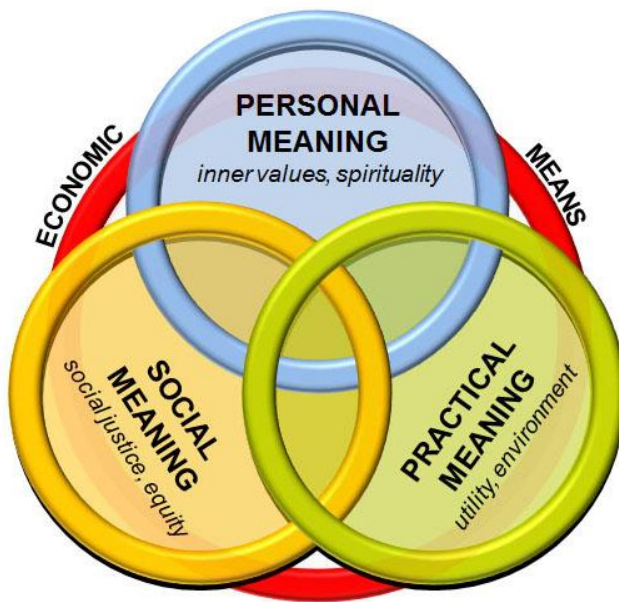


Figure 2 Quadruple Bottom Line (Walker, 2011)

According to Mullagh, Walker and Evans (2019) “by using this lens, the worldview so reliant upon rationalization, objectivity and scientific approaches can be challenged and a more meaningful and ultimately sustainable paradigm for design can emerge that embraces: rational and intuitive thinking; objectivity and subjectivity; detailed analytical approaches and more holistic synthetical approaches”.

Notion of personal meaning in QBL

According to Brahma Kumaris (2014), “spirituality is the heart of sustainability”.

The loss of humanity’s spirituality and original value system has led to unsustainable patterns of living. Regaining balance and harmony in our world requires a reawakening of human consciousness, whereby ‘hot heads and cold hearts’ are transformed into

‘cool heads and warm hearts’. Spirituality is living a life based on inner guiding principles - a life which naturally embraces the wellbeing of the individual, the family, the community and the world. (Brahma Kumaris, 2014)

Walker's QBL framework avoids using the term ‘spirituality’ because it can be interpreted in diverse ways, often carrying personal, cultural, or religious connotations that vary widely among individuals and communities (Walker, 2011). Instead, Walker focuses on concepts like personal meaning and ethical values to ensure inclusivity and clarity. This approach aims to provide a universal framework that can resonate broadly across different contexts and beliefs without being confined to specific spiritual or religious interpretations (Walker, 2011).

Therefore the notion of ‘personal meaning’ is preferred over spirituality due to the connection of spirituality with religion – the latter becoming increasingly neglected, particularly in the West (Walker, 2011, p. 187). Walker’s interpretation of personal meaning extends John Hick’s proposition of natural, ethical, and religious meanings (Hick, 1989) to include not only religion but also contemporary, non-religious, or atheistic forms of spirituality. These three major facets of human meaning span physiological aspects of being human, social relationships, and personal values and spiritual growth, both religious and atheistic. The QBL encompasses these priorities and includes personal meaning (understood as spirituality plus the personal ethic and values that emerges from attention to inner growth), social responsibility, and environmental care. Consequently, economic concerns are reconceptualized as instrumental rather than ultimate, positioning them as facilitators of broader human flourishing.

Spiritually useful design can generate artefacts that draw upon tradition, that are more stable and whose appeal is not dependent on originality, newness or technological progress. As such, they represent a radical departure from much of today’s consumer-driven product design - a departure that is urgently needed if current, highly damaging and potentially ruinous priorities are to be challenged and redirected. They are also consistent with wisdom teachings and unchanging notions of meaning, unity and deeper human purpose (Walker, 2014b, p. 81)

By spiritually useful design, Walker refers to functional objects associated with wisdom traditions relating to individual (inner) meanings and values such as virtue and compassion (Walker, 2014a). The QBL builds up a worldview that sustainability is a state of meaning-making through both collective creation and individual inner growth. It advocates a balance of sustainable development between the external and internal, and sets new values for design such as evolving continuously, accommodating change, maintaining and repair, more

considered and less distracting design (Walker, 2011, p. 133-134). These design values emphasize the ideas of slow change, continuity, attentiveness and connection which can be found in local craft production and traditional practices. These values also resonate with the propositions of many other scholars, for example, Manzini (2014) put the cosmopolitan localization at the central place of design for sustainability and social innovation. Scruton (2012, p.399) argues that the spirit and sense of being sustainable can be found through community, family and home practices, and traditions. According to Van der Ryn and Cowan (2007), sustainability is embedded in processes that have occurred over a long period of time in particular places, e.g., “a steady process of cultural accretion practiced by local craftsmen” (Van der Ryn and Cowan, 2007, p. 85). Although the QBL provides a holistic approach to sustainable design, especially through ‘New Design Values for the Quadruple Bottom Line’ (Walker, 2011), there is a need for a more actionable and accessible framework to better guide designers. As it stands, the QBL has mostly been used as a lens to analyse and examine craft practices, traditional enterprises etc. (see, (Zhan and Walker, 2017; Mullagh, Walker and Evans, 2019; Bin Mohamad, 2021; Zhang, 2022)).

Because of its close relationship to human values, localization, spirituality, traditional knowledge and craft, the QBL will be used as a framework for this research in analysing the autoethnographic case studies and build upon the finding later in chapter 4, 5 and 6.

Table 1 below summarises the main characteristics of design for sustainability approaches discussed above.

Table 1 Main characteristics of DfS approaches

Approach	Focus	Key Principles	Strengths	Limitations
2.1.3.1 Natural Capitalism	Focuses on efficient use of natural, human, manufactured, and financial capital.	Increase the productivity of natural resources. Shift to biologically-inspired models. Emphasize services over products. Build a strong resource base of finite natural resources.	Broad and easy to understand.	Does not sufficiently address waste management in production-to-consumption systems. Lacks emphasis on social and cultural aspects of sustainability.
2.1.3.2 Cradle-to-Cradle	Closed-loop material flow for both technical and natural materials.	Use safe materials that can be constantly recycled. Ensure all materials are constantly recycled. Utilize 100% renewable energy for product use and manufacturing. Manage water to maintain cleanliness. Uphold high labour standards.	Offers detailed criteria and a stringent certification process. Promotes a sustainable approach to material use and recycling.	Tends to favour technical materials and technological solutions over natural materials and traditional technologies. May be too simplistic for complex products, such as consumer electronics. Does not account for the energy and resource costs of converting waste into usable materials. Fails to address sustainability's social and cultural aspects, including local production-to-consumption systems.
2.1.3.3 Biomimicry	Creating sustainable materials, products, services, and systems inspired by nature.	Using natural examples to guide design. Emulating natural systems where materials are continuously cycled.	Biomimicry Design Spiral aligns with contemporary design processes. Addresses a wide range of ecological sustainability principles.	Primarily focuses on ecological aspects, overlooking human-centric concerns. Does not sufficiently address the social, economic, or cultural dimensions of sustainability.
2.1.3.4 Ecodesign	Reducing environmental impact throughout the product life cycle, alongside traditional design criteria (functionality, ergonomics, quality).	Addressing environmental impact from production to disposal. Extending beyond products to reduce environmental impacts of systems and services.	Comprehensive tools and methodologies to guide sustainable design. Integrates environmental considerations throughout the product lifecycle.	Primarily economic and ecological, with less emphasis on social and cultural sustainability dimensions. Focuses on end-of-pipe solutions, but do not expand to broader lifecycle impacts.
2.1.3.5 Emotionally durable design	Extending product lifespan by strengthening the user-product relationship. Countering psychological obsolescence driven by changing user needs and trends.	Self-expression, group affiliation, memories, and pleasure are crucial for creating strong user-product bonds. Allowing users to personalize products to enhance attachment. Designing products that age well and capture memories.	Strengthens emotional bonds, potentially reducing waste from early product disposal. Focuses on user experience and satisfaction, leading to longer product lifespans.	Difficult to effectively stimulate attachment due to individual perceptions and cultural influences. Strategies may not be suitable for utilitarian products or those with significant environmental impacts during the use phase. Does not examine the Examining the role of cultural values and perceptions in fostering attachment.

2.1.3.6 Design for Sustainability	Addressing social, ecological, and economic sustainability. Sustainability assessment and business generation for emerging markets.	Three levels of innovation: incremental, radical, and fundamental. 10-step redesign approach with tools for impact assessment, DfS strategies, and rules of thumb.	Comprehensive integration of social, ecological, and economic factors. Detailed methodology for sustainable product and system redesign.	Needs broader inclusion of social issues. Lacks focus on cultural aspects of sustainability. Retains a strong ecological priority, which may overshadow other dimensions.
2.1.3.7 Design for sustainable behaviour	Minimizing environmental impacts through influencing user behaviour towards sustainability. Addressing energy use and other behaviour-driven impacts.	Utilizing behaviour change theories to design products, services, and environments that encourage sustainable actions and discourage unsustainable ones. Application across various domains including product/service design, mobile interfaces, and built environments.	Directly targets user behaviour, a significant factor in the environmental impact of products. Incorporates insights from behaviour change theories to design more effective interventions. Focuses on both environmental and social sustainability.	Ethical concerns regarding the influence of user behaviour. Lack of robust metrics to assess the effectiveness of behaviour change strategies.
2.1.3.8 Design for social innovation	Integrating technological and social innovations to achieve sustainability. Addressing social problems and promoting behavioural change through community creativity and professional design support.	Technological innovations target environmental issues through policy-driven radical shifts and new technologies. Focuses on community-driven solutions to social problems, enhanced by designers to improve visibility, user experience, and scalability.	Combines technological and social approaches, leveraging their complementary strengths. Supports community creativity and empowers local solutions. Professional design input enhances the effectiveness and reach of social innovations.	Criticisms regarding the need for more substantial and affordable solutions. Challenges in balancing the roles of community input and professional design. Requires ongoing research to refine designers' roles and develop effective toolkits.
2.1.3.9 Circular Economy	Creating an industrial economy that produces no waste or pollution. Utilizing principles from Biomimicry, Industrial Ecology, Cradle-to-Cradle, and Blue Economy.	Separation of biological and technical nutrient flows. Systemic perspective over isolated components. Emphasis on creating longer-lasting products.	Comprehensive integration of ecological and economic sustainability. Encourages resource efficiency and waste minimization. Promotes innovative business models and product designs. Draws from well-established sustainability approaches, enhancing its credibility and applicability.	Limited focus on cultural issues and consumption values. Social issues are only addressed to a limited extent. Implementation can be complex and resource-intensive, requiring significant systemic change.
2.1.3.10 Product-service system innovation	Integrating products and services to deliver functional outcomes. Shifting from ownership to access models to enhance resource efficiency.	Decoupling economic value from material and energy consumption. Promoting resource efficiency through systemic approaches. Enhancing competitiveness and customer relationships.	Encourages sustainable consumption patterns. Provides strategic business advantages. Offers tools for environmental integration, visualization, and collaborative networks. Expands applicability to socio-ethical dimensions and low-income contexts.	Challenges in altering consumer habits and organizational structures. Requires regulatory adjustments. Necessitates comprehensive understanding of user behaviour and effective knowledge transfer.

2.1.3.11 Life-Cycle Assessment	Analyses materials, energy consumption, and emissions across a product's life cycle. Covers extraction, processing, manufacturing, assembly, use, service, disposal, and recycling stages.	Requires clear definition of system boundaries and functional units. Uses either process-based or input-output approaches to quantify impacts. Emphasizes environmental impact assessment.	Provides detailed ecological analysis of products. Guides decisions on material selection and process optimization. Offers quantitative data to support sustainability claims and certifications.	Focuses predominantly on ecological aspects, neglecting social, economic, and cultural dimensions. Resource-intensive and complex methodology may be impractical for early design stages.
2.1.3.12 Quadruple Bottom Line	Integrates economic, social, environmental, and personal meaning considerations into design and sustainability frameworks.	Emphasizes inner values, spiritual growth, and personal ethics. Focuses on ethics, compassion, equity, and justice. Addresses physical needs while minimizing environmental impacts. Views economic aspects as instrumental to achieving broader human flourishing.	Recognizes and incorporates the importance of spirituality, personal values, and ethical considerations in sustainable development. Provides a holistic framework that encourages balanced human development. Supports the creation of designs that are rooted in tradition, wisdom, and community practices, promoting sustainability through cultural continuity and local craft.	May face challenges in operationalizing personal and spiritual aspects in design. Could require adaptation to different cultural contexts where values and meanings vary widely. Emphasizes qualitative dimensions, which can be harder to quantify and integrate into traditional metrics of sustainability.

2.4 Tradition

The word 'tradition' relates to any defined understanding, technique, practice, faith/belief, custom, habit, legend, or story that has been handed down or transferred from generation to generation, particularly through oral communication or practice (Shils, 1981). "It is a set of practices created in the past that are purposefully maintained by the group in the present" (Green, 1997). As Edward Shils (1981) notes, the tradition handed down may include material items such as houses, landscapes of monuments, carvings, paintings, books, instruments, and machines as well as methods of convictions, beliefs and practices. Shils views tradition as something that represents continuity: "it is the past in the present but it is a much part of the present as any very recent innovation" (Shils, 1981). Tradition is seen as a body of customs, thoughts or practices belonging to particular country, people, family, or institution that is still practiced over a relatively long period.

At the same time, Valerie Kuletz (2000) argues: "tradition is not static, but flexible, which is what it must be in order for pre-colonial knowledge and practice to survive". The reason why tradition is able to survive is because it closely fits to the needs, values, and interests of the people who uphold it (Uphoff, 1996). All of these ideas from Shils, Green, Canan and Kuletz, and Uphoff confirm that the tradition is the thing that is flexible and keeps developing from one generation to another to serve and suit human lives.

The word tradition is also used to express the state of being old or out of date and often associated with something old, of a past time, outdated, preindustrial, indigenous, primitive, or vernacular; the opposite of modernity (Nugraha, 2005). Tradition might also represent "something ancient; means old and outdated and does not have potential for a new life" (Abdul-Wahab, 2008). This conception views tradition as a state of being old, past beliefs, or past practices; as a set of pre-existing values that are not influenced by modern manners or creations (Green, 1997). This is why we often find some common expressions that treat tradition as art of the past and always contrasted with 'newness', in such contradictory phrases as 'tradition and avant-garde', 'tradition and modernity', 'tradition and innovation', and 'tradition, present and future'.

This second conception of the term tradition no longer reflects a strong sense of continuity as defined in former definitions. Thus, the term 'traditional practices' would then mean a practice that represents the entire use of old materials, ancient needs, ancient techniques and tools, and old shape and functionality, which usually belong to particular places, time and cultural

conditions in the past which might not be relevant to today's modern-day regimes and practices.

2.4.1 Traditional knowledge and practices

'Traditional knowledge' refers to "a cumulative body of knowledge, belief and practice, evolving by adaptive processes and handed down through generations by cultural transmission" (Berkes, Colding and Folke, 2000). The study of traditional knowledge began with the study of species identifications and classification (ethnobiology), and proceeded to considerations of peoples' understandings of ecological processes and their relationships with the environment (Cordell, 1995; Berkes, 2000).

Terms 'tradition', and 'traditional' have varied definitions and interpretation. According to Warren (1995), 'traditional' denoted the 19th-century attitudes of simple, savage and static. For this reason, some scholars favour the term 'indigenous knowledge' (Warren, 1995).

Nevertheless, the 'traditional ecological knowledge' term established its wide use among others. No universal definition is available, and many terms are used to establish what indigenous people know (Gadgil, Berkes and Folke, 1993), including traditional knowledge or traditional ecological knowledge, local knowledge, indigenous knowledge or science, folk knowledge, and tacit knowledge.

In recent years interest in traditional knowledge has been growing. On the one hand due to erosion of traditional/indigenous knowledge and communities and urgency to protect and preserve them, on the other hand due to a recognition that such knowledge can contribute to the conservation of biodiversity (Gadgil, Berkes and Folke, 1993), rare species (Berkes, Colding and Folke, 2000), protected areas (Johannes, 1989), ecological processes (Alcorn, 1989) and to sustainable resource use in general for sustainable future (Schmink, Redford and Padoch, 1992). Other scholars (Pierotti and Wildcat, 2000; Nugraha, 2005; Kimmerer, 2006; Martin *et al.*, 2010; Reubens, 2010; Harisha, Padmavathy and Nagaraja, 2016; Chisholm Hatfield *et al.*, 2018; Walker, Evans and Mullagh, 2019b, 2019d; Albarrán González, 2020) share an interest in research practice and applied projects around traditional knowledge for scientific, social, or economic reasons across various subjects like climate change, water conservation, medicine, medical practices like child birth, agricultural techniques, architecture and building techniques, traditional making and crafts, heritage art forms like painting, dance and music, along with conservation and preservation of heritage, and intellectual property rights.

Traditional practices are dynamic processes and vital elements of culture. They reflect values and beliefs held by members of a community for periods often spanning generations. The analysis of many traditional knowledge systems shows that there is a component of local observational knowledge of species and other environmental phenomena, a component of practice in the way people carry out their resource use activities, and further, a component of belief regarding how people fit into or relate to ecosystems. In short, traditional knowledge is a knowledge–practice–belief complex (Berkes, Colding and Folke, 2000). Gadgil (1993) recognises that traditional knowledge and practices are attributes of non-industrial or less technologically advanced societies with historical continuity in resource efficient practices, not all of them indigenous or tribal. These societies have acquired the knowledge base over hundreds of years through direct experience and contact with physical, spiritual, mental, emotional, and intuitive relationships with all aspects and elements of their environment (Whyte, 2013).

Today traditional practices around the world are constantly struggling to survive and flourish, in a system still dominated by a western worldview (Mazzocchi, 2006). They face the challenge of living in two worlds, the traditional and the modern/western one, in constant tension with each other, with the latter having more power in shaping the former (Berkes, Colding and Folke, 2000). Yet, many societies have managed to survive for centuries adapting in many different traditional ways to adverse climate conditions and managing to create sustainable livelihood systems. Their diverse forms of knowledge, deeply rooted in their relationships with the environment as well as in cultural cohesion, have allowed many of these communities to maintain a sustainable use and management of natural resources, to protect their environment and to enhance their resilience; their ability to observe, adapt and mitigate has helped many communities face new and complex circumstances that have often severely impacted their way of living. For example, the African Sahel region is characterized by severe and frequent droughts with records dating back into centuries. The local populations in this region, through their indigenous knowledge systems, have developed and implemented extensive mitigation and adaptation strategies that have enabled them reduce their vulnerability to past climate variability and change, which exceed those predicted by models of future climate change (Nyong, Adesina and Osman Elasha, 2007).

2.4.2 Issues with referring back to and using traditional knowledge in western practices

Integrating traditional knowledge into Western practices has sparked considerable debate, primarily due to the colonial and extractive approaches historically employed by researchers

and scientists (Mazzocchi, 2006). Traditional knowledge, developed over centuries by indigenous and local communities, is increasingly recognized for its value in fields like environmental management, medicine, and sustainable development (Gadgil, Berkes and Folke, 1993; Payyappallimana and Koike, 2010; Gómez-Baggethun, Corbera and Reyes-García, 2013). However, the appropriation and utilization of this knowledge by Western entities raise significant ethical and practical concerns. Western science and traditional knowledge systems differ fundamentally in their approaches to creating and transmitting knowledge. Western science is analytical, reductionist, positivist, and materialist, whereas traditional knowledge is intuitive, holistic, spiritual, and integrates empirical observations with sacred beliefs (Nakashima and Rou', 2002). These differences make it challenging to compare and integrate the two systems using the criteria of one to analyse the other (Rutten, 2018).

A primary issue with incorporating traditional knowledge into Western practices is the colonial mindset that has historically characterized such endeavours. Western researchers often extract empirical observations from indigenous cultures without understanding or respecting their contexts, reflecting a colonial history that marginalized and devalued indigenous knowledge (Smith, 2021). Misappropriation of traditional knowledge occurs when it is used out of context or without the consent of the knowledge holders, leading to the commodification of sacred or culturally sensitive information (González, 2020). For example, traditional medicinal practices might be commercialized without fair compensation or acknowledgment to the communities that developed them (Coombe, 1998). Ethical concerns are central to the discourse on traditional knowledge utilization. Intellectual property laws in Western contexts often fail to protect the collective nature of traditional knowledge, favouring individual ownership models that do not align with indigenous perspectives (Picart, 2016). This legal gap allows corporations and researchers to patent traditional practices and products without proper benefit-sharing with source communities (Brush, 1993). Analysing traditional knowledge solely using scientific criteria risks distorting these systems (Nakashima and Rou', 2002).

However, some case studies highlight the potential for respectful integration. For instance, traditional fire management practices by indigenous Australians have been acknowledged for effectively managing bushfires, with success attributed to the active involvement and leadership of indigenous communities (Ens *et al.*, 2010). This example emphasizes the need for a participatory approach, which is not merely a methodological tool but an epistemic and ontological shift. Epistemically, a participatory approach challenges the notion of knowledge as a commodity to be extracted from a singular source. Instead, it views knowledge as co-constructed through shared experience, collective wisdom, and reciprocal relationships

between communities, researchers, and stakeholders. Ontologically, this approach recognizes that knowledge cannot be detached from its cultural and social context. It stresses the interconnectedness of humans, practices, and environments, where the act of knowing is always embedded in a particular place and culture.

In the context of this research, a participatory approach is foundational, as it facilitates a deeper understanding of how traditional knowledge is continuously sustained, adapted, and applied within local communities, particularly in relation to sustainable practices. Rather than focusing on isolated artisans or individual craftspeople, this research embraces the collective role of the community in the production and application of knowledge. The process is tacit and dynamic, wherein both the researcher and the community engage in an ongoing dialogue, and knowledge is shared, questioned, and redefined in context. Such a participatory process not only generates new knowledge but also fosters a more inclusive, ethical, and context-specific understanding of sustainability, moving away from one-size-fits-all solutions. This approach underlines the importance of recognizing the value of community-driven practices, which can offer practical, culturally appropriate, and sustainable solutions that go beyond the limitations of Western scientific paradigms.

Philosophers like Paul Feyerabend and Gregory Bateson argue that Western science should not be the sole criterion for determining truth, emphasizing that knowledge is culturally contextual (Bateson, 1979; Feyerabend, 1987). This perspective supports the view that traditional knowledge systems offer valuable insights that complement the empirical methods of Western science (Freeman, 1992). To integrate traditional knowledge ethically, a fundamental shift away from colonial and extractive approaches is needed (Tuck and Yang, 2012). Respect for the cultural context and intellectual property rights of traditional knowledge holders is crucial (Lopez, 2023). Moving forward, a decolonized approach should ensure active participation, fair compensation, and acknowledgment of indigenous communities for the respectful integration of traditional knowledge into Western practices (McGregor, 2004; Sium, Chandni and Ritskes, 2012).

2.5 Traditional knowledge and sustainability

Traditional practices are holistic in outlook and adaptive by nature, gathered over generations by observers whose lives depended on this information and its use. These practices often accumulate incrementally, tested by trial-and-error and transmitted to future generations orally or by shared practical experiences (Dudgeon and Berkes, 2003). Everyday traditional practices

are a combination of knowledge, experience, tradition, places, locality, all living and non-living things, skills, practices, theories, social strategies, moments, spirituality, history, heritage, and more; and may not be fully embraced by people who fail to understand all those dimensions (Pierotti and Wildcat, 2000).

Traditional practices have developed a concept of the environment that emphasizes the symbiotic character of humans and nature into everyday lifestyle. It offers an approach to local development that is based on co-evolution with the environment, and on respecting the carrying capacity of ecosystems (Clarke, 1990). These practices are based on long-term empirical observations adapted to local conditions, ensuring a sound use and control of the environment, and enabling communities to adapt to environmental changes (Clarke, 1990). Moreover, it supplies much of the world's population with a holistic worldview and the principal means to fulfil their basic needs, and forms the basis for decisions and strategies in many practical aspects, including interpretation of meteorological phenomena, medical treatment, water management, production of clothing, navigation, agriculture and husbandry, hunting and fishing, food preservation and preparation, materials and its utilitarian aspects and biological classification systems (Nakashima and Rou', 2002). In "The Cultural Dimension of Development" a number of scholars from multi-disciplinary fields generated further discussion on traditional knowledge systems and their roles in the development process (Warren, Slikkerveer and Brokensha, 1995). The papers, which consist of evidence of collection of research from many countries and resources, show great variety of the usefulness of traditional knowledge for improving sustainable futures.

Due to a very good fit between material artefacts and the environment, cultural values and beliefs, and ways of life, traditional cultures can be excellent models for practicing living in more sustainable ways (Walker, 2006). Various studies have confirmed many traditional practices and artefacts often reflect a harmonious balance between aesthetics and function, and physical and ideological purposes, integrated with economic and ecological concerns. Different studies on TK systems (Berkes, Colding and Folke, 2000; UNESCO, 2003; Nugraha, 2005; Nelson and Shilling, 2018) have also shown that traditional and indigenous knowledge, practices and artefacts that have been inherited from one generation to another, have excellent quality in use and design; many of them are even still in use today and also have potential to make relevant to modern day life practices for example the stone made mortar and pestle is still in use since the stone age with minimal changes in its design.

The increasing awareness of valuable traditional practices has also stimulated the United Nations Development Programme (UNDP) in 2001 to publish volumes of books concerning practices from different disciplines, such as economic, environment, agriculture, medicine, social policy, and appropriate technology. These volumes present the wide range of successful innovation projects that are based on local traditional knowledge in developing countries in Asia, Latin America and Africa. Emphasising sustainability, they promote local solutions, make use of local materials and knowledge, meaning and rituals situated within them, are innovative in meeting social needs, and can improve the livelihood of the community in holistic way (UNDP, 2001).

Meanings and values

In modern times, as Albio Nascimento (2009) argues, people often lose the natural sense for matter as well as their inherent awareness of the environment. Modern people are now longing for more sensitive and down-to-earth experiences. In Nascimento's view, many industrial products lack the social engagement, the cultural recognition, and the 'human touch', which is not the case in most traditional objects and crafts that stand for authenticity, skill, and tradition; the things we naturally rely on (Nascimento, 2009). Designers often forgot that, besides being economical and functioning well, people also require meaning and tradition (Metcalf, 2007). According to Metcalf, "Modernism's fault was to demand an entirely new world, filled with new art, architecture, and mass-produced design based on formalism and functionalism, while arrogantly ignoring the human need for rootedness" Both Nascimento and Metcalf believe that any object or product that has a continuing link with tradition, could better reconnect people with the material world in a more truthful and honest way.

More than two thousand years ago, the Chinese philosopher Lao Zi believed that humans are the ones that must follow and adapt themselves to nature, not the reverse (Wang, 2009). One could say that this old teaching of Lao Zi is one of the valuable ancient treasures that teach us to respect nature and take various phenomena in nature as valuable lessons for human lives. Comparably, there are many traditional teachings that urge the importance of living in harmony with nature, and that strongly warn not to destroy it. Some studies have shown that the majority of indigenous and traditional practices tend to function and suit with nature's order. Cultures that depend directly on hunting, gathering, and fishing, as Janine Benyus (2002) notes, tend to work out codes of behaviour that honour both product and source. For example, to kill more animals than one needs, or to waste any part of an animal is considered a taboo. Brian Sentance (2001), in his book *Basketry*, illustrates how traditional basket-makers are true

conservationists. Sentance explains that if the basket makers are to be sure of a supply of materials to ply their craft, they have to take only what they need, and only what the plant can spare (Sentance, 2001). When the Maori people need leaves called 'harakeke'(phormium), they never cut the ones in the centre because this is the growing part of the plant that will continue to provide their upcoming needs. Similarly, many traditional communities not only treat their environment with good respect but also regard them as spiritual entities that need to be nurtured and placated. Comparable to what Beyuns explains, collection materials and making baskets often related to prayer, ritual and taboo (Benyus, 2002).

Know-how

Through tradition, people and groups define themselves, conform to society's shared values, and contribute to society. Thus, tradition includes many societal aspects: language, customs, values, norms, morals, rules, tools, technologies, products, organizations, and institutions (O'Donnell *et al.*, 2016). A fundamental attribute of traditional knowledge is that it is place based (Walker *et al.*, 2018); therefore, the values tied to much of the knowledge are also place specific. However, traditional people also share commonalities in their traditional ways of understanding how to live. The term 'know-how' is used to describe the process of developing understandings in Traditional Knowledge (Walker *et al.*, 2018). The term means to live a holistic life in one's community and in nature, which includes the "action of living in harmony with the natural environment for the sake of the community's survival"(Aikenhead and Michell, 2011). 'Know-how' reflects the idea that understanding is a life-long journey, or process, or quest for knowledge, or wisdom (Cajete, 2000).

The relational attribute

Learning, from a traditional perspective, is an experience that seeks balance in an individual's mental, spiritual, emotional, and physical ways. The importance placed on life-long, balanced, and experiential learning in traditional cultures influences what is valued by societies to live a meaningful life. Traditional wisdom is intimately related to human action based on natural laws. Some have described this as the relational attribute of traditional Knowledge (Aikenhead and Michell, 2011), where everything in nature, including humans, enjoys equal status and humility is a cherished value. The relational attribute of traditional Knowledge also includes the value of respect. In addition to values associated with the relational attribute, the values inherent in traditional knowledge have been described in terms of competencies that reflect an ability to survive in a real world context (Barnhardt and Oscar Kawagley, 2005). This wisdom can be both abstract and concrete, but the important characteristics are that it comes from experiences or

truth gained from life. The wisdom from real experiences integrates the body, the spirit and the environment. It emphasizes respect for elders and their life experiences. Moreover, it values morals more than material things (Douglas Nakashima and Marie Rou, 2002).

In recent years, the increasing awareness of the sustainable qualities in traditional ways of living as well as the deterioration of the conditions of the planet have impacted even more the field of traditional knowledge studies (Agrawal, 2002). Traditional knowledge has been therefore used increasingly to “remedy for many of the problems (caused) by development strategies during the past decades” (Agrawal, 1995).

2.5.1 Traditional craftsmanship: embodying ecological ethos and harmonious coexistence with nature

Traditional craftsmanship epitomizes an ecological ethos, symbolizing the harmonious coexistence between humans and nature. This cultural practice, deeply rooted in generations of knowledge and skill, represents not only the aesthetic and material culture but also the sustainable and symbiotic relationship between artisans and their natural environment (Hick, 2004; Vyas, 2012b; Walker, Evans and Mullagh, 2019b). The 2003 Convention on the Safeguarding of Intangible Cultural Heritage emphasizes the importance of preserving the skills and knowledge of craftsmanship rather than the craft products themselves. Safeguarding efforts should thus aim to encourage artisans to continue their work and pass on their expertise to others, particularly within their own communities (UNESCO, 2022). Legal measures, including intellectual property protections and patents, can help communities benefit from their traditional knowledge and crafts (UNESCO, 2022).

Traditional craftsmanship manifests in numerous forms, including tools, clothing, jewellery, festival costumes, storage containers, decorative art, musical instruments, household utensils, and toys (Walker, Evans and Mullagh, 2019b). These objects are often made using locally sourced natural materials, demonstrating a deep understanding and respect for the environment. The skills required to create these objects are as diverse as the objects themselves, from delicate tasks like producing paper votives to robust work such as crafting sturdy baskets or blankets (Rennstam and Paulsson, 2024). This variety illustrates a profound connection with the natural resources available in different regions and reflects an intimate knowledge of sustainable harvesting and use (Payyappallimana and Koike, 2010)

Traditionally, handmade objects were made in communities to meet everyday needs, encompassing not only utilitarian goods but also objects representing beliefs, values, culture,

and identity, as well as artefacts for communal activities such as festivals and religious services. These making practices were often localized and place-specific in their techniques and designs (Kashima, 2020). Their decline has resulted in a significant loss of knowledge, expertise, and tradition (Reubens, 2019).

Despite its intrinsic value, traditional craftsmanship faces significant challenges in the modern era. Globalization introduces mass production, which supplies goods at a lower cost and faster rate than handmade products, creating intense competition for traditional artisans (Zhang, 2022). This shift results in a dominant culture of mass production and fully automated manufacturing, a place-less, consumption-based economic system (de Zoysa and Appadurai, 1998). Environmental and climatic pressures, such as deforestation and land clearing, threaten the availability of essential natural resources (Beck, 2008). Social changes and evolving cultural tastes also reduce opportunities for artisans to practice their crafts, with younger generations often opting for less demanding and more lucrative employment in other sectors (Howe & Dillon, 2001). To address these challenges, safeguarding traditional craftsmanship aims to ensure that knowledge and skills are passed on to future generations, allowing crafts to continue to be produced within their communities. This not only provides livelihoods for artisans but also sustains the cultural and ecological knowledge embedded in their practices (UNESCO, 2022).

Craftsmanship plays a crucial role in preserving and transmitting traditional knowledge and skills. It serves as a tangible expression of local identities and values, reflecting the natural resources, techniques, and artistic sensibilities unique to each region (Zhang, 2022). Through craftsmanship, individuals engage with their cultural roots, contributing to the continuity of traditional ways of life. This engagement fosters a holistic way of life, integrating crafted items into daily living, rituals, and communal activities, thereby promoting a sense of belonging and spiritual fulfilment (Walker *et al.*, 2018).

Economically, craftsmanship supports micro, small, and medium enterprises (MSMEs) that sustain livelihoods by utilizing local resources and skills (UNESCO Institute for Statistics, 2009; Luckman, 2018). Localized production not only meets consumer demands but also bolsters community resilience and economic diversity. Craftsmanship becomes a means of production that preserves heritage and fosters social cohesion (Bin Mohamad, 2021).

In many traditional cultures, the world is perceived as an inclusive, unified whole, without rigid distinctions between utilitarian, decorative, or ceremonial artefacts (Walker, Evans and Mullagh, 2019b). This holistic view contrasts with the Western tendency towards categorization

and simplification (Bin Mohamad, 2021). Recognizing the fluid and dynamic nature of traditional practices, we see their artefacts as a blend of functional, sacred, and aesthetic elements, akin to contemporary product design's integration of these dimensions (de Zoysa and Appadurai, 1998). Traditional artefacts can be categorized into utilitarian, symbolic, and aesthetic, though these categories often overlap. Utilitarian artefacts, such as baskets, textiles, pottery, and furniture, are plain and functional, evolved over generations to meet local needs (Härkönen, Huhmarniemi and Jokela, 2018). Symbolic artefacts, like religious icons, prayer beads, and festival items, hold personal and communal meanings beyond their practical use (Holm, 2015; Steele, 1994). Aesthetic artefacts, including embroidery, ceramic painting, and objets d'art, offer personal and social meanings through their creation and appreciation (Walker *et al.*, 2018).

2.5.1.1 Revitalisation by design

Design has the potential to play a significant role in revitalizing culturally significant products and traditional crafts. Numerous scholars have proposed strategies for achieving sustainability through the revitalization of culturally significant products and traditional crafts (Nugraha, 2010; Soini and Dessein, 2016; Twigger-Holroyd, 2018; Walker *et al.*, 2018; Mullagh, Walker and Evans, 2019; Reubens, 2019; Choudhary and Mishra, 2022). As discussed in sections 2.1.2 and 2.1.3, in the 1990s, concepts such as eco-design and green product design emerged as strategies to reduce the environmental impact associated with production processes (Brezet and van Hemel, 1997; Fraunhofer IZM, 2005; Bhamra and Lofthouse, 2007; Clark *et al.*, 2009; Bhamra, Hernandez and Mawle, 2017). However, Tung (2012) argued that technological innovation often renders traditional craft unsustainable due to the availability of various technological applications that produce a wide range of products, designs, and styles at lower prices. Clark *et al.* (2009) added that sustainable design and innovation are not necessarily about new technologies but about rethinking how to meet the need for growth while reducing negative environmental and social impacts.

Twigger-Holroyd (2018) describes revitalisation as actions that initiate, develop, and sustain domestic practices to protect or enhance values connected with culturally significant designs, products, or practices. Nugraha (2019) emphasizes that revitalisation focuses on restoring long-forgotten customs and traditions and ensuring their future in modern society. Chudasri *et al.* (2012) and Muchtar *et al.* (2020) suggest that revitalising cultural products and processes involves re-examining traditional items, patterns, and methods and infusing new energy into them to modernize and utilize them in new ways.

Walker et al. (2018) gather a diverse set of contributions from global authors and academics that describe numerous methods to assist positive development and long-term change in material culture. They highlight the significance and value of culturally meaningful products, design, and practices relevant to modern culture. Evans et al. (2018, p. 341-359) present five clusters of strategies that highlight how contemporary design can support successful revitalisation, along with three enabling factors that support how design can sustainably reconnect traditions, values, and beliefs with modern ways of living.

The revitalization clusters identified are:

- *Sustain Through Design*: Combining traditional making or use practices with new or reimagined designs.
- *Transpose Tradition*: Taking traditional designs or making practices into a new context.
- *Value of Place*: Foregrounding the value of place and provenance.
- *Production Process*: Employing appropriate and effective methods of making.
- *Skills*: Employing targeted approaches to embed and enhance skills.

These enabling factors are structured around three themes:

1. *Promotion*: Spreading awareness and appreciation through effective promotion.
2. *Enterprise*: Using effective business, organizational, and financial models.
3. *Research and Education*: Learning about traditions, meanings, and contemporary relevance.

Twigger-Holroyd et al. (2015) propose domestication as one viable method for revitalization, identifying six domestication strategies that require unique sets of design activities tailored to specific revitalization projects. These include knowledge exchange, degree of experimentation, and documented, interactive, and live strategies. Domestication, however, often emphasizes moving craft practices away from commercial contexts, focusing instead on their integration into domestic or localized environments. While this perspective fosters personal connections and cultural preservation, the approach taken in this thesis highlights the necessity of commercial frameworks to sustain crafts economically and scale their impact. This stance acknowledges the tensions between commercial and domestic contexts but argues for a balanced integration to ensure craft viability in contemporary markets.

Few researchers in Asia investigate the role of design in the revitalisation of traditional crafts. Chudasri et al. (2020) present findings on the weaving and textile industry in northern Thailand,

highlighting how creative design can ensure the survival of weaving communities and textile goods manufacturing consistent with sustainability principles. Wan Isa et al. (2019) develop a knowledge base for the digital preservation of cultural heritage in Malaysia, stating that digital forms of craft knowledge ensure its accessibility for future generations. The digital world has enabled e-commerce through well-designed e-marketplace solutions (Martins *et al.*, 2020) and new types of digital manufacturing, making it a powerful instrument for craft sustainability (Tung, 2012). Cox (Cox, 2018) argues that machines, regardless of autonomy, require the same level of expertise and cognitive process as any hand tool. For example, CNC manufacturing and 3D printing are considered designer-maker tools (KPMG, 2016; Trussler, Sharp and Beckett, 2016; Cox, 2018). In Scotland, Halbert (2018) examines the revitalisation of knitting as a viable and profitable business activity, supported by new generations, appreciation, and understanding of values. The new generation is ambitious, with increased appreciation for artisan knowledge, skills, heritage, and tradition, alongside a better understanding of economic, social, and cultural values (Halbert, 2018).

While the preceding discussion highlights global strategies for the revitalization and sustainable integration of traditional crafts, the specific strategies employed in India are discussed in section 2.1.5.2. Given the vastness and diversity of the handicraft sector in India, encompassing myriad forms, materials, and cultural contexts, I discuss a brief overview in the same section. India's approach to revitalizing crafts is deeply intertwined with efforts to sustain livelihoods, preserve cultural heritage, and integrate traditional practices with modern market demands. This holistic approach not only seeks to protect and promote the rich legacy of Indian craftsmanship but also aims to ensure its relevance and economic viability in contemporary society. The section 2.1.5.2 and subsequent sections will delve into these strategies in greater detail, exploring initiatives, policies, and case studies that exemplify India's unique approach to sustaining its craft heritage.

2.6 Design and sustainability from the Indian perspective

To clarify, throughout this thesis, the terms craft and handicraft are used interchangeably to refer to the practice of creating handmade objects, often imbued with cultural, artistic, and traditional significance. This distinction ensures consistency in terminology as we explore various perspectives on design and sustainability in the Indian context.

The traditional Indian conception of life is embodied in a coherent worldview in which all its aspects exist in a state of inter-related harmony, being governed by a universal order that is reflected in all realms of human experience. The human being is part of a well-ordered system

in which all aspects of life and nature have their place, and are not in opposition, but in harmony with each other. This harmony between humans and nature is integral to the Indian tradition and ethos (WWF-India, 2015).

At 2015 United Nations Climate Change Conference (COP-21), Union Environment Minister Prakash Javadekar said "Technology may bring forth some solutions, but we must ensure that the needs of seven billion people are met on a sustainable basis. Greed and unsustainable lifestyles should have no place in a new world regime to fight climate change and its ill-effects. Therefore, the Paris conference must include a debate on lifestyles, the world must debate seriously about the sustainable lifestyle issue, as only sustainable lifestyle can mitigate the challenge of climate change." The Minister also added that "Indian lifestyle is against such extravagant consumption and the country has an ingrained sense of responsibility where wasteful consumption is abhorred. Lifestyle adopted in developed countries is unsustainable and it will require five Earths to fulfil their lifestyle demands. On the other hand, Indian lifestyle is sustainable where one earth is sufficient. This is not because of poverty but because of Indian value systems". (WWF-India, 2015).

Today, when people throughout the world are perturbed by the degradation of the environment and the disastrous consequences of this, traditional ethics of nature conservation could be looked upon as a source of inspiration and guidance for the future. It is estimated that 65 per cent of Indian population live in rural areas (United Nations Department of Economic and Social Affairs, 2018). Communities close to nature follow a frugal lifestyle which is not based on high consumption (Greendex, 2014).

Many of the skills still practised in India are passed on from one generation to the next in a master-to-disciple tradition. In rural India, to fulfil their basic needs, people are not dependent on high-energy based products, but on organic farming, skilled labour and individual craftsmanship. Many daily use products are hand-made and made from locally available materials (Aruljothi and Ramaswamy, 2014). This decreases dependence on electricity and other sources of power. For example, handlooms are preferred to power-loom, and Khadi or homespun fabric is popular among large number of Indians across class, gender or generations.

The traditional Indian lifestyle has embedded values of frugality, sustainability and does not have the concept of 'waste'. Indian value systems do not encourage us to replicate the same consumer culture that is rampant elsewhere. Even in our day-to-day life, we see how families in India still make younger children wear the clothes worn by older children in the house. This is not because of poverty, but because Indian value systems encourage three 'R's, reduce, recycle

and reuse material goods at home. This has therefore become ingrained in the psyche of Indian people in rural areas (Vyas, 2012a). This sentiment was echoed at India Global Week by Prince Charles, who stated that:

“India has always understood this. Its philosophy and values have emphasised the sustainable way of life and a harmonious relationship between humanity and nature. For example, the yogic principle of ‘*Aparigraha*’ (the virtue of non-possessiveness, non-grasping or non-greediness) encourages us to keep only that which is necessary at a certain stage of life. We could all perhaps learn from such examples of ancient wisdom.” (Gujarat Exclusive, 2020).

2.6.1 Sustainability concerns in Indian Spirituality

The modern holistic methods of ecological sustainability are replicated in many ancient Indian literatures. In ancient Indian literature earth is honoured as mother. In many parts of India, communities have inherited the rich tradition of love and reverence for nature through the ages, religious preaching, traditions and customs played a prominent role in this regard. All Indian religions are great supporters and promoters of environmentalism (Sharma, et al., 2014). They promote such guidelines and principles among common people that ensured an intimate contact and sense of belonging with nature. It comes up in the form of directive principles and orders to the followers of religion, to perform certain rites and rituals that became a part of their life and ensure environmental sustainability (Dhiman, 2016)

In an article on ‘Earth Charter and Hinduism’, Chowdhry emphasized that, “Hindus regard everything about them as pervaded by divine presence. The rivers, mountains, lakes, animals, flora and fauna, are all manifestations of God, and therefore there is a deep respect and gratitude felt towards nature” (Chowdhary, 2005). The whole emphasis of the ancient Indian religious practices is on that human beings cannot be separated from their natural surroundings.

This is evident in the practice of a classical *Bharat Natyam* dancer when she steps on to the stage. Firstly, she touches the floor and with a prayer she asks forgiveness from the Earth as she is going to stamp hard with her feet on the earth while dancing (Chowdhary, 2005).

2.6.2 Handicraft industry in India and design intervention

The handicraft sector is a significant contributor to India’s economy, providing employment to over seven million artisans and contributing substantially to exports (Ministry of Textiles, 2017).

This sector not only supports the rural economy but also plays a crucial role in preserving traditional skills and knowledge. Handicrafts are the second largest source of employment in India after agriculture (Crafts Council of India, 2011).

Globalization has introduced both opportunities and challenges to the Indian handicraft industry. While it has opened up new markets, it has also brought competition from machine-made products and mass consumption (Choudhary and Mishra, 2022). This competition, along with changes in consumer preferences and the demand for contemporary designs, has pressured traditional artisans to innovate while maintaining their craft's authenticity (Jena, 2010).

The commoditization of products due to globalization poses a significant threat to traditional craftsmen, pushing these deep-rooted handmade products out of the market, replacing them with mass-produced, factory-made goods. The inability of the market to recognize the true value of craft leads to lower wages for artisans, despite the high value of their work (Kapur and Mittar, 2014; Majeed, 2018). Consequently, many artisans are forced to move to urban centres in search of low-skilled employment in industries (Crafts Council of India, 2011).

The Indian government has implemented various schemes to support the handicraft sector, such as the Artisan Credit Card Scheme, Export Promotion Schemes, and the creation of craft clusters (Ministry of Textiles, 2017). These initiatives aim to provide financial assistance, improve infrastructure, and promote the global marketing of Indian handicrafts. While these programs have created new opportunities, they have also highlighted the risks of overshadowing traditional craftsmanship with mass production models. Challenges such as inadequate access to credit, lack of modern marketing strategies, and limited technological advancements remain significant obstacles (Jena, 2010), which must be addressed to sustain the sector.

Design interventions are crucial in reviving traditional crafts and making them relevant to contemporary markets. Institutions like the National Institute of Design (NID) and the Crafts Council of India play a pivotal role in skill development, product diversification, and design innovation (DeNicola and DeNicola, 2012). However, these interventions must be carefully balanced to preserve the authenticity of the craft while addressing the market's demands. Design intervention involves redesigning existing products with changes in shape, size, colour, surface manipulation, function, and utility; exploring new markets; and applying traditional skills to meet new opportunities and challenges (Singh, 2017). Yet, such interventions must be

sensitive to the potential consequences of over-modernizing, ensuring that the essence of the craft is not lost in the process.

Case studies of successful interventions

Kala Raksha: An NGO in Gujarat, Kala Raksha focuses on preserving traditional craft skills while integrating contemporary design. The organization provides training in design and marketing, helping artisans create products that appeal to both domestic and international markets (Roy, 2012).

Dastkari Haat Samiti: This initiative organizes craft bazaars and workshops, bringing artisans directly in contact with consumers. It provides a platform for artisans to showcase their work and receive feedback, helping them adapt their products to market needs (Choudhary and Mishra, 2022).

E-commerce and digital platforms: The advent of e-commerce has provided a new avenue for artisans to reach global markets. Platforms like Amazon Karigar and Craftsvilla offer artisans an online marketplace to sell their products directly to consumers. These platforms also provide marketing support and help artisans understand market trends (DeNicola and DeNicola, 2012).

Social enterprises and NGOs: Social enterprises and NGOs have been instrumental in promoting sustainable development within the handicraft sector. Organizations like FabIndia and Rang De have created models that ensure fair wages and ethical practices, thus improving the socio-economic conditions of artisans (Choudhary and Mishra, 2022). According to William Bissel, Managing Director of FabIndia, the number of Indian artisans has decreased by 30% over the past 30 years, indicating the need to reinvest in artisans to safeguard history, culture, and an important source of livelihood (Madan, 2017).

Despite these positive interventions, challenges remain. Artisans often face issues like lack of education, inadequate infrastructure, and limited access to modern technology. Furthermore, balancing traditional aesthetics with contemporary design can be challenging, as excessive modernization may dilute the cultural essence of the crafts (Roy, 2012).

Artisans in India historically served as both creators and designers, deeply attuned to local aesthetics and consumer needs (Madan, 2017). Design interventions today bridge the gap between traditional craftsmanship and modern market demands, ensuring products remain culturally relevant while meeting contemporary consumer expectations (Jain and Thakkar, 2019).

Design interventions aim to enhance marketability while preserving the cultural integrity of crafts (Kapur and Mittar, 2014). However, balancing commercial viability with cultural authenticity remains a delicate challenge, requiring collaboration between designers, artisans, and market forces. Various frameworks exist for effective design interventions, emphasizing understanding of crafts, artisanal processes, and market dynamics (Kapur and Mittar, 2014). These frameworks guide the implementation of interventions that support sustainable economic practices and cultural preservation. Design interventions in India play a pivotal role not only in revitalizing traditional crafts but also in preserving cultural heritage and supporting sustainable livelihoods for artisans.

2.6.2.1 Learnings and opportunities for design

On statistical scales, more than 3000 castes, 432 tribal communities and believers of Hinduism, Islam, Christianity, Sikh, Jain, Buddhism and Zoroastrians have been living together in India for centuries (Cohen, 2004; BBC, 2019). Over 1650 dialects are spoken by the people of India (IGNCA, 2005). This wealth of heritage exhibits the depth of traditional knowledge and skills that are still in practice across India. Its vast diversity in culture has been the genesis for manifestations of all human behaviour; language, customs, rituals, traditions, music, dance, arts and crafts. One of the most visible forms of traditional knowledge and skills is crafts. This cultural richness is home to approximately 7 million artisans that are engaged in the craft industry. However, unofficial estimates place the number much higher, with some sources suggesting that around 200 million people directly or indirectly depend on craft for their livelihood. Additionally, nearly 4,000 traditional handicrafts and handloom clusters employ more than 7 million artisans across India, particularly in rural and remote areas (Gupta and Modi, 2023; Ministry of Textiles Government of India, 2024). These discrepancies highlight the challenges in accurately quantifying the artisan population in India, given the sector's informal and decentralized nature (Kapur and Mittar, 2014). The existence of Indian crafts today proves the efforts put into their preservation by design fields. Contemporary designers are constantly embedding traditional crafts into their designs, see works of following designers, design organisations and design researchers, Anantaya – lifestyle design studio selling craft based contemporary products; Studio Coppre – design studio selling craft based contemporary home and living products; Rahul Mishra – a fashion designer designing luxury, pret and haute couture garments with traditional textiles and techniques; Sangaru Design Objects Pvt. Ltd. - a multi-disciplinary design studio making craft-based furniture and products; Gaatha – a non-for-profit design organisation providing e-commerce platform to craftspeople to sell traditional

handicrafts and share the culture behind them; Ekibeki – a hybrid design organisation of for-profit and non-profit; Pero – a design firm making contemporary international fashion pieces with traditional textiles and handmade artistry; Raw Mango – a firm designing traditional handloom pieces with innovation and cultural stories; Varnam Craft Collective – design studio revitalising traditional lacquered wood turning craft. These are just few examples but there are thousands of designer and design firms working with crafts and contemporising them, see also work of design researchers (Liebl and Roy, 2004; Reubens, 2010; Botnick and Raja, 2011; Ranjan, 2011; Craft, 2016; Jain and Thakkar, 2019; Sarin, 2022).

Many efforts have been put into various craft clusters from government, policy makers, designers to preserve and revive the crafts and sustain livelihoods of artisans. Also, there is a complete educational institute, Indian Institute of Crafts and Design (IICD) in Jaipur, Rajasthan, which mainly educates for the crafts and their existence with design. Despite these efforts, the roots of these crafts, which are the rural craftspeople, are in decline (Yang *et al.*, 2018).

National policy makers claim that design is a key intervention for supporting crafts peoples' livelihoods for sustainable future (Folisi, Rosso and Manuela, 2024). Designers are the bridge between artisans and contemporary markets. Most of the craft clusters are situated in rural villages and closely connected to local cultures and traditions. While traditional practices which depend on handmaking directly or indirectly are still prominent in Indian villages, they are not recognised as a craft cluster or artisans and they do not get any policy support from government like other craft sectors and clusters get in India. Many of these practices are not mentioned in any literature, neither they are documented like other craft., Designers and scholars are not advocating and intervening them for their notable sustainable qualities for holistic and meaningful future. The examples mentioned in following sections comes from my personal experiences of growing up in India and as a designer working with craft sector and artisans from various regions for more than four years.

2.6.2.2 Existing examples of what and how design can learn from traditional knowledge and practices:

1. Biodegradable sanitary pads made of banana fibers

In ancient India women used to use banana leaves during menstruation cycle because they are large, flexible, and waterproof. Taking inspiration from there MIT graduates have designed sanitary pads made of banana fibres (Saathi Pads, 2024).



Figure 3. Banana fibre pads (TNM, 2018) & Saathi Pads (Saathi Pads, 2015)

2. Edible cutlery

Designers at Bakey's (Micu, 2016) have developed edible cutlery to provide an effective alternative to plastic disposable cutlery. Designers took inspiration from traditional dish called 'Khakra' which is very much like poppadams. This cutlery can be used to consume hot and cold food and the cutlery can be eaten after use.



Figure 4. Bakey's logo (Ven, 2015), Khakra' traditional dish (TNN, 2004), Edible cutlery (Garfield, 2015)

3. Zero-energy terracotta refrigerator

Mansukhbhai Prajapati took inspiration from terracotta water storage which is a very common household product to store and keep water cold during summer. Taking inspiration from there, the designer has designed a zero-energy terracotta refrigerator with water tank at upper level which keeps vegetables and fruits in the below levels fresh for 3-4 days (Mitticool, 2017).



Figure 5. Terracotta water storage (TimesFood, 2018) & zero-energy terracotta refrigerator (Universal Design Aviation Lab, 2014)

4. Grass curtains to keep interiors cool

In many parts of India indigenous communities use this medicinal grass for various purposes because of its naturally coolant properties. Designers used the same grass to design curtains which can be hung on windows and balconies to keep indoors cooler during the summers (Khus Store, no date).



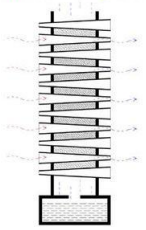
Figure 6. Indigenous people working with 'Khus grass' (Mohan, 2012) & grass curtains (Humairah, 2011)

5. An air conditioner that runs without electricity

Ant Studio designed a sculptural installation that is capable of cooling the air by passing small streams of water through it. They also took the inspiration from terracotta water storage. Porous clay absorbs liquid, and as it slowly evaporates, the temperature of the air passing through these tubes decreases by 6-10 degrees (Cool Ant Studio, 2023).



Hot air → Cool air



TECHNIQUE
Hot air from the generator is passed through a series of terracotta cones stacked as shown in the adjacent sketch. Recycled water from the factory is run on top of this pots to achieve evaporative cooling. Sand is filled in between the pots to hold the water in it. This reduces the usage of excessive water and electricity.

CFD Analysis:

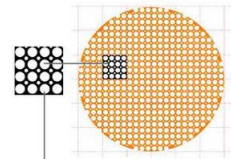
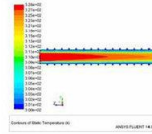
The inlet air is at 55 degrees C with 600 m/min air velocity

The air flow across the 100 mm dia tubes are assumed to be same, i.e. each tube will have 4 m/sec inlet air flow

Thickness of the terracotta tube is considered as 15 mm.

Assuming terracotta pipes are kept wetted with water always. The water temperature considered for analysis is 27°C.

The minimum temperature or cooling air temperature will be 35°C for 1000 mm tube length



STACKING
The form of the air cooling system looks like Beehive of earth. Pots are stacked in a disc like structure.



DEKI Electronics
AIR COOLING SYSTEM, NOIDA

CLIENT: HR, VINOD SHARMA
ORGANISATION:
URBANBOX DESIGN STUDIO

PRINCIPAL ARCHITECT / AUTHOR:

PROJECT TEAM:
ABHISHEK SUNAR
ATUL SENSHAR

CFD ANALYSIS: PR. S. A. MALIK

BRIEF:
The generator near the main entrance of the factory is causing high levels of increase in the temperature of the area, great discomfort and reduce in the performance of the genset. Client wanted us to address this issue with design we suggested this system that cools the hot air released with minimum energy using traditional means using recycled water from the factory.



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Figure 7. Terracotta low-tech air-conditioner (Ant Studio, 2017).

2.7 Discussion and Conclusions

This chapter has addressed the first two research objectives:

- 1: To develop a critical understanding of modern approaches to Design for Sustainability.
2. To consider the relationship between traditional knowledge, sustainability and design, with a focus on the Indian context.

The literature review indicates that sustainability is growing in importance and that designers can make significant contributions towards developing more sustainable ways of living. To this end, numerous sustainability approaches and assessment systems have been developed to support designers. Despite this, interest in sustainability and sustainable design has been slow to gain traction and be translated into frequent practice by designers in either developed (Mate, 2006; Kang, Kang and Barnes, 2008; Kang and Guerin, 2009) or developing countries (Hankinson and Breytenbach, 2013). While there is a paucity of literature on the percentage of design practitioners who use sustainable design strategies and approaches (Bhamra, Hernandez and Mawle, 2013), there are several studies which focus on the barriers to sustainable design. These studies indicate that there is a gap between current sustainability-design practices and their potential.

- Based on the literature review, several inadequacies in existing sustainability approaches have been highlighted, which are summarised accordingly Limited scope of existing approaches: many sustainability frameworks focus primarily on ecological aspects (e.g., Cradle-to-Cradle, Biomimicry, Circular Economy), neglecting social, cultural, and personal dimensions (Bjørn and Strandesen, 2011; Walker, 2014a).
- Neglect of social and cultural factors: approaches like Cradle-to-Cradle and Circular Economy emphasize technical and economic aspects while underplaying social and cultural dimensions (Shedroff, 2009; Bjørn and Strandesen, 2011).
- Inadequate consideration of human values: existing frameworks often prioritize economic and environmental factors over personal and social meaning, which are crucial for long-term sustainability (Walker, 2014a; Elkington, 2018).
- Gaps in addressing inner values: the emphasis on economic metrics and technical efficiency often disregards the deeper human values and spiritual dimensions that contribute to a meaningful and sustainable life (Walker, 2014a).

These inadequacies collectively suggest the need for alternate, more holistic approaches such as Walker's Quadruple Bottom Line (QBL) as this framework expands the traditional Triple Bottom Line (TBL) to include personal meaning alongside economic, social, and environmental considerations. The QBL enables a more holistic and meaningful approach in the following ways:

- Integration of inner values: by placing personal meaning on an equal footing with economic, social, and environmental considerations, the QBL acknowledges the importance of spirituality, ethics, and personal growth in sustainable design (Walker, 2014a).
- Cultural relevance: QBL recognizes the significance of cultural values and traditions, suggesting that sustainable solutions should resonate with local cultures and practices (Walker, 2011b).
- Comprehensive sustainability: unlike other frameworks that focus narrowly on technical or economic solutions, QBL encourages a balanced approach that includes human well-being and spiritual fulfillment as integral to sustainable development (Walker, Evans and Mullagh, 2019a).
- Long-term perspective: QBL supports designs that promote longevity, continuity, and deeper connections, contrasting with the consumer-driven models that prioritize novelty and rapid turnover (Walker, 2014a).

As design for sustainability frameworks continue to evolve, cutting-edge approaches are emerging to address the limitations of traditional models. These include:

Pluriversal and decolonial design: This approach advocates for sustainability practices that are inclusive of diverse knowledge systems and challenge the historical biases in mainstream sustainability models. By incorporating indigenous and non-Western knowledge, this field stresses that sustainability cannot be universally standardized but must respect and integrate diverse cultural values. This aligns with Walker's call for integrating personal meaning and cultural relevance into design (Escobar, 2018).

More-than-Human design: Expanding the focus from human-centered design, these frameworks consider the well-being of non-human life and ecosystems. They emphasize interconnectedness, urging designers to consider the broader ecological web in which human activities occur (Giaccardi and Redström, 2020; Stead and Coulton, 2022a). These fields challenge the anthropocentric assumptions of traditional sustainability frameworks and offer new ways of designing with a holistic view of all life forms.

Regenerative design: A critique from Ehrenfeld (2008) points out that traditional approaches like eco-efficiency and the Triple Bottom Line focus on reducing harm rather than fostering regeneration. Regenerative design goes beyond sustainability by aiming to restore and renew ecosystems, communities, and economies. This approach advocates for designs that regenerate and heal, rather than simply minimizing damage, and aligns with QBL's long-term, holistic view of sustainability (Gibbons, 2020).

These emerging frameworks extend the concept of sustainability by incorporating broader ecological, social, and cultural perspectives. They provide valuable insights into addressing sustainability from a multidimensional standpoint, reinforcing the need for integrated approaches in design.

In summary, the QBL provides a framework that addresses the shortcomings of existing sustainability approaches by advocating for a more comprehensive integration of economic, social, environmental, and personal dimensions. It recognizes the importance of inner values, cultural contexts, and long-term sustainability in designing solutions that are meaningful and impactful. This holistic approach is essential for achieving sustainable development that enhances human well-being and respects the planet's ecological limits.

Additionally, the literature review around tradition (section 2.1.4) and sustainability from the Indian perspective (section 2.1.5) highlights the potential of traditional knowledge and practices for a holistic and meaningful sustainable future. Existing methods often fail to integrate the rich, context-specific knowledge embedded in traditional crafts, which emphasize the interconnectedness of humans and nature, sustainable resource management, and cultural values. Efforts to preserve and revive traditional crafts have been made, but they are insufficient without a deeper integration of traditional knowledge. While current efforts focus on preserving, reviving, and revitalizing traditional crafts to sustain them and their associated livelihoods, there is a need for a paradigm shift in design. Rather than merely supporting crafts for their sustainability, design should adopt traditional and culturally significant ways of making and living to sustain design, humans, and the planet at large.

This tension between the traditional and modern worlds is significant and needs to be addressed within the context of sustainable design. Traditional knowledge is often marginalized in favour of Western paradigms of progress and development, leading to a disconnection between the two. As Berkes, Colding, and Folke (2000) highlight, there is a constant tension between these two worlds, with modernity often overpowering traditional practices, further exacerbating challenges related to sustainability. This dynamic creates an environment where

traditional practices are undervalued or seen as backward, despite their inherent sustainability principles. This tension underscores the importance of not merely looking at traditional crafts through a preservationist lens, but rather recontextualizing them within a modern sustainability framework. In doing so, it becomes crucial to find ways of bridging these two worlds, acknowledging the valuable insights each provides.

Examples such as biodegradable sanitary pads, edible cutlery, and zero-energy terracotta refrigerators demonstrate how traditional practices can inspire innovative and sustainable solutions. A holistic approach to sustainability must respect and incorporate learnings from traditional knowledge, ensuring the preservation of cultural heritage while addressing contemporary challenges. This integrated strategy offers more effective and contextually relevant solutions, promoting an equitable and resilient future that honours the intricate balance between humans and nature. The table below summarises the key findings from these sections:

Table 2 Key findings from literature

Inadequacies of existing sustainability approaches	Globalization and mass production pressures lead to the decline of traditional craftsmanship.
	Technological advancements often overshadow traditional crafts.
	Environmental degradation and economic pressures threaten the sustainability of traditional practices.
	Social and cultural shifts reduce the relevance of traditional crafts.
Potential of traditional knowledge and practices	India has a rich diversity of traditional knowledge and skills, especially in crafts.
	Efforts to preserve and integrate traditional crafts into modern products are ongoing but need more support.
	Examples of successful integration include biodegradable sanitary pads, edible cutlery, zero-energy terracotta refrigerators, grass curtains, and non-electric air conditioners.
Holistic and meaningful approach	Traditional knowledge systems emphasize interconnectedness, flexibility, and adaptability.
	Ethical integration of traditional knowledge into modern practices is necessary.
	Traditional practices offer resilience, context-specific solutions, and sustainable resource management.
	A holistic approach must incorporate traditional knowledge to foster a sustainable future that honours cultural heritage and ecological balance.

Overall, to address sustainability holistically, the ecological, cultural, social and personal tenets need to be considered. The literature analysis revealed that, while all the approaches and assessment systems prioritized the economic and ecological aspects of sustainability, none of

them looked at sustainability in a holistic manner. However, the fact that the newer and hybridized frameworks (including design for sustainability, life-cycle assessment) increasingly recognize and attempt to address multiple factors, while retaining their economic and ecological precedence, seems to confirm the need for more holistic approaches to sustainability. A significant issue with many existing approaches remains their emphasis on economy-driven growth and modern consumption values. However, some approaches, such as Transition Design, Decolonial Design and Pluriversal Design, etc., explicitly critique these paradigms by advocating systemic change, regenerative practices, and long-term resilience. The QBL goes further by “asking us to consider the spiritual impacts of our productions, to consider issues such as sufficiency, our use of products and their potential effects on wellbeing. It asks us to consider the importance of providing useful and fulfilling human work, and its relation to human dignity, family cohesion, and community; which contrasts markedly from current models that seek to constantly eliminate jobs and adopt automated processes to maximize profits” (Walker, 2014d). At the same time, existing efforts towards sustainable development looks at approaches for more sustainability or reducing unsustainability. According to Ehrenfeld (2008), reducing unsustainability will not create sustainability, “Sustainability and unsustainability are not just two sides of the same coin or parts of the Zen glass contents. Our modern culture has led us to the wrong place by reifying sustainability” (Ehrenfeld, 2008). For Ehrenfeld, the main problem with modern approaches is that we are trying to solve the problems with similar kinds of thinking that created them. Moreover, approaches like ecoefficiency, Natural Capital, The Natural Step, Triple Bottom Line, and many others are “part of the problem, not the solution: they all will fail sooner or later and, worse, shift the burden away from more fundamental actions” (Ehrenfeld, 2008).

In contrast to this, traditional knowledge and practices are developed through generations “[taking] account of a wider complex of human values, tastes, attitudes, social and cultural norms and patterns of consumption to theorize dynamic relationships between people, place, resources, techniques, and processes of making” (Evans, 2018). At the same time, the literature review around tradition and traditional practices in India also revealed that the bodies of traditional knowledge and practices contain systematic interconnections between sociocultural, environmental, spiritual phenomena and value system, beliefs, and practical knowledge. Thus, these practices have more meaningful perspectives to offer while designing for a sustainable future.

2.7.1 Identifying the gap in the literature

The literature review identifies a significant gap between current Design for Sustainability approaches and the potential embedded in traditional Indian products and practices to contribute to such approaches. This gap stems from several critical observations:

- **Limited scope of existing approaches:** many current sustainability frameworks such as Cradle-to-Cradle and the Circular Economy predominantly focus on environmental and economic aspects, often overlooking or downplaying the social, cultural, and personal dimensions that are crucial for holistic sustainability.
- **Gaps in addressing inner values:** the emphasis on measurable outcomes often disregards the subjective aspects of sustainability, such as personal well-being, spiritual values and cultural significance.
- **Underutilization of traditional knowledge:** despite the rich cultural heritage and diverse traditional knowledge systems worldwide, modern sustainability approaches often overlook or undervalue these practices. Traditional knowledge frequently encompasses centuries-old wisdom on sustainable resource management, ecological balance, cultural integration, rituals, religious practices, and spiritual values, all of which are crucial for addressing contemporary environmental challenges.
- **Inadequate integration of traditional knowledge into contemporary design:** while there are efforts to preserve and revive traditional crafts, the integration of traditional knowledge into contemporary design for sustainability remains limited. Modern design practices often prioritize technological innovations and globalized approaches, sidelining locally embedded knowledge and sustainable practices inherent in traditional Indian products and practices.
- **Cultural and contextual specificity:** traditional products and practices are deeply rooted in local cultures, climates, and resources, providing context-specific solutions tailored to local environmental conditions and societal needs. However, these localized aspects are often not fully recognized or incorporated into broader sustainability frameworks, which tend to favour standardized, one-size-fits-all solutions.

2.7.2 Research question derived from the gap

As the literature review has revealed a significant gap regarding the relationship between everyday Indian traditional products and practices and their potential to inform more holistic Design for Sustainability approaches in product design, the overarching research question for

this study is: ***What can Design for Sustainability learn from traditional Indian products and practices?***

While traditional Indian products and practices embody deep-rooted sustainability principles and cultural significance, their integration into contemporary design approaches for sustainability remains under-explored. Specifically, there is a need to bridge this gap by examining how traditional Indian products and practices manage sustainable resource use, adapt to environmental changes, and maintain harmonious relationships with nature. Understanding these traditional sustainability principles and evaluating their potential adaptation and integration into modern design processes may lead to more context-specific, culturally meaningful, and holistic sustainable solutions.

To address the research question, this study outlines the following objectives:

1. To develop a critical understanding of modern approaches to Design for Sustainability.

This objective establishes a foundation for evaluating current sustainability practices, identifying gaps, and highlighting opportunities for improvement through the integration of traditional knowledge.

2. To consider the relationship between traditional knowledge, sustainability, and design, with a focus on the Indian context.

Exploring the cultural and ecological dimensions of traditional Indian practices will help uncover their potential relevance and value in addressing contemporary sustainability challenges.

3. To identify and document traditional Indian products and practices that are still relevant to contemporary lifestyles through autoethnographic case studies.

This objective ensures a deep, context-specific exploration of traditional products and practices that continue to resonate in modern settings.

4. To conduct a detailed analysis of selected traditional Indian products and practices to evaluate their alignment with sustainability principles.

This includes examining materials, production methods, lifecycles and products involvement in everyday life, alongside comparative studies with modern equivalents, to identify specific sustainability features.

5. To conduct interviews with contemporary design professionals in India.

Engaging with practitioners will provide insights into their perspectives, motivations, and challenges in integrating traditional crafts and practices into modern sustainable design.

6. To develop a comprehensive framework for designing holistic and meaningful products.

Synthesizing insights from the study, this framework will guide the creation of products that embody sustainable principles while respecting cultural heritage.

7. To design a contemporary everyday product incorporating insights from traditional Indian products and practices and evaluate its compliance with sustainability principles.

This objective aims to validate the proposed framework by demonstrating its practical application and effectiveness in creating sustainable, culturally meaningful designs.

These objectives collectively aim to bridge the identified gap by exploring and integrating traditional Indian sustainability principles into contemporary design practices, offering a path toward more inclusive and holistic Design for Sustainability approaches.

Chapter 3 Research Methodology

3 Research Methodology

This chapter presents the research methodology applied in this project. It includes the research types and approaches, research design, data collection methods, data analysis, the validation of the research findings, and ethic approval.

3.1 Introduction

This chapter describes the research methodology used in this research, in order to answer the primary research question; **“What can Design for Sustainability learn from traditional Indian products and practices?”**. The chapter includes a discussion about research types and approaches, data collection methods, data analysis, the validation of the research findings, and ethics approval.

This methodology chapter is organized into subsections, each addressing key aspects of the research process. Section 3.1.1 outlines the philosophical framework, grounding the research in constructivist ontology and interpretivist epistemology. Section 3.1.2 explores types and approaches in design research, tracing its evolution from dialectic and design science to reflective practices influenced by figures like Buchanan, Cross, and Schön. Section 3.1.2.2 categorizes design research into 'on', 'in', and 'through' design, demonstrating how each approach contributes theoretical insights, practical applications, and direct design interventions. Section 3.1.4 details the chosen methodology's alignment with constructivist ontology and interpretivist epistemology, and focuses on the case study method for its exploratory and explanatory capabilities. Then, 3.1.4.2 justifies qualitative methods for capturing the complexity and contextuality of traditional products and practices in India and 3.1.4.3 discusses the case study approach's suitability for investigating real-life contexts and phenomena. Section 3.1.5 outlines the overall research phases, from theoretical exploration to synthesis of findings, aligned with the chosen methodologies. Section 3.1.6 describes specific methods such as literature review and autoethnography for gathering insights into cultural contexts and design influences. Section 3.1.7 synthesizes data from autoethnographic narratives and interviews, revealing cultural and contemporary implications. Sections 3.1.8 and 3.1.9 address ethical considerations and research validation, ensuring methodological rigor and credibility throughout the study. Together, these sections provide a robust methodological foundation to generate holistic understandings and actionable insights for sustainable design practices informed by traditional wisdom.

3.2 Research paradigm

A research paradigm is a philosophical framework that particular research is based on. A research paradigm offers a pattern of beliefs and understandings from which the theories and practices of research project operate (Silverman, 2013; Gray, 2014). It consists of ontology, epistemology, and research methodology.



Figure 8 Research Paradigm

Ontology and epistemology are two key components of a research paradigm that shape the researcher's understanding of reality and knowledge (Gray, 2014). They provide a philosophical framework that influences the researcher's approach to research questions, data collection, analysis, and interpretation.

3.2.1 Ontology

Ontology refers to the researcher's beliefs about the nature of reality, existence, and the types of entities or phenomena that exist in the world. It deals with questions about what exists, what can be known, and how reality is structured. Researchers' ontological stance influences how they conceptualize and define the phenomena they study and the assumptions they make about the nature of the world (Gray, 2014; Crotty, Shakespeare and Henry, 2020).

Objectivism/Realism: Objectivism or realism assumes that there is an objective reality that exists independently of human perception. It asserts that there are objective truths and facts that can be discovered through empirical observation and measurement. Researchers adopting an objectivist or realist ontology believe that the world exists independently of human experience and can be studied objectively (Thomas, 2011).

Constructivism/Subjectivism: Constructivism or subjectivism holds that reality is socially constructed and influenced by human perspectives, interpretations, and experiences. It

recognizes the role of human consciousness in shaping knowledge and the understanding that different individuals or groups may construct different meanings and interpretations of reality. Researchers with a constructivist ontology focus on exploring multiple subjective viewpoints and understanding the social and cultural contexts that influence knowledge construction (Gray, 2014; Bryman, 2016).

For this thesis I adopt a constructivism/subjectivism approach. The reason for selecting constructivism is because this approach recognizes the role of human consciousness in shaping knowledge and focus on exploring multiple subjective viewpoints and understanding the social and cultural contexts that influence knowledge construction, which is relevant for the study of traditional Indian products and practices within a particular context.

3.2.2 Epistemology

Epistemology refers to the researcher's beliefs about how knowledge is acquired, validated, and justified. It addresses questions about the nature of knowledge, the criteria for truth, and how knowledge can be obtained (Gray, 2014). Epistemological considerations guide researchers in determining what counts as valid knowledge and the appropriate methods for generating and evaluating that knowledge (Crotty, Shakespeare and Henry, 2020).

Positivism: Positivism adopts an empirical and scientific approach to knowledge. It asserts that knowledge can be obtained through systematic observation, measurement, and the application of scientific methods. Positivist researchers prioritize objectivity, quantifiable data, and the search for general laws or regularities (Gray, 2014).

Interpretivism/Constructivism: Interpretivism or constructivism recognizes the subjective nature of human experiences and the importance of understanding social and cultural contexts. It emphasizes the interpretation of meanings, values, and perspectives of individuals or groups. Interpretivist researchers employ qualitative methods and focus on the understanding of subjective realities and the complexity of human behaviour (Bryman, 2016).

Pragmatism: Pragmatism emphasizes the practical implications of knowledge and the integration of different perspectives and methods. Pragmatic researchers prioritize the usefulness and applicability of knowledge, seeking to address practical problems and generate actionable insights (Gray, 2014).

Since this research aims to investigate "What can Design for Sustainability learn from traditional Indian products and practices?", interpretivism is a suitable research approach for two reasons:

Firstly, interpretivism recognizes that individuals and communities construct meanings and interpretations of their experiences. Traditional Indian products and practices are deeply rooted in cultural and historical contexts, carrying layers of symbolic, aesthetic, and functional meanings. Adopting an interpretive approach allowed me to delve into the subjective perspectives, values, and beliefs associated with these traditions, providing insights into how sustainability can be understood and integrated within the Indian context. And secondly, interpretivism emphasizes the importance of understanding the social and cultural contexts within which phenomena occur. Traditional Indian products and practices are influenced by socio-cultural factors, such as religious beliefs, rituals, social structures, and historical traditions. By adopting an interpretive approach, I can explore the interplay between these contextual factors and the sustainability practices embedded within traditional Indian design, revealing the nuances and complexities of sustainable design within this specific cultural context.

Overall, by adopting an interpretive approach, the research question on Design for Sustainability and traditional Indian products and practices can explore the subjective experiences and meanings, cultural contexts, complex social phenomena and dynamics surrounding sustainability. It allowed me to go beyond surface-level observations and gain a deeper understanding of how traditional Indian products and practices can inform and contribute to sustainable design approaches.

3.3 Types and approaches of Design research

Stolterman (2008) presents and contrasts the types of complexity faced by scientists and designers respectively, stating that scientists confront an incredibly complex world from which they seek to formulate universally generalizable and reproducible knowledge. However, this massive endeavour relies upon on a scientific method which allows scientists to tackle a distinct phenomenon in isolation and also the huge number of collaborators - past, present and future - whose work can be stitched together with their own, since they speak the same fundamental language. In juxtaposition to this, the complexity that designers face is of a different nature: “[...] design deals with the specific, intentional and non-existing [...] the goal is all about creating something non-universal. It is about creating something in the world with a specific purpose, for a specific situation, for a specific client and user, with specific functions and characteristics, and done within a limited time and with limited resources” (Stolterman, 2008, p 59). Stolterman’s line of argument is that research undertaken in order to inform or improve the practice of design has to build upon an understanding of this fundamental complexity; and since

complexity in science and complexity in design are of a different nature, design research may have to formulate and rely upon different methods and approaches than those of science.

The concept of design and design research lacks a universally agreed-upon definition, with numerous and often contradictory definitions emerging over the decades (Saikaly, 2005; Frankel and Racine, 2010). However, certain foundational understandings remain relevant. Simon (1969) characterized design as the transformation of an existing situation into a preferred one, while Cross (2001, 2006) described 'designerly ways of knowing'. Archer (1981) conceptualized design as a 'third order' activity, focusing on the 'making and doing aspects of human activity'. Frankel and Racine (2010) defined design in the context of their review of design research as 'an activity for planning and implementing new products', encompassing the resultant artefacts like drawings, models, plans, and manufactured objects. Comprehensive historical analyses of design research are provided in works by Cross (2001), and Frankel and Racine (2010), building on prior reviews by Archer (1995), Buchanan (2016), Cross (2001), and Frayling (Frayling, 1993).

Design Research has a special, somewhat peculiar place within the paradigm of scientific research. as L. Bruce Archer (1981) defined, 'Design research is systemic inquiry whose goal is knowledge of, or, in, the embodiment of configuration, composition, structure, purpose, value, and meaning in man-made things and systems' (Archer, 1981, p. 31). Additionally, Binder and Brandt (2007) narrow this down by identifying two different uses of the term design research

... design research as a label is used both to point to a particular aspect of professional practice, as reflected for example in publications on how to conduct research in a professional design setting (Laurel, 2003) and as a particular designerly mode of scholarly inquiry often called practice-based research, that accommodates artistically oriented explorations of scholarly themes (Biggs, 2004). The two are not contradictory but indicate an interesting ambiguity: design practice may involve research, and design research may involve design practice, without the present-day discussion giving any formal or practical handles to distinguish between research in the former and the latter case (Brandt and Binder, 2007).

Whereas design research in the first definition of the term implies questions and concerns regarding research methodology, the second definition, in which designers are themselves employing design as a mode of inquiry, poses challenges regarding both design practice and research practice. In exploring the relationship between design and research, Fallman (Fällman, 2007) offers a distinction between research-oriented design and design-oriented research,

which is related to, although not entirely analogous with, the distinction made by Brandt and Binder (2007). Research-oriented design denotes a design situation in which research is employed as a means of generating insights that will feed into the design of a product: “While research-oriented design may relate to, seek influence in, and even contribute to research (i.e. the generation of knowledge) in different ways, it has the production of new artefacts as its main motivation and goal.” (Fällman, 2007, p. 4). Design-oriented research, on the other hand, denotes a research situation in which design serves as a means for generating insights and knowledge for use in research: “In design-oriented research, the knowledge that comes from studying the designed artefact in use or from the process of bringing the product into being should be seen as the main contribution—the ‘result’—while the artefact that has been developed becomes more of a means than an end.” (Fällman, 2007 p 3). This distinction is important, for just as Stolterman (2008) has distinguished between the complexities of design and science, there are also challenges distinct to the practice of research as compared to the practice of design, which will be discussed in section 3.1.2.1.

This section discusses the unique complexities and methodologies of design research, highlighting the differences from scientific research. Building on this, below section 3.1.2.1 traces the evolution of design research, from structured methods to more reflective, human-centric approaches.

3.3.1 The evolution of design research

Over the decades, the field of design research has evolved into several distinct directions, encompassing areas such as design history, the socio-cultural role of design, the structure of the design process, and designers' creativity. Buchanan (2008, 2009) identifies three broad methodological strategies within this field: the dialectic, design science, and design inquiry. The dialectic represents a socio-cultural-historical approach, examining design's evolution, its role in society, and its interface with culture. It aims to explain design within a larger system by addressing conflicting opinions and values (Buchanan, 2008, 2009). Design science offers a technical perspective, it focuses on formalizing and replicating the design process, treating it as an activity distinct from the human actor (Simon, 1969). Design inquiry, on the other hand, considers design as an activity involving human actors and situations, emphasizing designers' creative capacity and the discipline of making (Buchanan, 2008).

Design inquiry links to various contributions within design, including the design methods movement led by John Chris Jones (1991, 1992) , Bruce Archer (Archer, 1981), Nigel Cross's

(Cross, 2001) theory of designerly ways of knowing, and Donald Schön's (Schön, 1992) reflective practice proposals. The design methods movement aimed to structure and manage design processes rigorously but eventually faced criticism for neglecting human creativity and values (Buchanan, 2009; McDonnell, 2015). From the late 1970s, a more diverse program of empirical research emerged, focusing on designers' cognitive processes and interactions (Cross, 1999, 2007; Lawson, 2006, 2012). Schön's work, particularly in "The Reflective Practitioner," highlights the cyclical model of experimentation and evaluation in design, emphasizing reflection-in-action and reflection-on-action as core components of a practical theory of knowledge (Schön, 1992).

In early 2000s, design research involving design practice has gained prominence, driven by the academization of the field in countries such as the United Kingdom, Scandinavia, Australia, and mainland Europe. This shift was partly due to the integration of art schools and polytechnics into the university system, which necessitated the development of a research culture within design faculties (Melles, 2007; Simonsen and Robertson, 2012; Ehn, 2017). This transformation led to what Mary Henkel describes as a "crisis of identity" among design faculties, transitioning from a practice-oriented discipline to one embracing research within academic norms (Henkel, 2000).

As the field evolved away from the concept of 'design science' (Cross, 2001), practitioners like Alexander (1982) and Schön (1992) advocated for a more reflective approach. Schön (1992) highlighted this by stating that practitioners often demonstrate the ability to reflect on their intuitive knowledge during action, using this to navigate complex and uncertain situations in practice. This reflective capability suggests a methodological flexibility within design research, essential for practitioners in the field. Cross (Cross, 2007) noted that while method might be crucial in science, it is not as critical in design practice where outcomes do not need to be repeatable and should often avoid repetition or copying. Furthermore, Cross (1999) proposed a taxonomy of design research that focuses on the knowledge inherent in people, processes, or products rather than solely on research methods.

This research is situated within the realm of design research, employing an embedded model of reflection and action. Specifically, it utilizes the approaches of Research 'on', 'in', and 'through' design, which is further elaborated in below section 3.1.2.2.

3.3.2 Research 'on', 'in', and 'through' design

The distinctions in design research methodologies further evolved with Christopher Frayling's (1993) seminal paper "Research in Art and Design", which has profoundly influenced

contemporary discussions on design research. Frayling characterized research as a practice on par with other forms, stating, "Research is a practice, writing is practice, doing science is practice, doing design is practice, making art is a practice" (Frayling, 1993, p. 4). He distinguished between three types of research in the arts and design: research 'into', 'through', and 'for' art and design. These categories have become foundational in understanding and advancing design research.

Basic: Research into Design involves systematic investigations into various aspects of design, aiming to expand knowledge and understanding of design theory, principles, and methods. This approach includes historical studies of art, analyses of design processes, and investigations into the impact of design on society. The focus is on generating theoretical insights that contribute to the broader field of design knowledge. Buchanan (2001) and Downton (2003) highlight this approach's role in documenting case studies and empirical data collection, expanding the theoretical framework of design.

Applied: Research through Design uses design practice as a means of inquiry and knowledge generation. Designers engage in hands-on exploration, experimentation, and prototyping to gain insights and generate new understandings. The process of designing and creating becomes a method of investigation, with outcomes contributing to both practical and theoretical knowledge in design. This approach integrates design practice with reflective inquiry, creating broader theoretical frameworks and innovative methodologies (Buchanan, 2008; Jonas, 2008).

Clinical: Research for Design refers to activities that directly inform and support the practice of design, addressing specific design challenges and improving design outcomes. It includes user research, market analysis, material investigations, and usability studies. The goal is to gather information and insights that can be applied in the design process to develop effective design solutions. Originally termed clinical research, this category emphasizes providing practical solutions tailored to immediate design challenges (Downton, 2003; Buchanan, 2008).

Niedderer and Roworth-Stokes (2007) emphasize the importance of categorizing the roles of practice within research to clarify its contribution to knowledge, benefiting both researchers and practitioners. This framework allows practitioners to integrate their creative practice within the research paradigm, driven partly by funding structures that prioritize research. They note that art and design disciplines are not eligible for research funding under their own categorization before the Research Assessment Exercise (RAE) of 1992. The RAE enables the formal recognition of creative outputs, such as inventions of ideas, images, performances, and artefacts, as valid contributions to research.

Douglas et al. (2000) discuss the positioning of the practitioner as a researcher, highlighting the shift toward recognizing practice as a legitimate form of research that can generate new insights and knowledge. This perspective aligns with Frayling's (1993) initial categorization but extends it by emphasizing the methodological rigour and reflective practice necessary for practice-based research to be accepted within the academic community. Candy's discussion on practice-based research differentiates it from practice-led research, suggesting that practice-based research involves creating artefacts that contribute to knowledge, while practice-led research concerns the nature of practice and its operational significance (Candy, 2006; Candy and Edmonds, 2017, 2018).

Since Frayling's (1993) framework, the field of design research continues to evolve into a more integrated and dynamic field, emphasizing the interconnectedness between research categories. This evolution reflects a maturation in how designers and researchers conceptualize, investigate, and apply knowledge within the evolving landscape of design. The understanding of design research progresses from problem-solving to knowledge creation and theory-building, contributing to both practical design solutions and theoretical advancements within the discipline (Roth, 1999; Friedman, 2000).

The evolution of design research underscores its progression from practical problem-solving to generating new theoretical insights and methodologies, contributing significantly to both the practice and theory of design. Frayling's framework lays the groundwork for recognizing the role of creative practice in contributing to knowledge, which is further explored and expanded upon in subsequent studies.

In summary, the evolution of design research embraces a more inclusive view of creative practice, recognizing its potential to contribute to knowledge in meaningful ways. This inclusive view supports the notion that design research is not limited to traditional scientific methods but also encompasses creative and reflective practices that contribute significantly to the body of knowledge in art and design.

3.4 My approach

Building upon the comprehensive discussion in Section 3.1.2.2, my research approach incorporates the three types of design research identified by Frayling (1993): research 'on', 'in', and 'through' design. This multifaceted approach is strategically framed by the overarching research question: "What can Design for Sustainability learn from traditional Indian products and practices?" My research aims to bridge contemporary Design for Sustainability with

traditional Indian products and practices, employing a holistic methodology that addresses various dimensions of design research.

Basic: Research into design

To critically evaluate and deepen my understanding of contemporary design for sustainability, I utilized a systemic literature review, aligning with **RO 1:** *To develop a critical understanding of modern approaches to Design for Sustainability.* And **RO 2:** *To consider the relationship between traditional knowledge, sustainability and design, with a focus on the Indian context.* This rigorous investigation enabled me to dissect modern approaches to sustainability in design, offering a robust theoretical framework. Furthermore, I explored traditional Indian products and practices to achieve **RO 3:** *To identify and document traditional Indian products and practices that are still relevant to contemporary lifestyles through autoethnographic case studies.* and **RO 4:** *To conduct a detailed analysis of selected traditional Indian products and practices to assess to evaluate their alignment with sustainability principles, including evaluations of materials, production processes, and lifecycle considerations, and to highlight sustainability aspects through comparative studies with modern equivalents.* Additionally, I examined the motivations and inclinations of contemporary design professionals engaged in the traditional craft sector in India, **RO 5:** *To conduct interviews with contemporary design professionals in India to understand their motivations and inclinations towards traditional crafts and sustainable design.* This segment of my research underscores the importance of theoretical inquiry in expanding the knowledge base of Design for Sustainability. My engagement in this knowledge generation encompasses the components laid out by Stroni (2015) and Stead (2020) that is “design can be used to produce different forms of knowledge in different ways depending on research questions, epistemological stances, as well as departments and their ways of operating” (Storni, 2015) and “like Frayling, Storni and Bowers, I argue that the resulting knowledge does not necessarily have to be ‘scientific’ in nature, nor contribute to established scientific disciplines nor be ‘valid’ or replicable as is designated by scientific traditions” (Stead, 2020).

Clinical: Research for design

This approach directly informed my practice, guiding the development of a framework for designing contemporary products that incorporate insights from traditional Indian products and practices, **RO 6:** *To develop a comprehensive framework for designing holistic and meaningful products, based on insights from objectives 3, 4 and 5.* By focusing on practical outcomes, this research mode ensured that the knowledge generated was applicable and beneficial for real-

world design challenges. The framework developed serves as a practical tool for designers, aiding in the creation of holistic and meaningful sustainable products that draw on the wisdom of traditional knowledge and practices.

Applied: Research through design

Emphasizing a hands-on, creative process, this approach allowed me to design a contemporary everyday product that integrate traditional insights and adhere to sustainability principles, **RO 7: *To design a contemporary everyday product incorporating insights from traditional Indian products and practices – and evaluate to determine its compliance with sustainability principles.*** Through iterative exploration, experimentation, and prototyping, I generated new understandings and knowledge. This practice-based inquiry aligns with Frayling's notion that design itself can be a mode of investigation, where the act of creating artefacts contributes to both practical and theoretical knowledge. This approach also incorporated reflective practices, both personal and academic, enhancing the depth and validity of the research outcomes.

My research approach is deeply embedded within academic reflection, encompassing personal deliberations, engagement with existing literature, and active participation in academic contributions such as publications, seminars, and conferences. This reflective dimension ensures that the research is continuously scrutinized and refined, fostering a dynamic and evolving understanding of design for sustainability.

By integrating the three approaches delineated by Frayling, my research not only addresses practical design challenges but also contributes to the broader theoretical discourse in design research. This holistic methodology is rooted in the understanding that design research is multifaceted and that knowledge can be generated through various modes of inquiry, each offering unique insights and contributions. The comprehensive exploration of traditional Indian products and practices within the context of contemporary sustainability challenges exemplifies the potential of design research to bridge traditional wisdom with contemporary ways of living, ultimately enriching both the practice and theory of design.

3.4.1 Methodology

The methodology is the overarching design of a research informed by a chosen theoretical perspective. This is to do with how the researcher gathers and interprets knowledge. The methodology is the researcher's philosophical outlook on and beliefs about life, learning and knowledge, and as such it is the lens through which the researcher will look at answering the

research questions. In a way this is a specific viewpoint and opinion that the researcher takes and a framework within which the researcher operates. For this study, methodology is guided by a constructivist ontology and interpretivist epistemology utilising a case study approach as the overall research question seeks to gain concrete, contextual, in-depth knowledge about a specific real-world subject and a case study approach allows the exploration of key characteristics, meanings, and implications of the traditional Indian products and practices (Creswell, 2007). This section therefore describes the purpose of the research, strategies of inquiry and type of data collection.

3.4.2 The purpose of the research study

The purpose of a research study refers to the overarching goal or objective that guides the entire research project. The purpose provides a clear statement of what the researcher intends to achieve through the study. The specific purpose of a research study can vary depending on the research question, discipline, and context. However, some common purposes of research studies include (Adopted from (Robson, 2011)):

Table 3 Types of research studies include (Adopted from (Robson, 2011))

Research types	Descriptions
Exploratory research	<ul style="list-style-type: none"> • To clarify and define the nature of a problem; • To generate more recent information and ideas; • To assess phenomena in a new light; • To generate new ideas, conjectures, or hypotheses; • To formulate more precise issues for future research; • Usually qualitative research.
Descriptive research	<ul style="list-style-type: none"> • To describe and interpret the characteristics of the specific details of a situation, social settings or relationship without investigating causal relationships; • To locate new data that contradict past data; • To clarify a sequence of steps or stages; • To document a causal process or mechanism; • To report on the background or context of a situation; • The basis for all other forms of research • Mixed use of qualitative and quantitative methods
Explanatory research	<ul style="list-style-type: none"> • Seeks an explanation for a situation or problem, traditionally but not necessarily, in the form of causal relationships; • To explain patterns relating to the phenomenon being researched; • To identify relationships between aspects of the phenomenon; • Mixed use of qualitative and quantitative methods
	<ul style="list-style-type: none"> • With social justice at its heart, involves critical consciousness to challenge dominant narratives;

Emancipatory research	<ul style="list-style-type: none"> • Seeks to empower the subjects of social inquiry; • Similar to participatory action research that recognizes the power imbalance in research; • To create opportunities and the will to engage in social action; • Often in a form of “research with” instead of “research in or for”; • Usually with qualitative methods.
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This research combines exploratory, descriptive and explanatory research. According to the characteristics of the research questions of the study (see, section 3.1), and the findings identified from the literature (see, section 2.2), the research seeks an understanding of the traditional everyday products and practices in India, and their relevance in contemporary ways of living. It also seeks to explore the approaches as well as design’s contribution that can help design to move towards a holistic and meaningful sustainable future. There is only limited published evidence regarding the traditional products and practices in India and around the approaches and design’s contribution around those products at a general theoretical level. By adopting an exploratory research approach, I investigated a topic that has limited prior research and aided to generate initial insights, identify research gaps, and lay the groundwork for future studies. Therefore, this research is predominantly exploratory in nature. However, the research inevitably involves some description and explanation of the traditional products and practices and contemporary modern products, describing their uses, making process, meanings, advantages and disadvantages etc. Employing descriptive and explanatory research study enabled me to provide comprehensive description of traditional products and practices in India and to understand the relationships between variables. It also helped to explain why certain phenomena occur, how they are connected, or what factors influence them.

3.4.2.1 Type of data collection

The purpose of a research study can lead to the adoption of both qualitative and quantitative research approaches. The decision to use qualitative or quantitative methods, or a combination of both, depends on the research objectives, the nature of the research question, and the available resources. This study primarily adopts exploratory research, which “rarely yields definitive answers, and it must be creative, open minded, and flexible” (Neuman, 2011, p. 38). Therefore, qualitative methods are used in exploratory research. Additionally, when combining exploratory, descriptive, and explanatory research, a qualitative approach can play a crucial role in providing rich, in-depth insights and understanding of the research topic.

Traditional products and practices are commonly understood as phenomenon involving a variety of elements centred around particular cultures, regions, communities etc. Adopting a qualitative approach allowed the complexity, contextuality and richness of the traditional products and practices to be captured as well as enabling deeper exploration of cultural and/or social influences.

3.4.2.2 Research strategies of inquiry

A research strategy of inquiry refers to the overall plan or approach that guides the entire research process. It provides a roadmap for conducting the research strategies of inquiry are not mutually exclusive, and researchers often use a combination of strategies to address their research questions or objectives, by taking into consideration the purpose of the research, the role of the researcher, the data that was to be collected, the method of data analysis that to be applied and how the results will be presented. The choice of research strategy of inquiry depends on various factors, including the nature of the research question, the available resources, the research field or discipline, and the desired outcomes of the study.

Given that the research is combination of explorative, descriptive, and explanatory in nature and the research questions involve both “what” and “how” questions, case study research approach was used.

3.4.2.3 Case Study

Case study methodology is a research approach that involves in-depth exploration and analysis of a single or a few cases, within their real-life context, to gain a comprehensive understanding of a particular phenomenon (Stake, 1995). This methodology, which integrates various research approaches such as naturalistic, holistic, ethnographic, phenomenological, and biographical methods, is described by Stake as a “palette of methods” that offers flexibility and adaptability in research design (Stake, 1995, pp. xi–xii).

The focus of case study research is on understanding specific cases rather than adhering to rigid methodological rules. This approach draws from naturally occurring sources of knowledge, such as personal experiences and observations of interactions within real-world contexts (Stake, 2008). Case study research is particularly valuable when investigating real-life, contemporary, and complex phenomena, as it involves an extensive data collection effort using multiple sources, such as interviews, observations, and documents. The goal is to provide a detailed

description and analysis of the case, identifying key themes and insights (Creswell and Poth, 2016, p. 97).

Case studies can be classified into three categories: intrinsic, instrumental, and collective. An intrinsic case study focuses on understanding the particularities of a single case, while an instrumental case study aims to gain insights into a broader issue or theory. A collective case study involves examining multiple cases concurrently or sequentially, where each case is studied individually but contributes to a broader understanding of the research topic (Stake, 1995).

This research adopts a collective case study approach, focusing on six traditional Indian products and practices as individual cases within the larger context of India’s cultural and historical background. This approach allows for a detailed, holistic examination of each practice while also enabling cross-case comparisons to uncover broader themes and insights. The case is built through an ongoing relationship between the researcher and the individuals involved and is presented in a way that actively involves the reader, inviting them to participate in this interaction and the process of case exploration (R E Stake, 1995).

Table 4 Characteristics of case study (Stake, 1995)

Characteristic	Case study
Focus	Developing an in-depth description and analysis of case or multiple cases
Type of problem best suited for design	Providing an in- depth understanding of a case or multiple case
Discipline Background	Drawing from psychology, law, political science and medicine
Unit of analysis	Studying an event, a program, an activity, more than one individual
Data collection forms	Using multiple sources such as interviews, observations, documents and artefacts
Data analysis strategies	Analysing data through description of the case and themes of the case as well as cross-case themes
Written report	Developing a detailed analysis of one or more cases

3.4.2.4 Rationale for choosing case study methodology

The decision to use case study methodology for this research is based on its suitability for gaining an in-depth understanding of the complex and context-specific nature of traditional Indian products and practices. According to Stake (1995), case study research allows for the

exploration of a phenomenon within its real-life context, making it ideal for examining the rich cultural, historical, and social aspects of these practices.

The flexibility of case study methodology, described as a 'palette of methods', enables the integration of various data collection techniques such as interviews, observations, and document analysis. This eclectic approach facilitates a deeper exploration of the six traditional practices, capturing the complexities and nuances of each case (Stake, 2008; Thomas, 2011).

This study adopts a collective case study approach, incorporating both intrinsic and instrumental elements. Each of the six traditional practices is studied individually to understand its unique characteristics, while the collective examination offers a broader perspective on how these practices contribute to India's cultural heritage and their relevance in contemporary contexts. This approach ensures that the findings are not only meaningful within the Indian context but can also inform broader discussions on traditional practices and their adaptation in modern times.

Case study methodology is well-suited to this research as it allows for a holistic understanding of the 'what', 'why', and 'how' of the research questions. It provides the necessary depth and context to explore the traditional practices in detail while offering the flexibility to address the complexities of the subject matter (Yin, 2003). This methodology will contribute both practical insights and theoretical advancements in the study of traditional Indian products and their contemporary applications.

This research adopts a collective case study approach, encompassing both intrinsic and instrumental elements. According to Punch (Punch, 2004, p. 119), "The first two (intrinsic and instrumental) of these are single case studies, where the focus is within the case. The third (collective) involves multiple cases, where the focus is both within and across cases." In this research, India is considered the primary case, with six traditional products and practices serving as individual cases within this larger context. Each practice is investigated individually to understand its unique characteristics, while the collective examination provides a comprehensive understanding of traditional Indian ways of living, craftsmanship and its contemporary applications.

Reflecting on Neuman's (Neuman, 2011, p. 42) criteria, case study methodology offers several strengths that are particularly relevant for this research:

1. *Conceptual validity.* Case studies help to “flush out” and identify concepts/variables that are of greatest interest and move toward their core or essential meaning in abstract theory.
2. *Heuristic impact.* Case studies are highly heuristic (i.e., providing further learning, discovery, or problem solving). They help with constructing new theories, developing or extending concepts, and exploring the boundaries among related concepts.
3. *Causal mechanisms identification.* Case studies have the ability to make visible the details of social processes and mechanisms by which one factor affects others.
4. *Ability to capture complexity and trace processes.* Case studies can effectively depict highly complex, multiple-factor events/situations and trace processes over time and space.
5. *Calibration.* Case studies enable researchers to adjust measures of abstract concepts to dependable, lived experiences and concrete standards.
6. *Holistic elaboration.* Case studies can elaborate on an entire situation or process holistically and permit the incorporation of multiple perspectives or viewpoints.

In summary, the choice of case study methodology for this thesis is driven by its ability to provide a nuanced, contextual, and holistic understanding of traditional Indian products and practices. By adopting a collective case study approach, this research will comprehensively investigate six traditional products and associated practices within India as the primary case. Each product serves as an individual case as components of larger case study, contributing to a broader understanding of the phenomenon. This approach ensures that the findings are not only relevant to the Indian context but also demonstrate applicability in other cultural and geographical settings, thereby enriching the theoretical and practical insights derived from the research.

India is the primary focus of this research, with traditional Indian products and practices being investigated in depth as the central case study. However, the insights gained from this case study have broader implications, as there is much to learn from other contexts as well. The case study methodology remains the overarching approach because it allows for a detailed exploration of the Indian context, while also acknowledging that valuable lessons and comparative insights may emerge from other cultural and geographical settings. By focusing on India, this research aims to contribute to a global understanding of how traditional knowledge and sustainability intersect, drawing on diverse practices and perspectives from different regions and disciplines.

Table 5 Methodology selected for this research study

Methodology selected for this research study			
Research Paradigm	Ontology	Epistemology	Methodology
	What is reality?	How do I know reality?	How do you go about finding out?
Constructivist/ Interpretive	There is no single reality or truth. Reality is created by individuals in groups (less realist)	Therefore, reality needs to be interpreted. It is used to discover the underlying meaning of events and activities.	Case Study

3.5 Research design for this study

Research design refers to the overall plan or structure that guides the execution of a research study. How to devise and conduct the research depends largely on the nature and purpose of the research. According to Saunders and Tosey (2013), the overarching structure of the research not only guides choices concerning data collection and analysis methods but also influences approaches for synthesizing information and its interpretation. Aligned with the project's exploratory purpose and selected methodologies, the research was strategically phased to address research questions and achieve objectives. The overall research phases encompassed theoretical exploration (2020-2021), data collection (2021 - 2022), data analysis (2022 - 2023), synthesis and documentation of research findings (2022 - 2023), and validation of research outcomes (2022 - 2023).

Table 6 Research phases and approaches

Phases	Objectives	Methods	Approach
Theoretical exploration (2020-2021)	1: To develop a critical understanding of modern approaches to Design for Sustainability.	Literature review Notes	Research into Design
	2: To consider the relationship between traditional knowledge, sustainability and design, with a focus on the Indian context.		
Data collection (2021 - 2022)	3: To identify and document traditional Indian products and practices that are still relevant to contemporary lifestyles through autoethnographic case studies.	Autoethnography	
	4: To conduct a detailed analysis of selected traditional Indian products and practices to assess to evaluate their alignment with sustainability principles, including evaluations of materials, production processes, and	Case study	

	lifecycle considerations, and to highlight sustainability aspects through comparative studies with modern equivalents.		
	5: To conduct interviews with contemporary design professionals in India to understand their motivations and inclinations towards traditional crafts and sustainable design. Furthermore, to bring third-party perspectives to the research to help make sense of the autoethnographic findings.	Semi-structured interviews	
Data analysis (2022 - 2023)	6: To develop a comprehensive framework for designing holistic and meaningful products, based on insights from objectives 3, 4 and 5.	Thematic analysis	Research for Design
	7: To design a contemporary everyday product incorporating insights from traditional Indian products and practices – and evaluate to determine its compliance with sustainability principles.	Prototyping	Research through Design
Validation of research outcomes	The initial findings have been validated in the form of conference presentations, peer-reviewed journal articles, academic forums See Section 3.1.9 for the detail of the research validation and Declaration for the publication list.		

3.5.1 Data collection

3.5.1.1 Literature review

In order to identify the knowledge gap, literature was reviewed on traditional knowledge in general, design for sustainability and traditional knowledge and practices in India. This was a library and internet-based literature review. The purpose of reviewing literature is to collect the ideas and perceptions of others and thus analyse their relevance; for example, in what ways they might connect with and enhance the understanding gained from my own subjective experience (Walton, 2008). Fundamentally, knowledge advancement must be built on prior existing work. To push the knowledge frontier, we must know where the frontier is. By reviewing relevant literature, we understand the breadth and depth of the existing body of work and identify gaps to explore (Xiao and Watson, 2019). It can broadly be described as a more or less systematic way of collecting and synthesizing previous research (Baumeister and Leary, 1997; Tranfield, Denyer and Smart, 2003). An effective and well-conducted review as a research method creates a firm foundation for advancing knowledge and facilitating theory development (Webster, 2002). By integrating findings and perspectives from many empirical

findings, a literature review can address research questions with a power that no single study has. It can also help to provide an overview of areas in which the research is disparate and interdisciplinary.

The materials being searched were conceptions and theories related to research methodology, tradition, modernity, sustainability, design for sustainability, traditional practices in India, etc.

3.5.1.2 Autoethnography

Autoethnography emerged as a response to the 'crisis of representation' in the social sciences during the early 1980s. This crisis was driven by young anthropologists who questioned the traditional claims of anthropology regarding the knowledge it produced (Turner and Bruner, 1986; McGill and Clifford, 1989; Clifford *et al.*, 2020). The seminal volume "Writing Culture," edited by Clifford and Marcus (Clifford *et al.*, 2020), encapsulated this critique. As summarized by Rees (Rees, 2008), the volume argued that genre constraints governed ethnographic writing, often reinforcing colonial perspectives and power asymmetries. These constraints led ethnographers to portray cultures as timeless and spatially bound, thus denying mobility and silencing the voices of the natives (McGill and Clifford, 1989).

This critique was not isolated to anthropology but resonated across various disciplines, including geography, where scholars began questioning the conventions of constituting research objects, gathering information, and developing representations that counted as knowledge. This broad intellectual and professional crisis, known as the 'crisis of representation,' involved ontological, epistemological, methodological, representational, and political aspects (McGill and Clifford, 1989; Denzin, 2012). The crisis of representation highlighted the epistemological problem of researchers claiming an authoritative 'God's eye view' while absenting themselves from their writing. This approach ignored the partiality and positionality inherent in knowledge production, thus perpetuating the illusion of objective and unmediated representations of reality. It was also an ontological problem, as it constrained the understanding of research objects within ideologically suspect frameworks, such as bounded cultures and the anthropological present (McGill and Clifford, 1989).

In response, researchers across social sciences and humanities sought experimental forms of representation that challenged the realist tradition of ethnographic writing. This involved adopting processual and confessional styles that emphasized the interaction between the biographically situated researcher and the research setting (Crang and Cook, 2012; Denzin, 2012; Campbell, 2014). These approaches aimed to demystify fieldwork by showing the

practicalities of participant-observation (Van Maanen, 2013). They also sought to dismantle the anthropological convention of separating self-narratives and methodological reflections from the main analytical discourse (Pratt, 1994; Hardwick, 2001; Rabinow, 2019; Malinowski, 2020).

Autoethnography emerged as a significant non-conventional writing form within this movement, foregrounding the emotions and experiences of the researcher to acknowledge the subjective nature of knowledge. By using subjectivity deliberately as an epistemological resource, autoethnography represents a performance of critical reflexivity (England, 1994). It breaks down the conventional ethnographic distinction between researcher and subject, treating the self as both an object of research and an epistemological and ontological resource. This shift challenges the notion of the researcher as distinct from the research subjects and emphasizes the interconnectedness of their experiences and knowledge production processes.

Pratt (1994, 1996, 2007) further expanded the concept of autoethnography by highlighting the self-representations produced by research subjects in dialogue with ethnographic representations. This approach shifts the focus from culture as a static entity to transculturation as a dynamic process, requiring researchers to view themselves as agents of transculturation and to imagine fieldwork as a site of continuous cultural exchange. Despite initial resistance, this reflexive turn in ethnographic writing has gradually led to more nuanced understandings of fieldwork and representation. Marcus (Rabinow *et al.*, 2021) emphasized the importance of reflexivity for addressing ontological questions, suggesting that researchers' self-examination can illuminate the complexities of fieldwork and the interconnectedness of researcher and subject. This perspective encourages a recognition that research fields occupy a space between overlapping categories of researchers, subjects, and objects of study (Butz, 2010).

Autoethnography, as a form of self-narrative that places the self within a social context (Reed-Danahay, 2021), thus serves as a crucial methodological tool for addressing the crisis of representation. It enables researchers to engage critically with their positionality and the cultural contexts they study, fostering a more inclusive and empathetic approach to knowledge production. By embracing the subjective and reflexive dimensions of research, autoethnography contributes to a deeper understanding of cultural phenomena and the complexities of human experiences within broader social frameworks.

Key characteristics of autoethnography

Personal narrative and cultural context: autoethnography foreground personal experience within cultural contexts, emphasizing the researcher's immersion in the culture under study.

This approach uses personal narratives to illuminate social and cultural dynamics, highlighting the value of lived experiences as sources of knowledge (Holman Jones, Adams and Ellis, 2013).

Critique and commentary on culture: unlike traditional ethnography, autoethnography encourages researchers to critically engage with cultural practices and norms. Through introspection and reflexivity, researchers examine how personal experiences intersect with larger social structures, offering nuanced insights and critiques of cultural phenomena (Holman Jones, Adams and Ellis, 2013).

Contribution to existing research: autoethnographies enrich scholarly discourse by adding depth and richness to existing research. By integrating personal stories with theoretical insights, researchers can offer new perspectives that challenge conventional wisdom and expand understanding of cultural complexities (Holman Jones, Adams and Ellis, 2013).

Embracing vulnerability with purpose: central to autoethnography is the notion of embracing vulnerability with a purpose. Researchers openly acknowledge their subjectivity and positionality, recognizing how personal biases and experiences shape their interpretations. This transparency enhances the credibility and authenticity of the research, fostering empathy and connection with readers (Holman Jones, Adams and Ellis, 2013).

Methodological approach

Autoethnography involves a systematic process of data collection, analysis, and interpretation.

Data collection: researchers collect data primarily through introspection, personal narratives, and field notes that document lived experiences within cultural contexts. This may include journal entries, letters, photographs, and other artefacts that capture the researcher's journey (Holman Jones, Adams and Ellis, 2013).

Analysis: analysis in autoethnography involves a recursive process of reflection and interpretation. Researchers critically examine their experiences, identifying recurring themes, cultural patterns, and emotional responses that shed light on broader social phenomena (Holman Jones, Adams and Ellis, 2013).

Interpretation: through reflexive writing, researchers contextualize their findings within existing literature and theoretical frameworks. They explore how their personal experiences contribute to understanding cultural dynamics, offering nuanced interpretations that challenge conventional wisdom (Holman Jones, Adams and Ellis, 2013).

Contribution to knowledge

Autoethnography generates rich, contextually embedded knowledge and fosters empathy and understanding by highlighting the human dimensions of cultural practices. By embracing vulnerability and subjectivity, researchers contribute to a deeper appreciation of diverse lived experiences and promote dialogue on pressing social issues (Holman Jones, Adams and Ellis, 2013).

In summary, autoethnography stands as a methodological approach that blends personal narrative with cultural critique, offering profound insights into human experiences within broader social contexts. By documenting and analysing personal journeys, researchers illuminate the complexities of culture, enriching scholarly discourse and advocating for inclusive, empathetic research practices (Holman Jones, Adams and Ellis, 2013). This comprehensive engagement with lived experiences underscores autoethnography's enduring relevance and impact in exploring and interpreting cultural phenomena.

The role of autobiography in critiquing culture and cultural practices

Autoethnography leverages personal experience to comment on and critique culture and cultural practices. By integrating autobiographical narratives, researchers can provide a nuanced critique of cultural norms and societal structures from an insider perspective. This approach challenges the objectivity of traditional ethnography by highlighting the subjective and interpretive nature of cultural understanding. Through their personal narratives, autoethnographers illuminate the complexities of cultural practices, revealing how individual experiences intersect with larger social, political, and cultural forces. For instance, my imaginative exercise, envisioning a typical day in rural India, allowed for a rich exploration of daily actions, practices, and products encountered during childhood or witnessed in my grandparents' use. These scenarios were carefully noted for further analysis (Ellis and Bochner, 2000; Reed-Danahay, 2021).

Contribution to existing research

Autoethnography adds depth to existing research by providing rich, contextualized insights that are often missing in conventional ethnographic studies. The personal narratives offer a deeper understanding of the emotional and relational aspects of cultural phenomena, enriching the data with layers of meaning that quantitative methods might overlook. This method bridges the gap between personal experience and broader cultural patterns, contributing to a more comprehensive understanding of social issues. For instance, the detailed notes taken during the imaginative exploration of a day in rural India helped reflect on individual practices and

particular actions involved in day-to-day activities. This approach enabled me to connect theory and practice, illustrating abstract concepts through concrete, relatable experiences (Ellis and Bochner, 2000; Besio and Butz, 2004; Butz, 2010).

Embracing vulnerability with purpose

Autoethnographers embrace vulnerability to achieve a greater purpose, such as fostering empathy, encouraging self-reflection, and promoting social change. By sharing personal stories that include moments of vulnerability, researchers create a space for readers to connect with their experiences on an emotional level. This openness invites readers to reflect on their own lives and question their assumptions, fostering a deeper engagement with the research. My reflections on the cultural significance and everyday implications of objects, such as tools and ingredients used in food preparation and preservation, illustrate this vulnerability and the broader impact of these practices (Tedlock, 1991; Richardson, 2000).

Using lived experience in research

Incorporating my lived experience into my research allowed me to provide a unique and intimate perspective on the cultural phenomena I studied. By drawing on my personal history, I was able to offer insights that might not have been accessible through traditional research methods. The detailed notes and reflections on specific objects, emphasizing their use and lifetime, served as primary data sources for subsequent narrative descriptions. These notes captured actions, practices, and products encountered during the recollected day in rural India and helped in reflecting on their spiritual, religious, and ceremonial significance. This approach provided a deeper understanding of how these objects are made and consumed in localized ecosystems (Valentine, 1998; Ellis, 2004).

Addressing potential biases

Using personal experience in research inherently introduces biases, as my perspectives and interpretations are influenced by my unique background and identity. To address these biases, I employed several strategies. Firstly, I continuously reflected on my positionality and how my background, beliefs, and experiences might shape my research. This reflexive practice helped me remain aware of potential biases and their impact on my analysis and interpretations (Denzin, 2012). Secondly, I used multiple data sources and methods to cross-verify my findings. This approach helped ensure that my personal experiences were corroborated by other evidence, thereby enhancing the credibility of my research (Richardson, 2000). Thirdly, I engaged with peers, mentors, and research participants to validate my interpretations and

conclusions. This collaborative process allowed for diverse perspectives to challenge and refine my analyses, mitigating the influence of my personal biases (Besio and Butz, 2004). Lastly, I maintained transparency in my writing by explicitly acknowledging my subjectivity and the potential biases it introduces. By being open about my positionality, I aimed to provide readers with the context needed to critically assess my findings (Ellis and Bochner, 2000). Through these strategies, I aimed to balance the richness of my personal narrative with the rigor and objectivity required for scholarly research, thereby enhancing the validity and reliability of my work.

To enhance the rigor of the autoethnographic analysis, it is essential to anchor the process within the theoretical framework of Constructivism and Interpretivism, which underpins my research approach. Constructivism, with its emphasis on the co-construction of knowledge through interaction and context, allows for a deeper understanding of the researcher's subjective experience within the cultural context being explored (Guba and Lincoln, 1994). This perspective aligns with the autoethnographic method, which emphasizes reflexivity and personal narrative as a means of uncovering the layers of meaning embedded in lived experiences. By interpreting personal experiences within the broader social, cultural, and historical contexts, the analysis reflects the interpretivist stance, where meaning is constructed through the researcher's engagement with the world (Bryman, 2016). Through this lens, the autoethnographic process becomes not just a recounting of personal experiences but an active interpretation of those experiences in relation to the broader scholarship on Research through Design (RtD). The integration of these theoretical underpinnings ensures that the data analysis is both rigorous and meaningful, situating the self within a wider discourse on design, culture, and sustainability. By situating my reflections within the scholarly conversation on RtD, I can also highlight the ways in which my personal experiences contribute to the broader field, thereby advancing both methodological understanding and theoretical knowledge.

3.5.1.2.1 My autoethnographic process

The autoethnographic data collection commenced with an imaginative exercise, envisioning a typical day in rural India. This exercise allowed for the exploration of daily actions, practices, and products encountered during childhood or witnessed in my grandparents' use. These scenarios were carefully noted for further analysis. This imaginative exploration served as the foundation for identifying key actions, practices, and products that were central to the study. Detailed notes were taken during the imaginative exploration and served as forming narratives and detailed descriptions of a day in rural India (see section 4.2, for a brief description of a typical day in rural India).

These notes captured each action, practice, and product encountered during the recollected day in rural India and helped me to reflect further on individual practices and particular actions involved in day-to-day activities, this also involved reflecting on specific objects those activities involved. This consisted of wide categories in terms of practices and products, e.g., I looked at food preparation and food preservation within this I looked at various techniques, tools and objects involved, prominent ingredients, recycle recipes to utilise leftovers,

These reflections aimed to provide a deeper understanding of cultural significance and everyday implications of those objects, how they are made and consumed in localised ecosystems and how these objects hold different meaning and values in terms of their spiritual or religious significance and ceremonial use, etc. Alongside this, I started to break down the details and categorise these practices and products into various categories of contemporary design for sustainability principles and quadruple bottom line of sustainability. This process involved multiple iterations and ideations to decide and define final subcategories to categorise the narratives about each product. As the imaginative exploration unfolded, detailed notes were taken, capturing each action and the associated objects.

I started to keep a digital and physical research diary or notebook at the beginning of my research in order to keep a record of my thoughts. The main function of was to record my ideas, improvements, questions, and doubts, which are all reflections on-my work. The notes I made have appeared in the form of texts, schemes, diagrams, drawings etc. Besides writing notes during lectures, workshops, and seminars, I kept writing them in any situation: during my work of producing objects, on the bus on the way to university or back home, in the cafe, or whilst enjoying the sunshine at the city park. These notes served as primary data sources for the subsequent narrative description. Alongside this, individual reflections were carried out on specific objects, emphasizing their use and lifetime. These reflections were meticulously recorded in a dedicated notebook.

3.5.1.2.2 Components of case study

This study explored a numerous examples everyday traditional products and practices in India which are directly or indirectly based on handcrafting. Each example therefore is a component of the overall case study. These examples represent a broad category with in-depth analysis of various aspects of each practice. The examples consist of everyday products and practices relating to food preparation, cooking, food preservation, architecture, cleaning and bathing practices, furniture, textile, etc. Furthermore, the QBL (Walker, 2011a) framework is used to analyse and categorise these examples. These case studies are collected from my experience of

growing up in India and my observations of Indian cultures additionally from my travel and various projects with craft clusters in India (see 4.2.7). Initially I started to capture the everyday practices and associated products in the form of narrative to capture all the details about the objects. A lot of iterations and ways of writing were explored to structure these case studies. Subsequently, I revisited the research question and objectives, engaging in an interactive process to refine the structure by focusing on relevant information. The case studies were then restructured using the four main categories and their respective adapted subcategories within the QBL framework. Additionally, I attempted to compare traditional objects with their contemporary equivalents, although this presented challenges in readability and coherence.

But this process allowed me to preserve the details needed for each object and helped to finalise the structure using main categories, firstly to define what the object is, secondly to describe object's relevance in everyday life with social, economic, spiritual contexts along with brief history of each, thirdly to illustrate object's making process, then briefly comparing the traditional object with relevant contemporary equivalence and lastly summarising and analysing the object through the lens of QBL.

3.5.1.3 Interviews

This section describes how and why I expanded upon the autoethnographic approach described above by conducting interviews with Indian designers who work with traditional crafts. As the overall aim of this study is to generate insights into what contemporary product design can learn from traditional Indian products and practices, I chose to expand upon the insights gained from the autoethnographic studies by seeking third-party insights from Indian designers who work with traditional crafts. This aligns with the overarching case study approach adopted in this study, which allows data to be collected from varied sources.

The purpose of conducting interviews was to gain real-world perspectives from designers involved with traditional crafts to uncover their perceptions of working in this sector, especially in terms of their contributions to sustainability and where opportunities and barriers might lie. Furthermore, by incorporating third-party perspectives in this way, I hoped to bring a critical voice to the insights gained from my autoethnographic research to help discern what might be feasible in terms of making any recommendations for what contemporary product design might learn from traditional Indian products and practices. To this end, it was important to identify designers who were concerned with contemporary products rather than traditional craftspeople. Most of the designers are founders of various platforms like ecommerce websites,

firms, social enterprises, which support and redesign contemporary products using traditional Indian handicrafts as well as collaborate with craft clusters and craft artisans.

The recruitment strategy for interviewees was purposive and designed to identify and engage Indian designers who are actively involved in the intersection of contemporary product design and traditional crafts. This approach was essential for expanding the autoethnographic insights and obtaining diverse, real-world perspectives on the contributions of traditional Indian crafts to sustainability and contemporary design practices. The primary criteria for selecting interviewees were that they had to be designers working with traditional Indian crafts and involved in contemporary product design. Preference was given to those who have founded or are part of platforms such as e-commerce websites, firms, and social enterprises that support and redesign contemporary products using traditional Indian handicrafts. Candidates were identified through my professional networks, industry associations while working in handicraft sector in India.

Personalized emails or LinkedIn messages were sent to potential interviewees, explaining the purpose of the study and highlighting the relevance of their work to the research objectives. These messages included a brief overview of the research, the importance of their participation, and how their insights could contribute to the study. Efforts were made to ensure a diverse range of perspectives by including designers from different regions of India and those working with various traditional crafts.

Interviews were an ideal method as they encompass diverse approaches involving questions, prompts, and supporting materials that guide participants into a deeper exploration of the subject (Gray, 2014). Furthermore, interviews can be adapted to various needs, offering a blend of structure and flexibility (Kvale, 1994). Among the three primary types of interviews, namely unstructured, structured, and semi-structured (Neuman, 2011), semi-structured interviews occupy a middle ground. The latter provide a framework for the researcher to channel the conversation while allowing participants the freedom to share insights on pertinent topics (Edwards and Holland, 2013). Semi-structured interviews were therefore chosen to obtain focused and qualitative data.

A set of interview questions were developed (see Appendix 1), complemented by open-ended inquiries formulated both beforehand and in response to the evolving conversations. In total, six semi-structured interviews were conducted with each interview lasting approximately 50 to 60 minutes. Due to the designers being located in India, the interviews were conducted online using MS Teams and were audio recorded and transcribed later. Prior to the interview, each

participant was provided with an informed consent form detailing the research purpose, how the data would be used, and assurances of confidentiality and anonymity. It was emphasized that participation was voluntary, and interviewees could withdraw at any time without any negative consequences. During the interviews, pertinent messages and highlights were recorded in field notes. These notes served as a guide to ensure that the interviews stayed aligned with the research questions and provided a safety net to capture all necessary data. The interview questions evolved as the interviews progressed, adapting to the specific context and responses.

To provide clarity and transparency about the interview process, Table 7 summarizes key details of the interviewees. This includes information about their roles, the types of crafts they work with, and their professional affiliations. The table is presented to give an overview of the participants' backgrounds and how they align with the criteria established for this study.

Table 7 Details of Interview Participants

Pseudonym	Role	Craft/Design Focus	Affiliation Type	Work
Designer P1	Founder, Social Enterprise	Empowering women artisans, training in design skills	Social Enterprise	Home decor, jewellery, stationery, keychains, brooches, festive products (e.g., <i>rakhi</i> , Diwali décor), corporate gifting integrating traditional crafts with contemporary products.
Designer P2	Founder, E-commerce Platform	Contemporary home decor integrating traditional crafts	E-commerce Platform	Chandeliers, furniture, wall pieces catering to luxury markets, handcrafted copper tea light holders, and <i>Chitrakathi</i> art stationery gift hampers.
Designer P3	Industrial Designer	High-end furniture blending craft, design, sustainability	Design Studio	Handcrafted wooden chairs using bamboo weaving techniques, artistic pieces reflecting cultural heritage, suitable for modern and traditional homes.
Designer P4	Ceramics and Glass Designer	Contemporary lifestyle products using terracotta crafts	E-commerce Platform	Clay household products, festive decor, <i>Longpi</i> pottery kettles and cups, <i>Lippan</i> mud art wall clocks.

Designer P5	Product Designer, Studio Owner	Functional products blending traditional craft with innovation	Design Studio	Modular furniture with an Upgrade System for adaptability and longevity, minimizing waste, and blending artisanal techniques with industrial precision.
Designer P6	Start-up Founder	Revitalizing fading crafts with innovative designs	Start-Up	Bags, baskets, home décor products blending Scandinavian aesthetics and traditional Indian techniques.

By adopting this strategy, the study aimed to gather rich, qualitative data from designers deeply embedded in the practice of integrating traditional Indian crafts with contemporary design. This approach not only provided a critical voice to complement the autoethnographic insights but also ensured that the findings were grounded in practical, real-world experiences.

3.6 Data analysis

3.6.1 Thematic analysis

Most methodologists (J, 2002; Flick, 2014) suggest a two-step approach to data analysis, which involves initial sorting, indexing, and categorizing followed by a deeper phase of translation and interpretation. This second step demands critical, imaginative, and speculative thinking (Guba and Lincoln, 1994; Moalosi, 2013). Many researchers emphasize that data analysis is often an iterative process that unfolds throughout the research journey (Blaxter, Hughes and Tight, 2001). In this study, collected primary data underwent thematic analysis (Braun and Clarke, 2021), aligning with the method outlined by Miles and Huberman (2016), which encompasses data reduction, data display, and conclusion drawing to identify findings.

Analysis of autoethnographic data

Analysing autoethnographic data involved a nuanced process that integrates personal narratives with cultural analysis. Autoethnographic analysis is both a creative and analytical process, which required a balance between embracing the personal, subjective elements of the narratives and critically examining their cultural and social significance. I began by immersing myself in the collected autoethnographic narratives. I read and re-read the data to familiarize myself with the content, to identify the recurring themes, and significant insights. Then I employed open coding

to identify and label initial themes, and patterns within the narratives. Inductive reasoning was used to let the data guide coding process rather than imposing preconceived categories. Throughout the coding process I kept writing the reflective and analytical memos. These notes captured my thoughts, insights, and questions about the emerging patterns and connections within the data. After establishing the initial codes, I progressed to focused coding, grouping related codes into broader categories or themes that captured the core elements of the narratives. This iterative process involved continuously comparing new data instances against the existing codes and categories. Through this refinement, I was able to uncover deeper insights and situate the findings within the QBL framework, organizing them into meaningful subcategories.

Developing and implementing sub-categories for the QBL framework

I developed the subcategories for the QBL framework through a systematic process that combined insights from a literature review and empirical data from autoethnographic case studies. My research extends Walker's work by applying the QBL framework in the Indian context to analyse traditional products and practices. While Walker's framework provided a conceptual foundation for evaluating sustainability across practical, social, economic, and personal dimensions, I refined and adapted it to capture the cultural and contextual nuances of India's rich traditions.

I began developing the subcategories while preparing a conference paper for the ICON Arcade Conference, where I presented the first case study of the stone mortar and pestle. I coded and decoded elements of the traditional mortar and pestle, comparing them to a contemporary mixer grinder. I mapped these elements against design-for-sustainability parameters identified in the literature (see Appendix 4) and my autoethnographic observations. This mapping helped me evaluate how well the identified elements aligned with the QBL dimensions.

After presenting the conference paper, I reflected on and expanded the subcategories under the main QBL dimensions—practical, social, economic, and personal. I used Walker's work in 'The Spirit of Design: Objects, Environment and Meaning' (2011) as a key reference, particularly his conceptual design of a mobile phone (Walker, 2011, p. 134) and the design values for the QBL (Walker, 2011, p. 133), which outline considerations for each dimension.

I also examined scholarly works that applied the QBL framework to analyse craft practices and traditional enterprises (see, Zhan and Walker, 2017; Mullagh, Walker and Evans, 2019; Bin Mohamad, 2021; Zhang, 2022)). Using these sources, I refined the subcategories by applying

the insights gained from the mortar and pestle case study to other objects explored in Chapter 4.

I validated the preliminary QBL framework by drawing on the findings from Chapters 4 and 5, which deepened my understanding of traditional Indian products, practices, and designers' perspectives. I adjusted the subcategories to ensure that the framework comprehensively represented each QBL dimension. I further validated the refined framework through conference and departmental research presentations, ensuring its theoretical robustness and practical applicability.

I finalized the adapted QBL framework to provide actionable and accessible guidelines for integrating personal meaning alongside practical, economic, and social dimensions of sustainability. I demonstrated its application in Chapter 7 by designing the 'Willow Bed for Lancaster'. This design showcased how the adapted framework connects traditional practices with contemporary sustainable design.

To enhance transparency, I included developmental versions of the subcategories in Appendix 4, documenting the iterative refinement process. By contextualizing the framework to Indian traditions, I offer a replicable model for future researchers, bridging traditional knowledge and sustainable design practices.

Analysis of interviews

Similarly, for analysing interviews I started with the initial stage of data reduction and preparation. Interview recordings were transcribed in line with notes. Then I read the data iteratively, accompanied by note-taking, facilitating a deeper connection with the data. Data was initially organized by keywords and their corresponding descriptions, combining with key and summary notes. Moving on to the second stage, a coding process was initiated. Most codes emerged organically from the data through an inductive, data-driven process. The development of these codes involved critical and inductive comparisons, facilitated by methods such as Post-it notes and visualization. These techniques allowed for flexibility and enhanced the observability of patterns in the data.

Finally, in the concluding stage, the research findings were synthesized by identifying clusters, themes, and establishing relationships among them. This process laid the foundation for organizing and structuring the research findings into a coherent chapter.

3.6.2 Production of objects

In this research, I designed a contemporary everyday product by incorporating insights from traditional Indian products and practices, evaluating its alignment with sustainability principles. Utilizing an adapted QBL framework, which provides more actionable and accessible guidelines for integrating personal meaning dimension along with the practical, economic, and social dimensions of sustainability. I demonstrated this approach in Chapter 7 by designing the willow bed for Lancaster. A research-through-design approach was chosen for its ability to combine theoretical insights with practical application, providing a dynamic and iterative exploration of design solutions (Niedderer and Roworth-Stokes, 2007; Gaver, 2012).

The justification for using a research-through-design (RtD) approach lies in its capacity to merge theoretical knowledge with practical experimentation, allowing for an in-depth exploration of design solutions that integrates learnings from traditional Indian products and practices into UK context. RtD is particularly effective in this context because it treats design as a form of inquiry that generates actionable insights and refined solutions through the iterative process of making and testing (Niedderer and Roworth-Stokes, 2007; Gaver, 2012). This aligns with Cross's (2007) assertion that design practice itself can produce valuable knowledge that may not be evident through theoretical research alone.

The RtD approach enabled a comprehensive examination of how traditional Indian knowledge could be adapted to contemporary contexts. The design of the willow bed involved taking inspiration from the *charpai*, a traditional Indian bed, which provided valuable information on construction techniques, materials, and cultural significance. Willow was selected for the bed frame due to its historical importance and suitability for weaving in the UK (Carpenter, 2017), while Herdwick wool was chosen for its beneficial properties such as temperature regulation and hypoallergenic benefits (British Wool, 2022).

3.6.3 Ethics Approval

Ethical considerations and arrangements are one of the important aspects in the research process. Prior to commencing the semi-structured interviews, ethical clearance was obtained from the Faculty of Art and Social Sciences and Lancaster University Management School Research Ethics Committee of Lancaster University (see Appendix 1). This is the requirement of the University's Code of Practice, which all researchers need to follow before carrying out the data collection process. Approval was granted prior to the interviews being conducted.

However, beyond the administrative process of gaining ethical approval, several key ethical issues were carefully considered and addressed. These include:

Informed consent: Participants were provided with clear and comprehensive information about the purpose of the study, their role, and any potential risks. Informed consent was obtained from each participant, ensuring that they understood the voluntary nature of their involvement and their right to withdraw at any time without consequence.

Confidentiality and anonymity: To protect participants' privacy, all interview data was anonymized, and pseudonyms were used in reporting findings. Identifiable information was securely stored and only accessible to the research team. The data was handled in accordance with the university's data protection policies.

Sensitivity to cultural and social contexts: Ethical considerations also included being mindful of participants' cultural and social backgrounds. Efforts were made to create an open and respectful environment, where participants felt comfortable sharing their insights and that any questions posed were respectful and appropriate.

Impact of the research: The potential benefits and risks of the research were weighed, with a focus on ensuring that the findings would contribute positively to the field while minimizing any unintended negative consequences for participants or communities involved.

By addressing these ethical issues, the study aimed to uphold high ethical standards, ensuring that the research was conducted with integrity, respect for participants, and a commitment to producing valuable and responsible knowledge.

3.6.4 Validation of the Findings

Creswell (2007) and Guba and Lincoln (1994) state that qualitative research focuses more on validity to determine whether the account provided by the researcher is accurate, can be trusted, and is credible. Validity comes from the primary information collected and from the analysis of the research (Creswell, 2009). Over the course of the research, the data and the findings were validated through various methods. The accuracy of the data was checked with informants and participants during data collection in the field using these techniques:

- I constantly engaged in self-reflection to acknowledge own biases, emotions, and experiences that may influence data interpretation. Being self-aware allowed to address any personal subjectivity.

- After data collection and analysis, I shared findings and interpretations with interview participants and with individuals who shared similar experiences. This allowed them to provide feedback on the accuracy of my representation.
- I collaborated with supervisors who critically evaluated my work. Their feedback helped identify potential biases or inaccuracies in data and interpretations.
- I used a combination of personal experiences with external data or literature wherever was appropriate to cross-verify findings. This helped enhance the credibility.

After data collection, aspects of the analysis of the findings were validated and revised through methods, such as:

- Peer-reviewed conference and journal articles (see Declaration for the publication list).
- Presentations and discussions of research to supervisors, within department and at seminars.

3.6.5 Summary

The methodology chapter explains how this work employs a constructivist and interpretivist approach to investigate traditional Indian products and practices. Constructivism emphasizes the socially constructed nature of knowledge, making it a fitting lens for exploring how traditional craftsmanship embodies cultural and environmental values. Interpretivism complements this by focusing on understanding the subjective meanings behind these practices, aligning with the QBL framework to explore sustainability holistically.

The research employs case studies and autoethnography, with reflective journaling and imaginative exercises used to document daily life and categorize findings within sustainability frameworks. The QBL framework guides the analysis of case studies, integrating environmental, social, cultural, spiritual and economic dimensions of sustainability. Reflective autoethnographic practice enriches this understanding by incorporating the researcher's lived experiences, providing a nuanced perspective that aligns with constructivist and interpretivist paradigms.

Semi-structured interviews with designers offer external insights, which, when synthesized with autoethnographic data through thematic analysis, ensure a comprehensive understanding. This integration of subjective reflections with structured analytical methods underscores the reliability and rigor of the study. Ethical considerations ensure adherence to research guidelines, while validation through peer-reviewed publications and participant feedback reinforces the credibility of the findings.

The thesis seeks to bridge traditional Indian practices and contemporary design approaches to address sustainability challenges from a holistic perspective. The literature review identifies gaps in current sustainability frameworks, particularly their limited incorporation of cultural and traditional knowledge. The research objectives are crafted to explore and document these rich traditions and develop frameworks that integrate their principles into modern design. Rather than providing definitive solutions, this thesis offers an alternative perspective—encouraging incremental shifts in design practice while provoking radical changes in thinking. The frameworks aim to inspire designers, researchers, and communities to adopt culturally informed, sustainable practices as part of a broader movement toward meaningful and systemic change.

To summarize the structure of the research methodology, the following table provides an overview of the components, incorporating the constructivist and interpretivist roots in relation to the QBL framework and autoethnographic reflective practices.

Table 8 Research methodology overview

Category	Details		
Research paradigm	Ontology - constructivism / subjectivism	Epistemology - interpretivism	
Research approach	Research into design Research for design Research through design		
Purpose of the research study	Combination of exploratory, descriptive and explanatory		
Type of Data Collection	Qualitative		
Overarching research strategy	Case study (India as a case)		
Research phases			
Theoretical exploration (2020-2021)	Objective 1, 2	Methods - Literature review, notes	Approach - Research into Design
Data collection (2021 - 2022)	Objective 3	Methods - Autoethnography	
	Objective 4	Methods - Case study	
	Objective 5	Methods - Semi-structured interviews	
Data analysis (2022 - 2023)	Objective 6	Methods - Thematic analysis, Prototyping	Approach - Research for Design
	Objective 7	Methods - Prototyping	Approach - Research through Design
Validation	Conference presentations Peer-reviewed journal articles		

Chapter 4 Traditional Indian Products and Associated Practices

4 Traditional Indian Products and Associated Practices

4.1 Introduction

This chapter addresses the two research objectives:

RO 3: *To identify and document traditional Indian products and practices that are still relevant to contemporary lifestyles through autoethnographic case studies.*

RO 4: *To conduct a detailed analysis of selected traditional Indian products and practices to assess to evaluate their alignment with sustainability principles, including evaluations of materials, production processes, and lifecycle considerations, and to highlight sustainability aspects through comparative studies with modern equivalents.*

To identify the traditional Indian products and associated practices, the autoethnography method was used (See section 3.5.1.2). The autoethnographic process involved reflecting upon everyday life in rural India which is explained in section 4.2 of this chapter. From the narratives of rural life, I identified 6 traditional Indian products and associated practices, which are presented in section 4.3 and analysed through the lens of the Walker's (2011) Quadruple Bottom Line (see section 3.6.1). As a starting point, I drew from my lived experiences of growing up in India, recounting everyday activities and experiences in addition to personal and professional experiences gained while working in the handicraft sector. While describing day-to-day life in rural India and activities, I asked questions of the experience including 'what is it like to ...?' 'what did it involve ...?' 'what meanings and values are held ...?' (Poulos, 2021). This approach allowed me to form a narrative of everyday life in rural India and to recall the objects and products used and their associated meanings and values. Everyday traditional practices and products consisted of food preparation, cooking, food preservation, cleaning and bathing practices, furniture, textiles, etc. and the services and systems that revolve around these. While analysing these practices, questions including 'why?', 'who wants to know?' and 'how does this relate to the research questions and objectives?' supported the selection and justification of a range of six traditional practices and products to be investigated as individual case studies. The case study method has been used as the research sought to explore the 'what', 'why' and 'how' aspects of traditional Indian products and practices (as described in Section 3.4.2.3) The case study method allowed me to focus on specific objects in their context, while retaining the holistic and meaningful characteristics of real-life events (Yin, 2009). As part of the case study

approach, the selected practices and products were critically examined as case studies through applying Walker's (2011) QBL framework.

4.2 Everyday Life in Rural India

In Indian villages, towns and cities, each has its own pace and style of life. 65 percent of the population still lives in the villages of India (The World Bank, 2018; United Nations Department of Economic and Social Affairs, 2018). In these villages, many people engage in traditional occupations such as farming, pottery, carpentry, and blacksmithing, often influenced by the intricate Indian caste system. This system, rooted in ancient traditions, organizes people into hereditary groups with specific roles, defining their social hierarchy and occupation. Historically, villages were designed to be self-sufficient, guided by systems like the '*Bara Balutedar*' (twelve traders) system (Dandekar *et al.*, 2021). This hereditary barter system ensured that each village had a diverse range of skilled trades and services, creating a localized ecosystem where residents could meet their basic needs without traveling elsewhere. These occupations varied across different regions of India but typically included professions such as blacksmiths, carpenters, potters, barbers, weavers, washermen, oil pressers, and others. They were often hereditary occupations, passed down through generations within specific families or caste groups. The skills and knowledge required for these trades were typically acquired through apprenticeship and hands-on training. However, the *Bara Balutedar* system also had its drawbacks. It reinforced rigid caste-based divisions and limited social mobility. The system started to decline with the introduction of modern industries and technologies during the colonial era. However, remnants of this traditional system can still be found in certain pockets of the country, especially in rural areas where traditional trades continue to be practiced (Fukazawa, 1982).

In rural villages morning begins much earlier than in urban areas with the sounds of cows and buffaloes' milk squirting into metal pots, the sound of cow bells, the rustle of straw, the clatter of milk cans. Villagers live in houses made from mud or clay, which have thatched rooves made from straw or burnt clay tiles. This vernacular construction method differs region to region according to the weather to keep houses warm or cold with different materials being used. People living in Indian villages lead very simple lives and mostly depend on handmade and locally available products to fulfil their needs. People usually start their mornings with taking bucket baths and use natural cleaning luffas and shampoos. In the morning women decorate door fronts by drawing 'kolam/rangoli' using rice powder, to primarily feed insects outside of the home so they don't enter inside for food. Then they start preparing the meal, for which they

mainly use and depend on basic energy saving techniques and handmade local equipment and utensils such as 'Pata Varwanta (grinding stone & rolling pin)', 'Sil Batta (handmade mortar & pestle)', 'Madani (wooden churner)' etc. To cook food, they use handmade utensils including terracotta pots, brass and copper pans, and various stone and wooden wares. Food is served in plates made from leaves, terracotta or brass plates and they prefer to eat using their hands whilst sitting on the floor. It is a usual custom for women to grind fresh flour every day at home using a hand operated millstone while singing folk songs. They also use simple food preservation techniques like pickling and sun drying, etc. The majority of the Indian diet is plant based and food habits depend on locally grown and seasonal produce, which significantly reduces the need for preservation and transportation of food, which has a lower impact upon resource consumption. To prevent food wastage, many traditional recipes are used to recycle leftover and extra food e.g. Khakra, Curd rice, dal parathas, vegetable peel chutneys etc.

As we see with cooking practices, above, other domestic and household practices are also less resource intensive and meaningful. These include sweeping the floor, for which they use various types of brooms made from different types of grass for different purposes. Various types of grass and jute twines are used to make 'charpai' (beds made from a wooden frame and woven twine). These products are a source of livelihood for many people in almost all the villages, as they are handmade using locally available materials. Similarly, reuse and recycling of materials is prevalent and used in multiple art forms and crafts including 'chindhi craft' (mats, carpets weaved from old clothes), jute mats, coir fillers for cushions and mattress, blankets, bags and cushion covers. People depend upon traditional, resource effective mechanisms, not only for everyday domestic products, but also in terms of services. For example, services including 'dudhwala' (milkman), 'dhobi' (washer), 'istriwala' (ironing man), 'sabjiwala' (vegetables and fruits vendors), 'dabba-wala' (food delivery man), etc. continue to be part of their everyday lives. These services are great examples of sharing, leasing, co-ownership, trusting others, and importance of community. This is not due to poverty or having fewer options, but that people have a general inclination towards need-based consumption and an ingrained sense of responsibility which resists wasteful consumption and propagates respect for life. These attitudes result from the prominent spiritual and religious beliefs of India that promote an intimate contact and sense of belonging with nature, meaning people consider themselves to be part of nature (Ehrenfeld, 2008). These behaviours can be seen in Hinduism, where all living things and non-living things are situated within various gods and goddess. Therefore, people worship not only living things like plants and animals, but also non-living things like brooms and tools (Rautela, 2015). For example, on the day of Ayudha Pooja, the annual festival at which

craftsmen honour the tools of their trade (Sundara Ramaswamy, 2009). Similarly, the 'jhadu' (broom made of grass) is situated with the goddess of wealth 'Lakshmi', so on Diwali people worship the broom and sweeping every evening with the 'jhadu' is an important custom in many households.

4.3 Traditional Indian products and associated practices

The following section presents six case studies, each highlighting a traditional product:

1. *Charpai* – Woven Bed
2. *Lakshmi Jhadu* – Grass Broom
3. *Dhurrie/Chindi* Rug
4. *Patravali* - Leaf Plates
5. *Matka* - Earthen Water Pot
6. *Sill Batta* - Mortar and Pestle

Each component of case study begins by introducing the product, followed by an exploration of its significance in everyday life, encompassing associated practices, social, spiritual, and economic relevance. The subsequent section explores the manufacturing process, detailing materials used and techniques employed. Furthermore, we examine the sustainability of these traditional products compared to contemporary equivalents. Lastly, the case study components are analysed using an adapted version of QBL. The development of sub-categories for the adapted QBL framework was grounded in the literature review and empirical data from autoethnographic case studies, aimed at integrating personal meaning alongside practical, economic, and social dimensions of sustainability. Initially, sub-categories were iteratively developed while working on a conference paper comparing the traditional mortar and pestle with contemporary mixer grinders, evaluated against sustainability parameters (see section 3.6.1 and appendix 4).

4.3.1 *Charpai* – Woven Bed

4.3.1.1 What is a *charpai*?

Charpai - 'Char' means four and 'pai' means feet. It is a light weight rectangular wooden bed with a woven surface and four legs. It is one of the most economical and multi-functional pieces of furniture which is indigenous and unique to India.



Figure 9 Charpai

The *charpai* is a simple framed structure made mostly of wood. A typical *charpai* has four beams and four legs that are joined together with tenon and mortise joints. The seating surface is made using the rope webbing method.

For a typical *charpai* the makers follow the same techniques that have been employed by generations in particular regions. They are made in different sizes, designs and weaving patterns. The skill of making it has passed down through generations. Traditional *charpai* are made using natural materials, such as different types of wood depending on the regional availability and ropes made from natural fibres to make the webbing patterns. The making of the *charpai* allows for a wide variety of shapes of legs and webbing, depending on the regional local materials. It does not need much space and can easily be shifted from one place to another, making it compact, storable and portable. Compared to modern and contemporary beds the *charpai* is more, economical, ecological, and easier to repair.

The *charpai* typically has a firm surface due to the tight webbing, which can provide support for the back. Some individuals find the firmness of the *charpai* to be beneficial for maintaining good posture and relieving back pain. Depending on individual preferences and specific conditions some people use *godhadi* (handmade/handwoven mattresses) for extra cushioning and comfort.

4.3.1.2 The use of *charpai* in everyday lifestyles, social, economic, spiritual contexts

Charpais are used as part of everyday life in Indian villages and they are a multifunctional product in rural households. During the day it is used for resting and at night for sleeping. At night a *godhadi* (handmade/handwoven mattress) is kept on it for extra comfort. People also

use the beams of the *charpai* by tying and hanging a piece of cloth for putting a baby or new born to sleep.

During the day-time, women use the *charpai* as seating for many purposes such as preparing food items, helping each other and talking. When they are otherwise unoccupied they use it to rest during the day time. During the summer, food is sun dried by placing it on a surface that is created by spreading a long piece of cloth across the *charpai*. The dried food will be preserved and stored to consume throughout the year. Men use *charpai* as day beds in their farms or at their place of work to rest. In my autoethnographic notes, I recorded *“my grandma always used it dry the homemade candy made with fresh mangoes in summers”*

When not in use, a traditional wooden and rope *charpai* may be moved to an unoccupied space of a dwelling. It can also simply be leaned against a wall. Being mobile and lightweight, it can be carried to wherever necessary. In the villages of India there is always at least one *charpai* maker. In many households *charpai* frames are used for generations with some repairing and replacing of the webbing material from time to time. The natural materials of traditional *charpai* will gradually wear, fade, break down and return to the earth as part of the natural cycle. Afterwards, remaining webbing material is used as small ropes to tie small bags, also used by shopkeepers selling grains to tie bags or also converted into ropes to air-dry cloths. The wooden frame is sometimes used as fuel for fire for cooking or during winters or they gradually biodegrade in nature.

In rural India the *charpai* is used for various purposes in addition to a bed. Other uses include as a symbol of social activities where it is also used when households have guests or visitors. During social visits an elder person is offered a seat on the *charpai* as a sign of respect, and youngsters sit on a mat on the floor. It is also gifted to a daughter during her wedding. It is used widely in *dhabas* (restaurants on highways) for travellers in rural areas as a place to eat food and rest on it later. To eat food on the *charpai*, an extra wooden plank is placed on the longer beams, creating a flat hard surface to place the food, and after finishing the food that plank is removed so the traveller can rest on it.



Figure 10 Women doing home chores sitting on charpoy and piece of cloth is hung for baby to sleep in



Figure 11 Charpai in use to sun-dry food on the roof

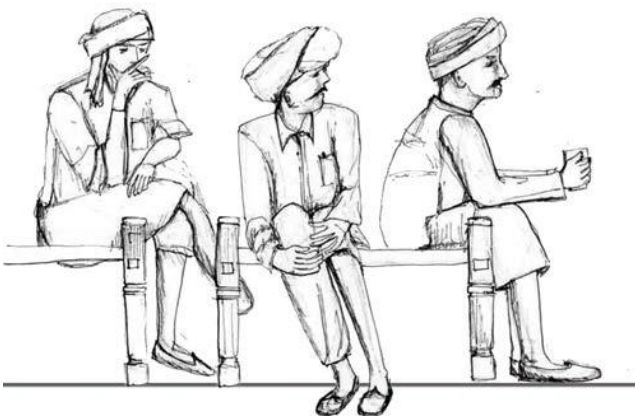


Figure 12 Men sharing charpai for sitting and socialising

4.3.1.3 Making of the charpai

Charpai tend to be approximately 6ft by 3ft, but can differ according to the availability of wood. For a typical *charpai* the makers follow the same techniques that have been employed by generations in particular regions. Traditional *charpai* are made using natural materials, such as different types of wood depending on the regional availability and ropes made from natural fibres to make the webbing patterns. The making of *charpai* involves two types of skills: carpentry work to make the frame and weaving work to make the webbing pattern. Carpentry work is usually carried out by male artisans or carpenters and webbing and weaving is done by both women and men. The traditional *charpai* frame lasts for years, however over time the webbing may get saggy, in which case the ropes can be tightened or webbed with new material while keeping the old frame intact, making it easy to repair. The appearance of the *charpai* is vernacular, with a wide variety of shapes of legs and webbing, depending upon regional local materials. It does not need much space and can easily be shifted from one place to another, making it compact, storable and portable.

The *charpai* making process has three main steps. The first step involves the making of the legs, which are either turned with a manual lathe machine or hand carved. Then comes the making of the beams for the side of the frame. The thickness of the side beams and legs stay proportionate to the overall form. The beams and legs are joined together using the tenon and mortise joint. Then the webbing for the seating element is done using thin rope of various materials which depend upon regional local materials like grass, coir, cotton ropes or recycled old fabric ropes and craftsmen's skills. The weave patterns must be strong enough to increase the stability of the frame, to hold the weight of those sitting or sleeping on it; by these criteria there are certain weave patterns that are more successful than others. Traditionally the ropes are woven in a cross weave for the most part, leaving a narrow section of 'warps' at one short end and tied off in such a way that they can be adjusted to control the sagging of the net over time. Webbing could be done in one, two or in more colours. Many forms of lattice, criss-crossing, diamond, double diamonds, herringbones and plaiting, basket weave patterns can be seen. Later on, either it is sold or more decoration is done such as lacquer work or metal inlay on legs etc.

4.3.1.4 Environmental sustainability of the *charpai* today

Whilst the basic design and form of beds around the world have remained consistent, materials and making processes for beds and mattress have changed drastically due to industrialisation and technological advancement (Fagan & Durrani, 2019). Today most beds are mass produced in various synthetic materials and many production units for different component parts of beds

and mattresses are spread all over the world and sold globally (Cordella and Wolf, 2013). Mattress disposal in the US alone sees 20 million mattresses thrown into landfills every year and just one mattress can take up 40 cubic feet of space (Blanchard, 2021). Besides space, mattresses that make their way to landfills also present a host of other issues (Tarantino, 2019). As mattresses are difficult to compact, landfill workers often have to use special equipment to break them down. This process can cause issues with equipment as the springs inside the mattress can pop out and cause damage. Breaking down these mattresses also creates a larger carbon footprint due to the energy required to get them ready for the landfill (Cordella and Wolf, 2013). Many mattresses are made from petroleum-based products and constructed using toxic chemicals which can also have a negative impact on the environment if they end up in a landfill. When these chemicals seep into the ground, they can cause soil and water pollution (Tarantino, 2019). If we look at the lifecycle of modern and contemporary beds and mattresses, right from resource extractions to final product assembly and from consumption to end of life, a lot of resources are being used and there are negative environmental impacts (Russell & Allwood, 2008).

To counteract the mass production of beds, some more sustainable products are being made. 'Herdysleep Mattresses' in UK, combine responsibly sourced natural materials (Herdwick wool) with traditional craft methods and innovative technology (The Herdy Company Ltd, 2023a). These products support farmer cooperatives by buying wool at fair trade price and use carbon neutral manufacturing processes, making mattresses fully recyclable. As described above, the *charpais* are made using locally available natural materials with minimal tools and production facilities and consumed locally. In many households *charpai* frames are used for generations with some repairing and replacing of the webbing material from time to time. When the *charpai* wears, the natural materials of traditional *charpai* will gradually wear, fade, break down and return to the earth as part of the natural cycle; and as part of this process homes and food are provided for many tiny creatures. However, *charpai* production is still rooted within traditional societal structures and roles e.g., men being carpenters, women weaving. Often use of the *charpai* and many other objects revolves around casteism, gender inequality, classism etc. e.g., when the man of the house is present, the woman sits on the ground, while the man sits on *charpai* or if a guest is from lower caste he sits on the ground or on a mat.

4.3.1.5 *Charpai* through the lens of adapted QBL

The following table presents a summary of key points of the above sections into the adapted categories of QBL.

Table 9 Charpai through the lens of adapted QBL

QBL Dimensions	Adopted categories	Summary of <i>charpai</i>
Practical Meaning: utilitarian needs and environmental consideration.	Practical application	<ul style="list-style-type: none"> Handmade <i>charpai</i> serves multiple purposes such as: Day bed, night bed, socializing spot, food drying surface, eating surface, etc.
	Materials	Commonly made using: <ul style="list-style-type: none"> Locally available wood for the frame. Webbing materials include cotton ropes, jute, hessian, abaca, coconut fibre, agave, date palm, etc.
	Manufacturing	<ul style="list-style-type: none"> Construction begins with a wooden frame (four side beams and legs) joined using mortise and tenon joints. Webbing involves using various locally available natural fibre ropes, with styles reflecting vernacular traditions.
	Energy usage	<ul style="list-style-type: none"> Minimal energy use, such as for lathe or wood-turning machines.
	Longevity	<ul style="list-style-type: none"> Lifespan varies; some <i>charpais</i> last for years or generations. Webbing may need periodic tightening or replacement.
	Maintenance and repair	<ul style="list-style-type: none"> Requires no special maintenance. Loose webbing can be tightened or replaced.
	Disposal	<ul style="list-style-type: none"> Wood is reused as fuel for cooking or heating. Webbing ropes are repurposed for tasks like tying bags or hanging clothes until they degrade. Made of natural materials, it biodegrades gradually.
Personal Meaning: inner values, conscience, spirituality.	Self-expression	<ul style="list-style-type: none"> Makers express themselves and gain a sense of identity through hand-making. Buyers develop pride in traditional practices and bond with the product due to its manual use.
	Historical significance	<ul style="list-style-type: none"> <i>Used in India for over 5000 years; still prevalent in rural areas (Design Innovation and Craft Resource Centre, 2017).</i>
	Ceremonial use	<ul style="list-style-type: none"> <i>Traditionally gifted to daughters at marriage.</i> <i>Plays a role in social gatherings, household functions, and childbirth rituals.</i>
	Spiritual values & beliefs	<ul style="list-style-type: none"> Integrated into daily rituals, from birth to death: Childbirth often occurs on a charpai. The term '<i>khatiya khadi karna</i>' reflects its use in mourning rituals.
	Health benefits	<ul style="list-style-type: none"> Woven surface maximizes ventilation, preventing heat and moisture issues during sleep. Firm yet flexible support helps with back pain. Firmness can be adjusted with additional blankets.
Social Meaning: community, compassion, equity and justice.	Local culture	<ul style="list-style-type: none"> Hundreds of varieties exist, reflecting diverse communities and vernacular techniques using local materials.
	Community	<ul style="list-style-type: none"> Builds a sense of belonging through local knowledge and skills exchange. Serves as a social and political meeting space in villages.
Economic Means: financial viability and ethical income generation.	Livelihood & Job creation	<ul style="list-style-type: none"> Entire families engage in charpai making, often as their primary income source. Supports the local economy through the sale of handmade products.
	Ensuring the other three elements of the QBL are fulfilled	<ul style="list-style-type: none"> Promotes sufficiency and meaningful, long-term consumption. Discourages unsustainable profit-driven practices.

4.3.2 Lakshmi Jhadu – Grass Broom

4.3.2.1 What is a Lakshmi Jhadu?

The *Lakshmi Jhadu* is a broom made from natural fibres such as grass and thin, long leaves of certain bushes and plants. This broom is often regarded as feminine and is associated with the ‘Goddess of wealth’, *Lakshmi*. In rural India, it is the first thing that a woman of the house picks up at the break of the dawn, to clean the courtyard and the porch.



Figure 14 *Lakshmi jhadu* made with soft grass



Figure 13 *Lakshmi Jhadu* made with hard sticks of bush

4.3.2.2 The use of *lakshmi jhadu* in everyday lifestyle as well as in social, economic, spiritual contexts

Sweeping the floor first thing in the morning and before the dawn is considered a sacred activity in Indian households. In rural India, many households still use brooms that are made locally from natural fibres. Materials, hardness, sizes and length of the broom depends on the utility and area which needs to be cleaned. To brush aside dust from smooth floors, a broom with fine strands is used. For sweeping water or other fluid materials, a broom with thick and stronger strands is used. For sweeping pliable areas such as grass or open land, a broom with branched strands is used. Manually cleaning the floor with this natural fibre broom is also believed to be a healthy practice. When sweeping the floor, one needs to bend and stretch the body, which allows you to be more flexible.

In India, the *jhadu* is also used for *jhadna*, which is not just physical dusting but aura dusting, the removal of *nazar* (other negative influences on ‘non-physical’ body). This is an occult belief, widely prevalent in India. “Whenever I fell sick or got lots of appreciation from people around, grandma would use broom and chant some mantras and pray that I don’t get affected by any negative influences”. Mothers usually insist on *jhadna* for their children. The broom used for this is often made using peacock feathers which have an ‘auspicious’ eye-like pattern. Brooms made of horsetail or yak-tail are also used for this purpose.

A broom also has a religious significance. In Hindu mythology, a broom made up of natural fibres is often associated with goddess *Lakshmi*, who is goddess of wealth. During Diwali festival buying brooms and worshiping it is believed to bring good luck, wealth, and prosperity (Tiwari, 2023). It is said that the goddess *Lakshmi* is attracted to clean homes, so it is important to keep the broom in a particular position so that its shape is not ruined, and people should not touch it with their feet as to not dishonour the goddess. In *Jainism*, monks and nuns keep a broom with them to keep out insects and animals from their paths as they walk. This prevents killing them unconsciously and is considered as an act of non-violence. The goddess '*Sheetala*', worshipped in Hinduism, Buddhism and some tribal cultures holds a broom in her right hand. She is a goddess associated with the smooth transition of seasons and prosperity. In some cultures, brooms are used by 'Tantric healers' to cure psychic problems (again the symbolism of warding off mental dirt). It is said that a broom gets attached to the place it sweeps and so; to respect its sanctity and its relationship with the place, the owner never takes it along when moving places.

However, it is worth noting that long with certain superstitious and religious significance brooms also have strong relevance in terms of casteism and politics in India, which may contribute to negative perceptions or practices (Gupta, 2022). For example, in some communities, using a broom or handling a broomstick is considered a lower-caste occupation or also untouchables in some cases (Gupta, 2022). This social stigma is a result of historical divisions and discriminatory practices, where certain tasks related to cleaning and sweeping were assigned to specific lower-caste groups. While societal attitudes are gradually changing, remnants of this stigma may still persist in some areas. Additionally, in certain regions or cultural beliefs, brooms are associated with superstitions or considered inauspicious. For instance, sweeping during specific times or in specific directions may be believed to bring bad luck or sweep away prosperity. These beliefs can vary across different communities and regions in India. However, efforts are being made to challenge social stigmas and promote equality and inclusivity in various aspects of Indian society, including labour and occupation divisions.

With changing technology, different forms of cleaning equipment like hose pipes and vacuum cleaners are now used. However, the broom continues to remain pivotal to the process of cleaning in India.

4.3.2.3 Making of the lakshmi jhadu

For an object as simple as a broom, Indian craft communities have created more than a hundred vernacular varieties, utilizing different plant species and construction techniques. India

is home to 537 aboriginal tribe communities and every community has their long-established methods of living in harmony with surroundings by valuing, preserving, and using wild forest resources to their benefits (Gaatha, 2014). Several wasteland species and seasonal grasses are used for making brooms. In some regions, waste materials from the harvest, including fine twigs, hay, straw, or plant leaves are also used. Material for making brooms changes with usage and area of application. For example, to clean the dust from indoors a small and soft broom made from grass is used, to clean the wet bathrooms brooms made from thick and stiff twigs/branches are used.

The basic process of making a broom starts with procuring grass or twig strands of approximately the same length. These are then formed into a bundle and tied together from one end. To increase the gripping comfort, around one fifth of the holding side of the broom is wound with thread or dried grass strips and tied. The process involves various simple tools, which are used to cut, slice or shred the base straw into finer lengths.



Figure 15 Tools used for making grass brooms (Source: Gaatha Website)

Several innovations have been developed to make brooms aesthetically more pleasant and robust in construction. In the central region of India, artisans make brooms with palm leaves. The leaves are shredded with a toothed tool and then two or three shredded lengths are joined by braiding. The resulting broom is quite unique in its form with braided strands throughout its length.



Figure 16 Different types of braids to tie the brooms (Source: Gaatha Website)

4.3.2.4 Environmental sustainability of the *lakshmi jhadu* today

With increasing dependence on plastic, the material compositions of the brooms have changed. Due to the decline in availability of handmade traditional brooms in India today, brooms and brushes are made from synthetic fibres and plastic handles are widely used in urban areas. The adoption of synthetic brooms in India can be attributed to several factors. Synthetic brooms are mass-produced and widely distributed, making them easily accessible to consumers in urban areas. There has also been a decline in the use of traditional materials as synthetic bristles are less prone to breakage and can retain their shape for a longer period. This means synthetic brooms may last longer than traditional brooms made from natural materials. The popularity of synthetic brooms in India can also be attributed to the influence of Western cultures and modern lifestyles. Synthetic brooms are often associated with urban living and modern homes, appealing to those who aspire to a contemporary lifestyle.

Traditional brooms made from natural fibres are made locally from locally available grass and shrubs. Local networks and communities are involved in the making and use of brooms. For example, farmers can earn a little bit of extra money by selling raw materials to communities who make these brooms. Communities make the brooms locally and sell them in a village. After their use, the grass is in some cases fed to cattle, left to natural degradation or disposed through composting.

Many households in urban India now use vacuum cleaners instead of brooms. If we compare the energy consumption of vacuum cleaners with traditional manual brooms made from natural

materials, there are number of advantages for using the manual brooms. Firstly, brooms can take care of most small messes by the time the vacuum has been plugged in. Secondly, with a broom, there is no need to worry about battery life, electricity usage or finding a wall plug. Thirdly, brooms store away quickly and don't have many parts, and they require no setting up thus no energy consumption. The major difference between traditionally made brooms and synthetic brooms or vacuum cleaners is the way they have been manufactured. To make brooms from natural fibres, minimal and simple manual tools are required, and makers usually make these brooms at their home so it does not require any manufacturing unit or additional energy and resource usage. In contrast, the manufacturing of synthetic brooms and vacuum cleaners involves resource use and detrimental impacts on environment at every stage (Gallego-Schmid *et al.*, 2016). Whilst contemporary vacuum cleaners highlight issues with manufacturing and energy usage, which are unsustainable, they also have clear value in their use. For example, for someone with mobility or accessibility issues, an electric vacuum cleaner or robotic vacuum cleaners which are lightweight and cordless might help in cleaning the house. Additionally, vacuum cleaners can penetrate deep into carpets and upholstery, extracting dirt and allergens that may not be easily removed with a broom. However, vacuum cleaners can be more expensive than brooms and they are bulkier than brooms and require more storage space. As houses in urban areas tend to be smaller they are often without much storage space. Vacuum cleaners also require regular maintenance, such as filter cleaning or replacement, which adds to the maintenance effort.

4.3.2.5 *Lakshmi jhadu* through the lens of adapted QBL

The following table presents a summary of key points of the above sections into the adapted categories of QBL.

Table 10 Lakshmi jhadu through the lens of adapted QBL

QBL Dimensions	Adopted categories	Summary of <i>Lakshmi Jhadu</i>
Practical Meaning: utilitarian needs and environmental consideration.	Practical application	<ul style="list-style-type: none"> Handmade brooms are used for sweeping floors.
	Materials	<ul style="list-style-type: none"> Made from wasteland species, seasonal grasses, harvest waste, fine twigs, hay, straw, and plant leaves. Material varies by usage and application.
	Manufacturing	<ul style="list-style-type: none"> Strands of similar length bundled and tied. Grip is enhanced by winding thread or dried grass strips. Simple tools used to cut and shred straw.
	Energy usage	<ul style="list-style-type: none"> Fully handmade, requiring no energy for manufacturing or use.
	Longevity	<ul style="list-style-type: none"> Lifespan ranges from 4-6 months, depending on use.
	Maintenance and repair	<ul style="list-style-type: none"> No special maintenance required; loose ropes can be manually tightened.
	Disposal	<ul style="list-style-type: none"> Natural materials biodegrade naturally.
Personal Meaning: inner values, conscience, spirituality.	Self-expression	<ul style="list-style-type: none"> Makers express creativity and identity. Buyers appreciate traditional practices and bond with the product.
	Historical significance	<ul style="list-style-type: none"> Centuries-old practice of broom usage in households.
	Ceremonial use	<ul style="list-style-type: none"> Ritualistic connection with Goddess Lakshmi; worshiped during Diwali. Symbolic in festivals and rituals.
	Spiritual values & beliefs	<ul style="list-style-type: none"> Religious significance in Jainism and Hinduism. Associated with Goddess <i>Sheetala</i>, revered in Hinduism, Buddhism, and tribal cultures.
	Health benefits	<ul style="list-style-type: none"> Natural brooms avoid harmful micro-particles. Sweeping promotes physical activity, metabolic fitness, and muscle strength.
Social Meaning: community, compassion, equity and justice.	Local culture	<ul style="list-style-type: none"> Over 100 varieties crafted using diverse plants and vernacular techniques (Design Innovation and Craft Resource Centre, 2017).
	Community	<ul style="list-style-type: none"> Builds community bonds through local knowledge exchange and product trade.
Economic Means: financial viability and ethical income generation.	Livelihood & Job creation	<ul style="list-style-type: none"> Family-based profession; primary income source. Demand peaks during festivals, supporting local economies.
	Ensuring the other three elements of the QBL are fulfilled	<ul style="list-style-type: none"> Encourages sufficiency, meaningful consumption, and sustainability over profit-driven practices.

4.3.3 Dhurrie/*Chindi* Rug

4.3.3.1 What is a dhurrie/*chindi* rug?

In India, the most common meaning for *chindi* is 'torn cloth'; consisting of end-of-life residue of fabrics in households. For generations this form of textile waste, torn strips of cloth, has been repurposed as colourful twine for tapestry or household craft projects, or hand woven into floor mats and wall hangings from very small to very large. *Chindi rug/dhurries* are thick, flat floor coverings or rugs that are woven with spun cotton yarn and textile scrap from old clothes and can be identified by their bold stripes in solid colours. *Chindi rugs* originate in India and its surrounding regions. These rugs are mostly produced in Maharashtra and Uttar Pradesh but are also made in certain parts of Madhya Pradesh and in some other parts of India. There are accounts of the *chindi rugs* floor coverings throughout the country, dating all the way back to the 13th century (Census Operations Uttar Pradesh, 1989). It was commonly thought for a long time, due to its practical and long-lasting nature, that dhurrie rugs were made for and used in poorer homes. However, one of the earliest depictions of the rug is found in a painting, of King *Mahajanaka* standing on a plain Indian dhurrie (Le Tattva, 2021). Throughout history these rugs have been used and cherished by commoners and royals alike (Census Operations Uttar Pradesh, 1989). A distinctive feature of this rug is its weave, comprising a weft of spun yarn and a warp of unspun, shredded fabric, known in Hindi as *chindi*. *Chindi rugs* are made entirely with fabric scraps through the process of braiding, coiling, and stitching without pile backing, which makes them reversible and lightweight. Due to their tight weave, *Chindi rugs* tend to be durable and easy to maintain. There are many different types of *Chindi rugs* ranging in style, technique, and pattern. They can be simple and minimalistic to extremely colourful and printed with intricate patterns. Commonly domestic cotton textile waste and hand spun cotton yarn is used to make these rugs. However, old cotton clothes are getting replaced by synthetic clothes or even with plastic wrap waste.



Figure 17 *Chindi* rugs

4.3.3.2 The use of *chindi* rug in everyday lifestyle as well as in social, economic, spiritual contexts

In Indian households, different types of rugs are used for different purposes. For example, small rectangular rugs are used as door mats, small square rugs are used as mats to sit on and eat a meal, bigger rugs are used as carpets in common rooms, bedrooms etc., They are also used for sleeping on the floor or for welcoming guests. The thickness of the mats differs and so does their use. For example, thin ones can be used as coverings for fruits or other items and thick ones can be used as a mattress or mattress topper which is used on *charpai* beds during winters. Many households in rural India sit on the floor to have their meal, using square *chindi* mats to sit. Numerous Indian traditions have rituals and customs associated with *chindi*, and those practices have an in-depth connection with the physical and psychological wellbeing of a person. Sitting cross-legged on the floor to eat food is one such practice that has been in prominence in India for a long time. According to *Ayurveda* and *Yoga*, these poses help improve digestion, blood circulation and flexibility. These rugs are also used as playing mats for children and babies, women also use them to sit on during household chores like cleaning vegetables, or use them to take afternoon naps, as rugs can easily be rolled up and put away when not in use, providing a spacious, clutter-free environment that is easy to maintain. They are also used as prayer mats by many communities. More elaborate rugs were gifted as wedding dowries, made by mothers and grandmothers with their hopes and wishes. Many communities used to use thick *chindi* mats for childbirth and during the funeral to keep the dead body. The mat was later burnt along with the body or used as burning fuel to avoid spread of diseases.

In rural areas, making these rugs involved certain vendors and makers locally. Traditionally, local utensil vendors would go door to door and barter old clothes for new utensils. Households would also save all old clothes to barter them for new utensils. The utensil vendors would then sell the old clothes to community members, who would turn them into strips and sort them according to colour. The strips would then be spun to make rolls, braids, or ropes of strips. Other particular community members hand spun the cotton yarn and then the raw materials would be bought by weavers to make the rugs. These weavers are mostly women who make *chindi* rugs in their leisure time at home while managing household activities. In addition to rugs they also make various products like bags, mats, coasters, baskets etc. using the same materials and technique. Historically, particular households used to commission a customised rug, and would often consign old clothes directly to the weaver with particular requirements. It was

then the weaver's job to get those old clothes converted into the raw materials and deliver the customised rugs.

Although the dhurrie rug has been around for few centuries, it was not until recently that they have come into the spotlight as a contemporary, stylish piece for the home. With increased demand, traditional ways of making these rugs are slowly changing. Industrial textile waste is now used as a raw material, hand weaving is getting replaced by machine weaving. The local ecosystem of barter trade is being replaced by imports and exports of raw materials and finished products. However, traditional *chindi* rugs are more resilient in nature, as they are made from braided strips which gives them a rugged nature. This lets them withstand a lot more wear and tear before wearing out. Therefore, they last a long time without much care. Furthermore, these rugs do not require special care, so can be washed without disintegrating.

4.3.3.3 Making of the *chindi* rug

As mentioned above, in rural India the making of *chindi* rugs involved a number of local communities at various stages. After the old clothes are cut into long uniform stripes and sorted according to the colours, there are several methods and types of weaving used depending on type of product, size of rug etc. Trade stages and making steps of traditional *chindi* rugs are explained briefly below:

Utensil Vendors – vendors used to wander door to door approaching households to sell handmade utensils in exchange for old clothes. As they used to visit households in village regularly they developed a relationship with them. They haggled and persuaded families to give away more clothes to strike the best bargain.

Sorting and twining – old clothes then sold by utensil vendors to members of a *waghri* community (a nomadic community - who have been operating informal, often invisible old-clothes recycling trade) sorts the clothes according to colours, then they would cut them into longer stripes of certain thicknesses to make certain types of ropes and braids by hand. Sorting and cutting was majorly done by men and braiding and twining was majorly done by women in the family.

Spun cotton yarn – then they spin the cotton yarn by using hand spinning wheel. This cotton yarn was used as wrap along with unspun weft (old fabric stripes).

Weaving – to weave the *chindi* rug the tool called *panja* (hand like instrument with five tines or prongs) is used, which keeps the yarns tight while weaving on a hand loom. The wrap is

stretched between the two horizontal beams, which can be adjusted according to the size of rug required. The *chindi* is inserted in wrap yarns with the fingers according to a pattern or design. These can be easily produced in different sizes, colours and patterns.

4.3.3.4 Environmental sustainability of the *chindi* rug today

Chindi rugs are a good example of upcycling, recycling, reusing and reducing domestic waste. Traditionally *chindi* rugs were made using the cotton and natural fibre cloths as that is what people used to use for daily wear cloths, however with time rugs made using old synthetic and fast fashion cloths has become a big informal cottage industry in India. Additionally, the majority of mass-produced carpets, rugs, mats and other floor covering have very different making processes. They are often made from synthetic and toxic fibres like nylon, polypropylene or polyester (Mohsen Mirafteb, Horrocks and Woods, 1999). There are various impacts of synthetic floor coverings which occur throughout their lifecycles. Health and environmental concerns associated with synthetic floor coverings include indoor air quality, chemical emissions from manufacturing and disposal operations and solid waste impacts etc (Tuomainen *et al.*, 2004). Additionally, nylon, polypropylene or polyester, all of which are durable and resilient fibres, are derived from petroleum and crude oil. Crude oil extraction not only produces an extremely potent greenhouse gas, but also the manufacturing process for nylon uses large amounts of water and energy (The Council of Fashion Designers of America, 2016). The negative environmental impact does not end with the production of synthetic fibres (Mihut *et al.*, 2001; Sim and Prabhu, 2018). These synthetic fibres are not biodegradable, and billions of kilograms of floorcovering are added to landfills worldwide every year, where they remain in the landfills for decades. Furthermore, the bulky nature of these floorcoverings creates collection and handling problems for solid waste operators, by using more resources to discard it and the variety of materials present in carpet makes it difficult to recycle (Sim and Prabhu, 2018).

Other contemporary floor coverings are more sustainable, such as carpets made from recycled plastic, rugs made from natural materials like animal hair or natural fibres using natural dyes e.g. handmade rugs made from the Herdwick sheep wool with natural dyes. However, handmade rugs or made using handlooms are very limited now: today many rugs made with sustainable materials are widely made at industry level. There are some challenges associated with these, such as high cost of using sustainable materials and the process of making those rugs is at industrial level becomes resource intensive, having negative impacts on environment at different stages of manufacturing (Sim and Prabhu, 2018). However, nowadays *chindi* rugs

are also made from old synthetic cloths as well, synthetic fabrics which are harmful to the environment. *Chindi* rugs made from domestic cotton waste do not have these detrimental impacts on the environment. They are made locally and consumed locally, and during the whole production lifecycle, minimal to no energy is used as they are completely handmade. Manufacturing also does not require many resources, and as they are made inside of the homes with minimal and simple tools, they do not require additional dyeing or finishing making them more efficient. They are durable due to the way they are made and need minimum care thus reducing the use of resources. Additionally, as the rugs are mostly made from natural materials, at the end of life it can be composted naturally. In many cases, the remains of the rug are used as small tying ropes for various purposes or also used as fuel for fires.

4.3.3.5 *Chindi* rug through the lens of adapted QBL

Following table presents a summary of key points of above sections into adapted categorised of QBL.

Table 11 Chindi rug through the lens of adapted QBL

QBL Dimensions	Adopted categories	Summary of <i>chindi</i> rug
Practical Meaning: utilitarian needs and environmental consideration.	Practical application	<ul style="list-style-type: none"> Handmade rugs serve various purposes, including floor coverings, sleeping mats, hosting guests, and playing.
	Materials	<ul style="list-style-type: none"> Made from domestic cotton textile waste, hand-spun cotton yarn, or synthetic/plastic wrap waste in modern times.
	Manufacturing	Multi-community process: <ul style="list-style-type: none"> Gathering old clothes. Converting clothes into braids. Hand-spinning cotton yarn. Weaving braids and yarn on handlooms.
	Energy usage	<ul style="list-style-type: none"> Completely handmade with minimal to no energy usage.
	Longevity	<ul style="list-style-type: none"> Durable due to braided old clothes.
	Maintenance and repair	<ul style="list-style-type: none"> Requires no special maintenance; occasional washing keeps it clean.
	Disposal	<ul style="list-style-type: none"> Natural materials biodegrade easily.
Personal Meaning: inner values, conscience, spirituality.	Self-expression	<ul style="list-style-type: none"> Makers express creativity and identity through the hand-making process. Buyers value traditional practices and develop emotional bonds with the product.
	Historical significance	<ul style="list-style-type: none"> <i>Chindi</i> rugs have been used in India since the 13th century and remain popular in rural areas.
	Ceremonial use	<ul style="list-style-type: none"> Commonly gifted during weddings and used for social gatherings.
	Spiritual values & beliefs	<ul style="list-style-type: none"> Used for praying, childbirth, and funerals by some communities.
Social Meaning: community, compassion, equity and justice.	Health benefits	<ul style="list-style-type: none"> Sleeping on these rugs is considered beneficial for neck and back problems due to the thin and firm surface.
	Local culture	<ul style="list-style-type: none"> Production depends on local communities and ecosystems, fostering relationships and support systems.
Economic Means: financial viability and ethical income generation.	Community	<ul style="list-style-type: none"> Enhances community bonds through local knowledge exchange and trade.
	Livelihood & Job creation	<ul style="list-style-type: none"> Entire families and multiple communities (e.g., utensil vendors, braid makers, and weavers) are involved, generating income and boosting local economies.
	Ensuring the other three elements of the QBL are fulfilled	<ul style="list-style-type: none"> Promotes sufficiency, meaningful consumption, and long-term sustainability over profit-driven, unsustainable practices.

4.3.4 *Patravali* - Leaf Plates

4.3.4.1 What is a *patravali* - leaf plates?

Patravali, also known as *Pattal* are eating plates, bowls or trenchers made with broad leaves which are made in India. They are mainly made from sal leaves, banana leaves, palm leaves, jackfruit leaves and banyan tree leaves. Plates are made in a circular shape, by stitching 6 to 8 leaves with tiny wooden sticks. Food is served on both fresh and dried *pattal*. The plates are often used for traditional meals, at festivals and in temples. The manufacture of the plates is a cottage industry in India and Nepal, where women work on weaving them at home in their spare time. In the past, the leaves were extensively used for packing breakfast, meals, and groceries and this practice is still continued in some rural parts.



Figure 18 Leaf Plates (Source: Switcheko Website)

4.3.4.2 The use of *patravali* in everyday lifestyle as well as in social, economic, spiritual contexts

In India, serving food on leaf dining plates is a long-standing tradition with its own cultural, religious, medicinal, and socioeconomic significance. Leaf plate stitching provides livelihoods for tribal people in Maharashtra, Odisha, Madhya Pradesh, Chhattisgarh, Andhra Pradesh, and Telangana states of India. The leaves and leaf plates are used for offering food to gods during worship and in the distribution of *prasadam* (food) to devotees. The custom of serving meals on leaves and leaf plates is considered as pure and good practice during various occasions such as marriages and birthdays; and free food offered during community feasts and religious festivals. During certain harvesting festivals in various regions, the ritual of eating and drinking using leaf

plates and bowls is considered sacred and beneficial to health as banana leaves contain a lot of polyphenols, a characteristic cancer-preventing agent found in many plant-based foods (Hegde *et al.*, 2018; Anand, 2024). Throughout India the leaves from a vast variety of plants are used as dining plates, food wraps during steam cooking, for grilling and frying of various dishes, and as food packing material.

There are many ways of worshipping gods for Hindus, in which *puja* (a worship ritual performed everyday) is the most popular form. The *puja* is performed by offering a standard system of 16 services to be executed to the god at temples and homes. Among the 16 services, offering food is one of the forms of expressing reverence and food is offered to the god either on a single broad leaf or plate made from leaves. During the practice of eating food on a leaf plate with hands, the touch connects all the sense organs with the mind. The practice of eating with hands while sitting on the floor is very useful for today's generation in controlling gastritis and obesity (Hegde *et al.*, 2018).

In the practice of Ayurveda many of the leaves used to make plates are considered medicinal and are used for treating various types of ulcers, wounds, leprosy, earache, and headache. Most of the leaves provide a rich source of various flavonoids and exhibit anti-inflammatory, antinociceptive, antibacterial, antipyretic, antihelminthic, alexiteric, and wound healing activities (Merish, Tamizhamuthu and Walter, 2013).



Figure 19 Food served on banana leaf (Source: LinkedIn, Photo by Fernando Rosselli)

The fresh leaves are used for cooking and serving several regional culinary recipes, along with serving small snacks. The leaves are also used as packing material for cooked food, such as *idli*, sweets like *jilebi*; and meat. Leaves, leaf plates and bowls are used in small hotels and butcher's shops, local eatery outlets and by street food vendors. Wrapping the food in leaves not only

enhances the aroma of steam cooked food, but also increases the shelf life (Hegde *et al.*, 2018). Cone-shaped leaf wraps are used to sell flowers and other fresh produces outside temples. Leaf bowls are also made into cups and bowls for serving liquid foods such as soup, dhal, and ice creams.

Certain types of leaves, such as palm leaves when naturally fallen, have thick sheaths, which are collected, washed, soaked in hot water, and hot compressed to fabricate plates and cups. This type of leaf plates are rigid, dense, heat-tolerant, and high quality. They are leak proof, water resistant, odourless; freezer, microwave, and oven safe; naturally biodegradable and compostable. In terms of food safety, they are safe to use with moist food for single use and for multiple times for dry food. The leaf plates and cups are also used for holding cold and hot liquids, as they exhibit thermal resistance and shape rigidity (Shashikumar *et al.*, 2016). Banana leaves are used for serving food, and eating a meal on a banana leaf is a longstanding unique tradition, especially in the southern and some of western states of India. It is a healthy, traditional, and auspicious practice to serve meal on banana leaves during festivals, family functions, weddings, traditional feasts, and religious occasions. The banana leaves are amongst the favourite types of leaves used as dining plates for hot foods due to the abundance of polyphenols, which act as antioxidants and help in digestion of the food by emanating its ingredients such as vitamin C and potassium. Most importantly, the large blade size of the leaf accommodates multi-course meals such as rice, curries, chutney, and sweet dishes. The leaves are water and leak proof; free from detergent residues and provide specific flavour and aroma after serving steamed food. Furthermore, the disposed biodegradable leaves are used as meal for cows and buffalos. In many restaurants in Tamil Nadu and Karnataka, it is customary to serve the food on banana leaves and blanched banana leaves are also used for certain takeaway traditional food from eateries. During the festival of Ganesh Chaturthi, people from Maharashtra eat food served on banana leaves. Most importantly, the practice is considered sacred by offering *naivedyam* (food) on banana leaves to various gods and goddesses.

The production of plates and other cutlery from leaves is a very small-scale cottage industry in India, characterized by decentralized production units scattered across rural areas. These units are usually small-scale, with limited use of machinery. The industry's structure allows for flexibility, as production can be adapted to local demand and availability of raw materials. With time, it has gained importance, mostly due to its traditional, cultural, religious, and ecological value. The yearlong continuous demand for the leaves provides sustained income source for many marginal farming families and offers the ability to act as a buffer during the price fluctuation in fruit trade. It also means that wet and high land can be utilised for growing the

leaves. Leaf plate cottage industry provides employment opportunities, especially in regions where alternative income sources may be limited. Artisans and workers involved in the manufacturing process, including leaf collectors, plate makers, and craftsmen, contribute to the production chain.

4.3.4.3 Making of the *patravali*

The traditional making of leaf plates in India involves a meticulous process that has been passed down through generations. Usually, the leaf collection from nearby forests is done by women, and in forests further away by men. In many regions leaves are only collected in particular seasons for several reasons, including the availability of fallen leaves, allowing for the regeneration of leaves and sustenance of forest cover, and for religious and sacred purposes. The normal steps involved in leaf plate production are as follows:

Leaf Selection: Leaves from specific trees are chosen for making plates. These include banana leaves, sal leaves, and areca palm leaves. These leaves are preferred for their large size, durability, and flexibility.

Leaf Preparation: The selected leaves are thoroughly cleaned to remove dirt, debris, and any pests. They are washed with water and sometimes wiped with a clean cloth to ensure they are free from impurities.

Cutting and Shaping: The cleaned leaves are then trimmed into desired shapes and sizes using a sharp knife or scissors. Common shapes include rectangular or square plates, but some regions have unique traditional designs.

Stitching or Weaving: To make the plates sturdy and secure, the trimmed leaves are stitched or woven together using natural fibres, or twine. Makers employ traditional techniques, such as needle and thread or intricate weaving patterns, to hold the leaves in place.

Drying and Pressing: The stitched or woven plates are laid out to dry in a well-ventilated area, usually under the sun. This step helps remove moisture and ensures the plates retain their shape and strength. In some cases, the plates are pressed manually under heavy objects during the drying process to maintain the shape. Recently some small-scale businesses use industrial dyes and drying machines for bulk orders. The leaf scrap waste generated during the process can be made into biodegradable paper.

Packaging and Distribution: The finished leaf plates in various sizes are typically stacked and packaged in bundles or packs, ready for distribution. They may be transported to local markets,

retailers, or wholesalers for further sale or used directly in catering services, events, or religious ceremonies.

The specific techniques and variations in the traditional making of leaf plates can differ across regions in India. Local craftsmanship, cultural practices, and the availability of specific leaf varieties influences the techniques used. Additionally, in some places minimal contemporary manufacturing processes may incorporate mechanized methods to meet larger-scale production demands.

4.3.4.4 Environmental sustainability of the *patravali* today

Governments around the world are introducing single-use plastics bans to alleviate plastic pollution and its detrimental impacts. Globally, over 300 million tonnes of plastic are produced each year and the trend is increasing (Herberz, Barlow and Finkbeiner, 2020). In 2015, the amount of plastic which had accumulated in landfills or the natural environment was estimated to be approximately 5000 million tonnes and it is predicted to increase to 12,000 million tonnes by 2050 (Herberz, Barlow and Finkbeiner, 2020). As the UK Government Environment secretary Thérèse Coffey stated “A plastic fork can take 200 years to decompose, that is two centuries in landfill or polluting our oceans,” (Davis, 2023). Plastic items relating to takeaway food and drink, including food containers and cutlery, make up the largest share of litter in the world’s oceans (Davis, 2023).

The impact of single use disposable plasticware in our day to day lives has led to a search for alternate renewable resources, such as the use of plant leaves as dining plates and food wraps, a traditional practice in India. The long-standing tradition of using leaves has its own cultural, religious, medicinal, socioeconomic importance in India. The leaves are one of the regenerative forests products and are collected from the forests by the tribal people of India. The leaf plates are environmentally friendly, biodegradable, are able to be stored for longer durations and can be easily disposed of. They are financially economical and do not require cleaning with phosphate-rich soaps and detergents, which can be a labour-intensive process. The synthetic detergents used in cleaning contemporary food serving products that are released into the water bodies lead to a phenomenon known as eutrophication, in which excessive growth of algae and its anaerobic decomposition depletes dissolved oxygen leading to marine life deaths (Sarin, 2017). The leaves can have a positive effect upon personal sanitation as they exhibit significant antibacterial and antifungal properties, thus protecting us from the environmental and food borne pathogens (Sahu and Padhy, 2013). The abundance of polyphenols in the

leaves, which can permeate the food served on them can mean they are ideal natural antioxidants (Hegde *et al.*, 2018). Furthermore, the production of leaf plates generally requires minimal energy input compared to the manufacturing process of plastic plates.

Plastic production involves energy-intensive processes, including extraction, refining, and manufacturing, contributing to greenhouse gas emissions and environmental impact (Herberz, Barlow and Finkbeiner, 2020). Leaf plates are handmade with the use of minimal tools and equipment, typically involving less energy consumption during their production. The used plates serve as a meal for the goats and cattle roaming in the streets or they biodegrade and can be easily composted or used as organic waste, returning valuable nutrients to the soil.

4.3.4.5 *Patravali* through the lens of adapted QBL

The following table presents a summary of key points of the above sections into the adapted categories of QBL.

Table 12 Patravali through the lens of adapted QBL

QBL Dimensions	Adopted categories	Summary of <i>patravali</i> - leaf plates
Practical Meaning: utilitarian needs and environmental consideration.	Practical application	<ul style="list-style-type: none"> Handmade leaf plates and bowls are used for food consumption and packaging.
	Materials	<ul style="list-style-type: none"> Made from sal, banana, palm, jackfruit, and banyan tree leaves.
	Manufacturing	Process includes: <ul style="list-style-type: none"> Collecting and preparing leaves. Cutting, shaping, and stitching with natural fibers or twigs. Drying, pressing, packing, and selling.
	Energy usage	<ul style="list-style-type: none"> Predominantly handmade with minimal tools; small-scale businesses may use industrial dies and drying machines for bulk orders.
	Longevity	<ul style="list-style-type: none"> Typically, single-use products.
	Maintenance and repair	<ul style="list-style-type: none"> Requires no special maintenance.
	Disposal	<ul style="list-style-type: none"> Fully biodegradable; scraps are used to make biodegradable paper or serve as food for animals like goats and cattle.
Personal Meaning: inner values, conscience, spirituality.	Self-expression	<ul style="list-style-type: none"> Makers gain identity and self-expression through hand-making. Buyers take pride in traditional practices and connect emotionally with the product.
	Historical significance	<ul style="list-style-type: none"> Used for centuries during marriages, religious ceremonies, and community feasts.
	Ceremonial use	<ul style="list-style-type: none"> Widely used in religious rituals, festivals, weddings, and community gatherings.
	Spiritual values & beliefs	<ul style="list-style-type: none"> Seen as auspicious, symbolizing purity and devotion. Used in offering food to gods during prayers and for prasad distribution in temples. Leaves are often associated with Hindu gods, adding a sacred element.
	Health benefits	<ul style="list-style-type: none"> Leaves have medicinal properties recognized in Ayurveda, aiding in treating ulcers, wounds, leprosy, earache, headaches, and more. Rich in flavonoids, offering anti-inflammatory, antibacterial, and wound-healing benefits. (Merish, Tamizhamuthu and Walter, 2013).
Social Meaning: community, compassion, equity and justice.	Local culture	<ul style="list-style-type: none"> Designs and techniques vary across communities, utilizing locally available leaves and traditional methods.
	Community	<ul style="list-style-type: none"> Strengthens community bonds through local knowledge exchange and trade. Symbolic use in community gatherings and social events.
Economic Means: financial viability and ethical income generation.	Livelihood & Job creation	<ul style="list-style-type: none"> Families participate in production, serving as a main or supplementary source of income. Local sales boost the economy.
	Ensuring the other three elements of the QBL are fulfilled	<ul style="list-style-type: none"> Encourages sufficiency, meaningful consumption, and sustainable practices over profit-driven, unsustainable methods.

4.3.5 *Matka* - Earthen Water Pot

4.3.5.1 What is *matka*?

The *matka* is a traditional clay pot used for storing and cooling water in various parts of India. It is typically made from unglazed terracotta or clay and has a distinctive spherical shape with a narrow neck and a wide base. The word *matka* means earthen pot in Hindi.



Figure 20 *Matka*

4.3.5.2 The use of *matka* in everyday lifestyle as well as in social, economic, spiritual context

The making of pottery is an important event dating to pre-history and represents products used since the beginning of Neolithic revolution in human society (Robb, 2020). Many of the traditional communities in India still maintain this making tradition as their occupation. The pottery making art differs slightly, region to region and community to community.

Matkas are commonly used in households in rural areas, especially in areas with limited access to refrigeration, or during hot summer months. The porous nature of the clay allows water to evaporate through the pot's surface, resulting in a natural cooling effect. This process helps keep the stored water cool and refreshing, making it a popular choice for drinking water in many Indian homes.

To use a *matka*, water is poured into the pot and allowed to seep through the clay. As the water slowly evaporates from the surface, it cools down the remaining water inside. The coolness of the water is maintained for a longer period due to the insulating properties of the clay.

Matkas have been used for centuries in India and are considered a sustainable and eco-friendly alternative to refrigeration or plastic water containers. They are part of India's rich cultural heritage and are still widely used in both rural and urban areas. In addition to their functional benefits, *matkas* also add a touch of traditional aesthetics to the households where they are used. They have been used for various purposes in everyday life in rural parts:

As water storage containers: earthenware is a natural refrigerant; the porous nature of the earthen pots makes the water sift through the pores, it extracts the heat from the contained water and evaporates from the surface. This is a continuous process which leads to decrease in water temperature inside the pot: the more the ambient heat, the greater the cooling effect. Hence, earthen pots (*matka*) are a vital accessory for kitchens in rural India.

As kitchen utensils: utensils such as tumblers, woks, plates, bowls, and tandoor-pots are different products made from terracotta. Food cooked in earthenware saturated with water provides slow evaporation of steam from pores, resulting in characteristic flavours and healthy food. Some communities in western India coat cooking terracotta pots with natural lacquer for non-stick cooking.



Figure 21 Clay utensil (Source: The Imperial Farm website)

As material storage containers: various sizes of terracotta pots are used as storage containers, for household items including grains, utensils, and bedding. These containers have been used since the Indus Valley Civilization. While storing grains natural pesticides (medicinal leaves, grass

etc.) are used to provide preventive protection which ensures effectiveness against pests for several months.



Figure 22 Clay storage for grains (Source: LinkedIn, photo by Akanksha Yadav)

As earthen lamps: *Diya* or *Deepak* constitutes a significant part of terracotta pottery usage, and they are in high demand during Diwali and other festivals. Oil is poured into these earthen lamps and a cotton wick is installed which is then burnt for illumination. These lamps hold significant religious and ceremonial symbolic meanings.

As decorative accessories: some potters also make decorative objects such as toys, wall hangings, garden accessories for indoors and outdoors use. Terracotta planters are also widely used throughout India. Many traditional techniques of decorating and making terracotta objects exist and are vernacular.



Figure 23 Decorative clay accessories (Source: The Telugus Website)

Street food containers: Street vendors in some places use terracotta pots or containers to serve beverages like *lassi*, *chai*, or juices as well as savoury snacks. After use these containers can be immersed in water and that clay can be re-used to make new set of containers. Terracotta containers are often used for the display and presentation of food items, vendors arrange fruits, vegetables, or other food products in terracotta bowls or trays to make them more appealing.



Figure 24 Clay tea cups at street tea vendor (Source : Sara Duana Meyer)

Community water stand: in many rural parts of India, specifically in western and hot areas, huge terracotta pots are placed on the side of the streets so people passing can drink water from it for free. In India, serving water to the thirsty is considered auspicious, so in deserted and hot areas and during summer months many individuals and communities take initiatives to manage this communal water sharing.



Figure 25 Community water stands (Source: Esakal Website)

The importance of the earth in Indian culture is illustrated by the metaphors of clay and pot that have been used repeatedly not only in Indian sacred texts but also in myths, poetry and literature to explain the eternal truth. Earth is the most primary of the *Panchamahabhutas* or 5 sacred elements others being air, fire, water and space (Subrahmanian, 2018). Earth carries all the *Panchamahabhutas* or elements within it. In India there are many mythological origins of the potters' craft. One prevalent myth is set in *Satyuga*, in a time when man and gods mixed freely. Shiva the god of destruction and one of the three major gods, wanted to marry *Parvati* the daughter of Himalaya. However, they did not have a *kumbha*, or an earthen pot, without which the marriage could not take place. Other gods or men assembled for the ceremony contributed with their divine weapons and powers to *Prajapati* (a god of creativity) to form the pot, and the Goddess Parvati poured out her blood to decorate the pot. This is how the first *Kumbh* (earthen pot) was made. The descendants of *Prajapati* (a god of creativity) are called *Khumbhars*, or the pot makers. There many more stories and religious significance is associated with clay terracotta pots. Even today at a Hindu wedding stacked pots containing grains and holy water, which represent fecundity and the cosmos, stand at the four corners of the wedding *mandapa*, or square, surrounding the bride and groom. They are also symbolically used in many other ceremonies and rituals including birth and death.

According to Ayurveda, storing and cooking food in terracotta clay pots provide several health benefits. Terracotta is an alkaline clay; therefore, it interacts with the acidity of water and provides the proper pH balance. This water can help curb acidity and in turn provides relief from gastronomic pains. When acidic food like meat or milk is cooked in an earthen pot, the clay helps to neutralize the overly acidic qualities of food as well (Bansal *et al.*, 2020). Clay pots add many important nutrients like calcium, phosphorous, iron, magnesium and sulphur to food or water stored in it, which are extremely beneficial to our body (Gomes, 2018). Terracotta is a natural material and does not contain harmful chemicals or additives. Unlike some other materials, such as plastics or non-stick coatings, terracotta does not leach harmful chemicals into the food or water stored in it. This makes it a safer and healthier option for food preparation and water storage.

4.3.5.3 Making of the *matka*

The traditional making process of terracotta pots involves different stages such as clay refining, clay mixing, throwing on the wheel, drying and firing.

Clay refining and mixing: Clay is refined to remove impurities, then mixed with water and other raw materials to form dough. The clay is manually filtered and mixed to achieve the desired consistency.

Throwing or shaping process: The mixed clay is shaped on a potter's wheel, with craftsmen using hand or tool techniques to create the desired form. Objects may be shaped using hand-building techniques as well. The surface is smoothed and patterns are created.

The shapes of terracotta vessels are tailored to their functions. *Matka* have spherical bases and steep sloped upper halves to collect water efficiently. Grain storage pots have wide mouths for easy access, while water containers feature narrow mouths to prevent spills. Cooking utensils have wide mouths for stirring and thick rims for handling when hot. The forms are also very closely related to the demand of the consumers; the occupation, family, clan identity, culinary habits and rituals.

Drying: The formed objects are allowed to dry under the sun for 2 to 3 days to achieve malleability without becoming too tough. Some objects are covered to prevent excess drying and cracking.

Firing: Objects are fired in a traditional open furnace called a *bhatti*. They are carefully piled, covered with fuel such as coconut leaves or cow dung cakes, and fired to a high temperature. This process results in red or black colour depending on smoke ventilation. The red colour is obtained when the smoke comes out through the vents of the kiln, whilst the black colour is obtained by covering the vents completely without allowing the smoke to come out. After firing the objects are tested and the producer separates the good quality pieces and the damaged ones.

4.3.5.4 Environmental sustainability of the *matka* today

Terracotta pots are made from clay, which is a natural and abundant resource. Clay is sourced from the earth, and its extraction process has minimal environmental impact compared to the extraction of other materials like plastic or metal. Furthermore, terracotta is a biodegradable material, meaning it can break down naturally over time. When a terracotta pot reaches the end of its life or is discarded, it will eventually decompose back into the earth without leaving behind harmful residues or contributing to pollution. Alternatively, the same clay can be reused to make new terracotta objects. As these are handmade by the traditional potters with minimal tools and equipment, they require minimal energy use, compared to the manufacturing of synthetic materials such as plastic. These pots do not require huge manufacturing units and

machineries, as they are simply made in backyards of the potter's house. However, the process of firing the terracotta products contributes to the air pollution and greenhouse gas emissions, although the clay can be shaped and fired at lower temperatures, resulting in lower energy consumption and reduced greenhouse gas emissions. As firing terracotta at higher temperatures ensures greater strength, durability, and resistance to water absorption, making the vessels more suitable for practical use, decorative objects are fired at lower temperatures. Additionally, the pots are made and used locally, contributing to local economy without need for transportation and extensive resource use.

In contrast, disposable plastic water bottles, predominantly made from petroleum-based materials like PET, have a significant environmental impact due to their resource-intensive extraction and processing, as well as their contribution to long-lasting plastic pollution (Mangold and von Vacano, 2022; EPA, 2023; European Environment Agency, 2024). While recyclable, plastic can typically only be recycled once or twice before degrading in quality and often ends up downcycled, requiring substantial energy in the process (Mangold and von Vacano, 2022; EPA, 2023; European Environment Agency, 2024).

4.3.5.5 *Matka* through the lens of adapted QBL

Following table presents a summary of key points of above sections into adapted categorised of QBL.

Table 13 Matka through the lens of adapted QBL

QBL Dimensions	Adopted categories	Summary of <i>matka</i> - earthen water pot
Practical Meaning: utilitarian needs and environmental consideration.	Practical application	<ul style="list-style-type: none"> Traditional handmade clay pot used for storing and cooling water.
	Materials	<ul style="list-style-type: none"> Made from natural, coarse, porous clay mixed with sand and water.
	Manufacturing	<ul style="list-style-type: none"> Process: shaping soft clay on a potter's wheel → drying for rigidity → shaping and refining with tools → firing in open or closed kilns. Firing produces auburn or black-coloured pots depending on the kiln type.
	Energy usage	<ul style="list-style-type: none"> Shaping is manual; firing requires minimal energy.
	Longevity	<ul style="list-style-type: none"> Generally lasts for years; some replace water pots annually as a ritual.
	Maintenance and repair	<ul style="list-style-type: none"> Requires only regular cleaning.
	Disposal	<ul style="list-style-type: none"> Fully biodegradable; old clay can be recycled into new products.
Personal Meaning: inner values, conscience, spirituality.	Self-expression	<ul style="list-style-type: none"> Hand-making provides makers with identity and pride in their craft. Buyers appreciate traditional practices and develop emotional bonds with the product.
	Historical significance	<ul style="list-style-type: none"> Terracotta has been a cultural staple since the Indus Valley Civilization (3300–1700 BCE).
	Ceremonial use	<ul style="list-style-type: none"> Widely used in rituals for marriages, births, deaths, and festivals.
	Spiritual values & beliefs	<ul style="list-style-type: none"> Symbolic significance in Indian mythology and religion; linked to gods and creativity. Potters are seen as descendants of the god of creativity.
	Health benefits	<ul style="list-style-type: none"> Storing water or food in clay pots adds essential nutrients like calcium and magnesium. Terracotta's alkalinity helps with gastric pains, as per Ayurveda.
Social Meaning: community, compassion, equity and justice.	Local culture	<ul style="list-style-type: none"> Regional variations in terracotta-making and decorating techniques, e.g., non-stick utensils made with natural gum in Western India.
	Community	<ul style="list-style-type: none"> Promotes community knowledge-sharing and economic networks through local sales. Used in ceremonies and festivals, reinforcing social bonds.
Economic Means: financial viability and ethical income generation.	Livelihood & Job creation	<ul style="list-style-type: none"> Pottery is often a family profession, with men traditionally working on the wheel while women contribute to clay preparation and decoration. In some regions, women have innovated new techniques to overcome traditional restrictions. Local sales boost regional economies.
	Ensuring the other three elements of the QBL are fulfilled	<ul style="list-style-type: none"> Encourages sufficiency, long-term meaningful consumption, and sustainable practices over profit-driven methods.

4.3.6 Sill Batta - Mortar and Pestle

4.3.6.1 What is *sill batta* – mortar and pestle?

The mortar and pestle is an example of a domestic tool that has stood the test of time, as it has existed since the Stone Age, yet is still in widespread use around the world today. Most people who live in rural villages in India largely depend on basic energy saving techniques and handmade local equipment to prepare their everyday meals, such as *pata varwanta* (handmade grinding stone and rolling pin) and *sil batta* (handmade mortar and pestle).



Figure 26 Traditional stone mortar and pestle (Source: Kernow Furniture)

4.3.6.2 The use of *sill batta* – mortar and pestle in everyday lifestyle as well as in social, economic, spiritual contexts

The *sil batta*, a traditional kitchen tool in India, consists of a flat, sturdy stone base (*sil*) and a cylindrical stone pestle (*batta*), used primarily for grinding spices, herbs, and other food items. Its significance extends beyond culinary purposes, encompassing broader social, economic, and spiritual dimensions within Indian culture. In Indian households, the *sil batta* remains indispensable for grinding fresh spices. Unlike modern electric grinders, the *sil batta* allows for manual control over the grinding process, ensuring that spices retain their essential oils and flavours. This tactile approach to grinding enhances the aroma and taste of dishes, making it a preferred method for traditional cooking.

The *sil batta* holds deep cultural significance in Indian homes. Often passed down through generations, it symbolizes continuity and tradition in culinary practices. The rhythmic sound of

grinding spices on the *sil batta* is a familiar and comforting sound in many Indian kitchens, evoking nostalgia and a connection to heritage. Its presence in the kitchen is a reminder of familial bonds and shared culinary experiences. Grinding spices on the *sil batta* is a communal activity in many households, particularly among women. It serves as a gathering point where family members come together to engage in conversation, share stories, and exchange gossip while preparing meals. This communal aspect fosters social cohesion within families and communities, reinforcing cultural values and traditions.

The craftsmanship involved in making *sil battas* supports local economies, particularly in regions where traditional stone carving skills are prevalent. Artisans specializing in crafting *sil battas* contribute to the preservation of traditional craftsmanship and earn a livelihood through their skills. The demand for *sil battas* also provides economic opportunities for local artisans, sustaining their craft and heritage. In some Indian cultures, the *sil batta* is not only a kitchen utensil but also holds spiritual significance. It is used in religious rituals and ceremonies, particularly in food preparation for offerings and festivals. The act of grinding spices on the *sil batta* is considered a sacred practice in some traditions, connecting food preparation with spiritual observances and reinforcing cultural customs. Traditionally, turmeric/dye are ground for use in a mortar and pestle for special Hindu ceremonies like weddings. Using the *sil batta* is believed to offer health benefits. The slow grinding process helps preserve the nutritional value of spices and herbs, ensuring that they are not overheated or oxidized during grinding. This traditional method is valued for its ability to maintain the potency and freshness of ground spices, enhancing both flavour and health benefits in culinary preparations.

The *sil batta* transcends its functional role as a kitchen tool to embody cultural heritage, social interaction, economic sustenance, and spiritual symbolism in Indian society. Its enduring presence in everyday life underscores its integral place in Indian culinary traditions and broader cultural practices, enriching the culinary experience while preserving artisanal craftsmanship and community bonds. The *sil batta* not only connects generations through shared culinary experiences but also supports local economies and reinforces spiritual and cultural practices, making it a cornerstone of traditional Indian lifestyle and identity.

Making of the *sill batta* – crafting a traditional *sill batta* involves a meticulous process that blends traditional craftsmanship with functional design. Each step—from stone selection to final polishing—requires skill, patience, and an understanding of both practical and cultural dimensions. In every region the materials used for making *sill batta* differs, for example in Rajasthan due availability of marble material, *sill batta* in that region are made in marble, in

some south Indian regions they made in wood or metals like brass and other regions uses various stones such as granite, sandstone, soapstone etc.

The normal steps involved in stone *sill batta* production are as follows:

Stone selection

Craftsmen begin by carefully choosing two types of stones suited for the *sill batta*: a large, flat stone for the base (*sil*) and a cylindrical stone for the pestle (*batta*). The stones are selected based on their hardness, durability, and suitability for manual grinding.

Cutting

The selected flat stone is initially cut into a rough circular or oval shape using traditional tools such as chisels and hammers. This step begins the process of forming the base of the *sill batta*.

Grinding and smoothing

Craftsmen then meticulously grind and smooth the surface of the *sil* using manual grinders and abrasives. This process is crucial to create a perfectly flat and even grinding surface, essential for effective spice grinding.

Shaping

Simultaneously, the cylindrical stone for the pestle is shaped to achieve a comfortable grip and proper weight distribution. Artisans use hand grinding and polishing tools to shape the pestle while ensuring it fits snugly within the *sil*.

Balancing

Careful attention is paid to balancing the weight and dimensions of the pestle to optimize its performance during grinding. This ensures ease of use and efficient grinding of spices and herbs.

Polishing

After shaping both the *sil* and *batta*, craftsmen proceed to polish the surfaces to a smooth finish. This enhances the aesthetic appeal of the *sill batta* while reducing friction during grinding, thereby improving its functionality.

Decorative elements

Depending on regional traditions and artisan preferences, decorative carvings, engravings, or traditional motifs may be added to the *sil batta*. These embellishments not only beautify the tool but also add cultural significance, reflecting local craftsmanship and heritage.

Rituals and blessings

In some communities, the finished *sill batta* may undergo blessing rituals or ceremonies. These rituals imbue the tool with spiritual significance and symbolize its importance in culinary traditions and daily life.

4.3.6.3 Environmental sustainability of the *sill batta* – mortar and pestle today

The traditional *sil batta* transcends its functional role in Indian kitchens, encompassing ecological, social, and cultural dimensions that contribute to its enduring relevance. The production of *sil batta* are crafted from natural stones such as granite, sandstone, marble, or soapstone: these materials are sourced locally, and made locally for local consumption. Natural stones are renewable resources that require minimal processing, reducing environmental impacts compared to synthetic materials.

Sil battas are renowned for their durability and longevity, offering a meaningful alternative to disposable kitchen gadgets. Their robust construction ensures they can withstand frequent use over decades, eliminating the need for frequent replacements and reducing waste generation. The longevity of *sil battas* supports sustainable consumption patterns by promoting products that endure through generations. The production process of *sil batta* involves traditional craftsmanship that often utilizes manual techniques and simple tools. This minimalistic approach reduces energy consumption and environmental pollution associated with modern manufacturing processes. Additionally, the natural composition of the stones used ensures that no harmful chemicals or synthetic additives are introduced into the environment during production or use.

Sil batta plays a vital role in preserving cultural heritage and supporting local economies. The craftsmanship involved in making *sil battas* provides livelihoods for skilled artisans, often in rural communities where traditional stone carving skills are passed down through generations. By valuing and continuing these artisanal practices, *sil battas* contribute to the socio-economic sustainability of artisan communities. From a health perspective, *sil battas* contribute positively by retaining the nutritional integrity of ground spices and herbs. The slow grinding process prevents overheating or oxidation, preserving the natural oils and flavours of spices. This enhances the nutritional value and taste of culinary preparations, promoting healthier eating

habits and well-being. Manual use of the tool during food preparation creates bond food making it more meaningful and allows sensory embodied experience.

In contrast, the contemporary electric spice grinder comprises approximately thirty large and small components constructed from a variety of plastics and metals. The extraction, manufacturing and distribution processes of these two objects are also radically different. The extraction and manufacturing processes associated with contemporary spice grinders are complex, dispersed and resource intensive as large quantities of raw materials, water and energy are consumed during all life cycle phases of the product, which generates hazardous waste and pollution. Furthermore, the difficulties associated with recycling complex electrical products often results in landfill disposal. By contrast, the traditional mortar and pestle emerges from a far simpler, less resource intensive process.

4.3.6.4 *Sill batta* – mortar and pestle through the lens of adapted QBL

Following table presents a summary of key points of above sections into adapted categorised of QBL.

Table 14 Sill batta – mortar and pestle through the lens of adapted QBL

QBL Dimensions	Adopted categories	Summary of <i>sill batta – mortar and pestle</i>
Practical Meaning: utilitarian needs and environmental consideration.	Practical application	<ul style="list-style-type: none"> Used for grinding spices, medicines, and making pastes/purees.
	Materials	<ul style="list-style-type: none"> Made from natural, local materials like stone, marble, wood, or metal. Comprises two simple components of the same material.
	Manufacturing	<ul style="list-style-type: none"> Handcrafted using simple tools; often made at home or in small workshops. Requires no assembly, as both components are made together.
	Energy usage	<ul style="list-style-type: none"> Fully manual; minimal energy required during production.
	Longevity	<ul style="list-style-type: none"> Extremely durable, often lasting generations.
	Maintenance and repair	<ul style="list-style-type: none"> Simple cleaning after use; easy to repair due to its handmade construction.
	Disposal	<ul style="list-style-type: none"> Natural materials decompose or remain environmentally neutral (e.g., stone lasts for lifetimes).
Personal Meaning: inner values, conscience, spirituality.	Self-expression	<ul style="list-style-type: none"> Hand-making fosters identity and pride among makers. Buyers value the effort and tradition, creating a bond with the product and the food prepared.
	Historical significance	<ul style="list-style-type: none"> Dates back to the Stone Age, pivotal for consuming diverse foods.
	Ceremonial use	<ul style="list-style-type: none"> Traditionally used to grind turmeric or dyes for Hindu weddings and rituals.
	Spiritual values & beliefs	<ul style="list-style-type: none"> Symbolizes fertility, abundance, and creation in Hindu mythology. Used by holy men and in rituals around Shiva temples (e.g., for making Bhang). Believed to release better aromas and flavors than automatic grinders.
Social Meaning: community, compassion, equity and justice.	Health benefits	<ul style="list-style-type: none"> Promotes muscle exercise, hand-eye coordination, and manual effort.
	Local culture	<ul style="list-style-type: none"> Materials and designs vary regionally (e.g., marble mortars from Rajasthan).
Economic Means: financial viability and ethical income generation.	Community	<ul style="list-style-type: none"> Strengthens local networks through knowledge-sharing and local production.
	Livelihood & Job creation	<ul style="list-style-type: none"> Provides income for local makers and creates jobs throughout production stages.
	Ensuring the other three elements of the QBL are fulfilled	<ul style="list-style-type: none"> Encourages meaningful, long-term use and sustainable consumption over profit-driven methods.

4.4 Design considerations

The examination of the case studies on traditional Indian products and their contemporary counterparts highlights several design insights.

When comparing traditional Indian products to contemporary equivalents, it becomes evident that modern production methods are significantly more resource intensive. Across the lifecycle of each product, from resource extraction to final assembly, and from consumption to disposal, there is a substantial utilization of resources, leading to adverse environmental effects (Russell and Allwood, 2008). This resource-intensive process results in negative environmental impacts at every stage, as depicted in Figure below.

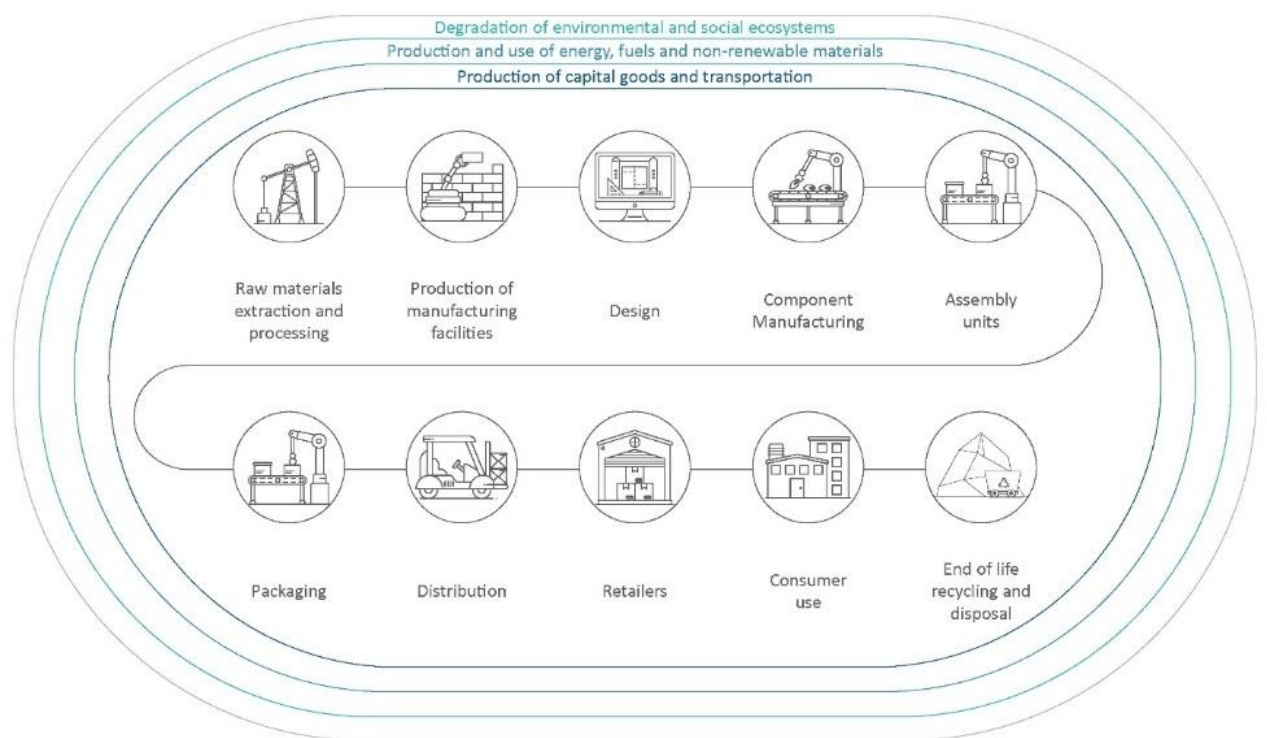


Figure 27 Modern production process

However, looking at traditional products through the lens of QBL and adapted categories suggested that the traditional products have the following properties: they are multiuse products with simple shape and form with far less components and materials, they are handmade with minimal tools and energy, they are made from natural, local, renewable materials, they are easy to maintain, repair, upgrade, recycle and are very durable. The products and associated practices revolve around simplified local meaningful production and

consumption ecosystem highlighting collectivism, co-ownership, co-creation, co-dissemination with emphasis on connection to local ecology, ecosystems, stories, myths, and rituals.

From here, I have identified the following five key thematic areas as design considerations, which are discussed in detail in section 6.3. These thematic areas have emerged through a process of analysing traditional Indian products and their contemporary counterparts. They are grounded in the adapted QBL dimensions and subcategories, providing a comprehensive framework for understanding sustainability in design. Below is an explanation of how each thematic area connects with and contributes to the QBL framework:

1. Knowledge transmission: fostering the transfer of techniques, skills, and traditions within communities

This theme focuses on the transfer of techniques, skills, and traditions within communities, rooted in the Personal Meaning dimension of QBL. The traditional products studied are not only utilitarian objects but also vessels for cultural and historical knowledge. This theme connects with the Historical Significance and Ceremonial Use subcategories, highlighting how products carry ancestral wisdom and practices that contribute to cultural preservation and community identity.

2. Local production-to-consumption ecosystem: exploring the interconnectedness of local production-to-consumption systems, emphasizing community engagement, interrelationships and co-creation

This theme addresses the interdependence of local production and consumption systems, with a focus on community engagement, co-creation, and sustainability. It links directly to the Social Meaning dimension, particularly Local Culture and Community subcategories. By emphasizing local production, this theme supports a circular economy where products are made and consumed within the same community, reducing resource consumption and promoting equitable economic systems.

3. Nurturing cultural meaning: fostering meaningful cultural values and rituals surrounding products and practices

Fostering cultural values and rituals surrounding products, this theme aligns with the Personal Meaning dimension of QBL, particularly Spiritual Values & Beliefs and Self-expression. It highlights how products are deeply intertwined with spiritual and cultural practices. This theme advocates for designs that foster connection to heritage, cultural narratives, and rituals, thus reinforcing the intrinsic value of the products beyond their material function.

4. Transparency and material honesty: advocating for transparent and honest practices in material use and manufacturing, promoting local materials and skills

This theme emphasizes the importance of transparent material use and ethical production practices. It corresponds with the Economic Means dimension of QBL, particularly the subcategories of Livelihood & Job Creation and Ensuring the Other Three Elements of the QBL Are Fulfilled. Traditional products made from local, renewable materials exemplify ethical sourcing and manufacturing transparency. This theme advocates for a design approach that prioritizes honesty in material selection and promotes fair economic practices while minimizing environmental impact.

5. Longevity and resource consciousness: emphasizing principles of repair, reuse, reduction, multi-use, longevity and resource sufficiency

This theme focuses on repair, reuse, reduction, multi-use, and longevity in design, contributing to the Practical Meaning dimension of QBL. It ties into subcategories such as Materials, Energy Usage, Longevity, and Maintenance and Repair. Traditional products are built to last, easy to repair, and require minimal energy. This theme highlights the importance of designing for durability and resource efficiency, encouraging sustainability through longevity and conscious use of resources.

Table 15 Summary of how adapted QBL sub-categories informed thematic areas

QBL Dimensions	Adopted categories	Thematic Area	Key Contribution
Practical Meaning: utilitarian needs and environmental consideration.	Practical application Materials Manufacturing Energy usage Longevity Maintenance and repair Disposal	Longevity & Resource Consciousness	Focus on functionality, resource sufficiency, durability, and local materials, contributing to resource-conscious and durable product designs.
Personal Meaning: inner values, conscience, spirituality.	Self-expression Historical significance Ceremonial use Spiritual values & beliefs Health benefits	Nurturing Cultural Meaning	Cultural and emotional value embedded in products, fostering rituals, customs, and personal connections.
		Knowledge Transmission	Transfer of traditional knowledge, skills, and techniques within communities, preserving heritage and fostering cultural continuity.
Social Meaning: community, compassion,	Local culture Community	Local Production-to-Consumption Ecosystem	Local production, community bonds, and shared cultural identity contribute to social equity, engagement, and sustainable local economies.

equity and justice.			
<u>Economic Means:</u> financial viability and ethical income generation.	Livelihood & Job creation Ensuring the other three elements of the QBL are fulfilled	Transparency & Material Honesty	Holistic understanding of ethical, environmental, and cultural implications, promoting transparency in materials and manufacturing processes.

These thematic areas are not isolated; they permeate the entire thesis, providing a cohesive framework for designing holistic and meaningful products. By revisiting these themes in the Chapter 5 and in discussion section 6.3, I draw connections between the theoretical foundations laid out in the literature review, the empirical findings presented in Chapter 4 and 5, and the practical implications for future design practices.

The integration of these themes supports the thesis’s overarching argument and provide a holistic approach to understanding how traditional practices can inform contemporary sustainable product design.

4.5 Summary

This chapter addresses two primary research objectives: RO 3 involves identifying and documenting traditional Indian products and practices that remain relevant to contemporary lifestyles through autoethnographic case studies, while RO 4 focuses on conducting a detailed analysis of selected traditional Indian products and practices to evaluate their alignment with sustainability principles, including evaluations of materials, production processes, and lifecycle considerations, and to highlight sustainability aspects through comparative studies with modern equivalents.

To achieve RO 3, the autoethnographic method was employed, as discussed in Chapter 3 (section 3.1.6.2). This approach involved immersing myself in the review of everyday life in rural India, detailed in section 4.2 of this chapter. Drawing from personal experiences growing up in India and professional insights from the handicraft sector, I explored daily activities and experiences, asking questions such as 'what is it like to...?', 'what did it involve...?', and 'what meanings and values are held...?' (Poulos, 2021). Through this narrative inquiry, I identified six traditional Indian products and associated practices that formed the basis of case studies, detailed in section 4.3.

For RO4, the selected traditional Indian products and practices were critically analysed using adapted QBL framework. This evaluation considered sustainability aspects, including materials, production processes, lifecycle considerations along with spiritual, ritualistic, social and cultural dimensions. The case study method facilitated an in-depth exploration of 'what', 'why', and 'how' aspects related to these products and practices (see section 3.1.4.3.1), maintaining a holistic view while focusing on specific objects within their cultural and contextual frameworks (Yin, 2009).

Overall, this chapter sought to document and analyse traditional Indian products and practices through an autoethnographic lens, highlighting their relevance to contemporary lifestyles and evaluating their sustainability using the QBL framework. By drawing on lived experiences and professional insights, this research contributes to understanding the cultural significance and environmental implications of traditional practices in the context of contemporary design and sustainability.

The next chapter presents findings from interviews with six design professionals working in the handicraft sector in India and assess their alignment with the five thematic areas outlined above.

Chapter 5 Indian Designers Working with Crafts: Key Insights

5 Indian Designers Working with Crafts: Key Insights

5.1 Introduction

This chapter reports on the findings from six semi-structured interviews conducted with design professionals working in the handicraft sector in India and addresses RO 5. The interviews were conducted with contemporary design professionals in India to understand their motivations and inclinations towards traditional crafts and sustainable design. The interviews sought to build upon the case studies in the previous chapter (which focused solely on traditional products and practices) to gain contemporary insights into why these designers choose to work with traditional crafts, how their work relates to principles of sustainability and where challenges might lie.

Interviewees were chosen based on their involvement in contemporary product design using traditional crafts, often as founders of platforms supporting and redesigning contemporary products with traditional Indian handicrafts. This purposive recruitment strategy ensured diverse and relevant insights. Semi-structured interviews were conducted online, allowing flexibility and depth in responses. This method provided a critical voice to complement autoethnographic findings, grounding the study in practical, real-world experiences.

5.1.1 Profiles of the designers

This section profiles the designers interviewed for this study, each dedicated to preserving and revitalizing traditional Indian crafts through contemporary design working with traditional crafts people. These designers integrate cultural heritage with modern aesthetics and functionality, focusing on sustainability and craftsmanship. The profiles highlight their backgrounds, philosophies, and notable projects, providing visual examples of their work and showcasing their contributions to the intersection of tradition and modernity.

Designer P1

Designer P1 leads a design based social enterprise aimed at empowering approx. 60 traditional crafts women artisans in rural areas. Their work involves providing training in both traditional and contemporary design skills, enabling artisans to create products that are market-ready and culturally significant. Designer P1's efforts have revitalized several dying crafts by introducing them to new markets.

Example of work:

Designer P1's initiative produced a series of home decor products, jewellery, stationery, keychains, brooches, festive edits like *rakhi* (a band used to celebrate sister and brother bonds), god idols, Christmas décor, Diwali décor, corporate giftings etc. that combine traditional crafts with contemporary products.



Figure 28 Handcrafted tea light holder for Diwali with traditional craft copper enamel (supplied by P1 used with permission)



Figure 29 Handmade stationery gift hamper with traditional art form Chitrakathi (supplied by P1 used with permission)

Designer P2

Designer P2 is a founder of an e-commerce platform and a retail space that specializes in integrating traditional Indian crafts into contemporary home decor products. With a background in industrial design, they have successfully collaborated with artisan clusters across India to create products that appeal to urban consumers.

Example of work:

Designer P2 developed a collection of chandeliers, furniture, wall pieces and other home décor products catering to luxury and upper idle class market in India. Their products not only showcase traditional craftsmanship but also aligns with modern design trends.



Figure 30 Chandelier made with traditional copper and brass crafts (supplied by P2 used with permission)

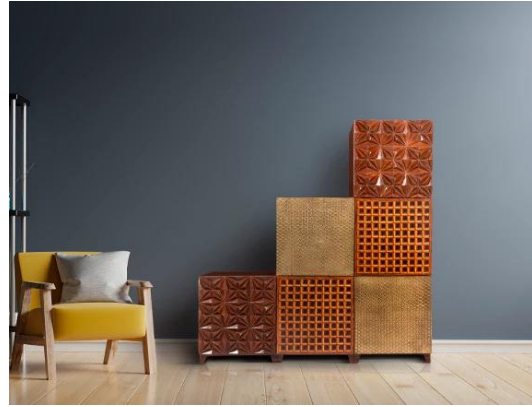


Figure 31 Cabinet made with traditional crafts like pitara, wood carving, sadeli (supplied by P2 used with permission)

Designer P3

Designer P3 is an industrial designer who collaborates with local artisans to produce high-end furniture pieces that reflect India's rich cultural heritage with an intersection of craft, design, and sustainability. They emphasize an interconnection of everything and advocate for holistic sustainability which considers social, economic, cultural sustainability alongside the ecological factor.

Example of work:

Designer P3 created a line of handcrafted wooden chairs that incorporate traditional bamboo craft and weaving techniques. These chairs are not only functional but also serve as artistic pieces that tell the story of the artisans' heritage and are suitable for traditional or modern Indian homes.



Figure 32 Bamboo chair with weaving made with traditional materials and techniques (supplied by P3 used with permission)



Figure 33 Bamboo chair with weaving made with traditional materials and techniques (supplied by P3 used with permission)

Designer P4

Designer P4 is a ceramics and glass designer who owns a collaborative e-commerce platform with traditional artisans selling designed and curated collections of contemporary lifestyle products in traditional terracotta crafts from heritage pottery clusters of India.

Example of work:

Designer P4 collaborates with clay crafts and potters around India and co-designs everyday household products along with home decor and festive products.



Figure 34 Set of kettle and cups made with Longpi pottery (supplied by P4 used with permission)



Figure 35 Wall clock made with Lippan mud art (supplied by P4 used with permission)

Designer P5

Designer P5 is a product designer and owner of a design studio renowned for creating enduring and robust products that seamlessly blend cultural references with functional necessity and traditional craftsmanship. Their approach emphasizes the harmonious coexistence of artisanal techniques and industrial precision, resulting in timeless, elegantly understated products.

Example of work:

Their interior collection offers products designed to evolve with their users over time. Their innovative Upgrade System allows each piece to be upgraded in scale (to a higher variant) and appearance (with new aesthetics), ensuring longevity and adaptability. This system enables users to replace damaged parts economically, through modular components, thereby extending the lifespan of their furniture while reducing waste.



Figure 36 An upgradable chair made with reclaimed wood by traditional makers, which promotes Sukhasana position (cross-legged) (supplied by P5 used with permission)



Figure 37 An upgradable day bed made with reclaimed wood by traditional makers (supplied by P5 used with permission)

Designer P6

Designer P6 owns a start-up dedicated to revitalizing lesser-known and fading crafts of India through innovative design interventions. P6 blends Scandinavian aesthetics with utilitarian elements to create contemporary home décor products.

Example of work:

Designer P6 has designed collections of various bags and baskets with various traditional materials and techniques made from craftspeople across India. P6 also collaborates with various crafts makers to create home decor and lifestyle products.



Figure 39 Handcrafted tote bag with grass (supplied by P6 used with permission)



Figure 38 Handcrafted bottle gift bag with grass (supplied by P6 used with permission)

5.1.2 Motivations to work with Craft

All six designers expressed an overarching passion for craft along with a profound interest in specific materials and craft techniques, which often served as the catalyst for their careers in the craft industry.

To illustrate, P4's professional journey is a compelling narrative of transformative change and dedication to craftsmanship. Originally holding a master's degree in design, P4 initially pursued a career in the corporate world to secure financial stability. However, P4's passion for ceramics and glass design, cultivated during Masters studies, prompted P4 to venture into a part-time pottery studio while maintaining a corporate role. In 2019 P4 resigned from this corporate job to fully immerse herself in the pottery venture. The COVID-19 pandemic in 2020 brought unforeseen challenges, particularly for fellow artisans who struggled to sell their products online due to lockdowns. P4 responded to this situation by offering financial support and assisted these artisans in establishing their online presence on platforms like Amazon. From the collaborative dynamics that emerged from this endeavour, the idea of creating a brand together was born. In September 2020, [brand name] was established as a collective effort to collectively market and sell the products of P4 and the artisans she supported. The underlying motivation driving P4's engagement with traditional crafts, particularly the art of terracotta pottery, finds its roots in her childhood experiences in rural villages. She recalled "I have very stark memories of one or two visits to very distant relatives in villages. And it was so beautiful, everything was handmade, organic, natural and handcrafted". Enchanted by the beauty of handmade and organic products, this fascination persisted through her engineering and design education. The collaborative foundation of [brand name] reflects not only entrepreneurial spirit but also a strong commitment to social responsibility. P4's overarching passion lies in preserving traditional crafts and supporting artisans in sustaining their livelihoods through meaningful work. She is motivated to showcase India's rich indigenous craft heritage with a wider audience through her creative practice.

P6 recounted a similar story. After graduating from the most prestigious university in India – the National Institute of Design, worked as a curator for an IT company. She made use of free time to create designs in terracotta. As her work became appreciated by more and more people, she quit her job and put all energy into running her own craft brand.

A similar narrative unfolded for P1, who started working with crafts when studying architecture. She was interested in "using local materials for construction." This introduced her to one professor who worked with a particular craft material. When she went to the National Institute

of Design in India, she learned more about crafts. As she said, "you cannot escape the crafts. While you are there at the institute, we were supposed to do cluster visits and documentation." These visits gave her the opportunity to interact with artisans. The influence of MP Ranjan, known as the craft guru of India, during her time at NID further solidified her interest in crafts. Her motivation extends beyond product design; she is driven by the desire to raise awareness of traditional crafts, revive them, and provide a sustainable livelihood for artisans who may have otherwise migrated to urban areas for work. After finishing her studies, her first job was as a consultant for a retail store's home accessory division where she "met many artisans. And most of them actually, it worked out my goal or a role was that time just to identify which are good products, which fit into one store." But she also gave them design suggestions to improve their products. Some of the artisans she is "still working with and this would be at least 19 or 20 years back when this journey started."

"So, my working with crafts, actually the love for crafts started when I was doing my architecture in [name of institute] and the subject which used to interest me a lot was appropriate technology, which is using local materials to build the houses, built architecture basically and through that, I was introduced to [another architect] who used to work in bamboo a lot. And that is how the introduction to crafts or basically working with bamboo started".

On a similar note, P2 had been interested in crafts since her student days, when visiting craft stores and bazaars while traveling sparked her curiosity. As a design student, she was influenced by her professor who felt crafts could be promoted through technology and e-commerce. In 2000, she launched an early craft e-commerce business to sell art and craft globally. Running this business for approximately eight years further deepened her interest in crafts. Through sourcing for the e-commerce business, she met artisans across India and was intrigued by the diverse craft skills that existed. In 2009, she set up [firm's name] with the goal of innovating crafts for customized interior design projects, recognizing their untapped potential in this domain. Her experience with the e-commerce venture and interactions with artisans over the years motivated her to start [firm] and work directly with craft communities to support their skills and livelihoods.

Parallel to these journeys, P3 started working with crafts from a young age as she was always interested in crafts. She pursued craft further in her design education during her undergraduate studies at National Institute of Science and Technology. After completing her undergraduate degree, she went to NID for her post-graduation studies, where she also continued working with crafts. She then worked intensively with crafts during her tenure as part of the

International Network for Bamboo, where she was coordinating the Africa and Latin America regions. Through this work, she started seeing craft not just as a physical object but as an entire ecosystem that involves design, marketing, production, access to capital and more. This led her to do a PhD in the area of crafts, where she realized craft has connections to world history and patterns of industrialization and de-industrialization across developing regions. Her interest in craft grew as she explored it further as an academic subject. To gain more hands-on experience and do experiments in the field, she founded [name of the firm], a for-profit consultancy firm. Through her PhD research and practice at her firm, she aimed to understand the intersection of crafts, sustainability and design and contribute to the body of knowledge in this area.

P5 became interested in working with crafts during her studies and work experiences in Europe. While at her master's program in Madrid, she said "the way we were exposed to the design culture in Europe, you know, sort of opened a lot of avenues and gave a lot of exposure." She then worked at a factory in Portugal and a communications research centre in Italy. During this time abroad, she realized the importance of understanding different cultures and contexts when designing. As she said, "even when you sort of realize that, the way I sit in India, or how Indian sit versus how German sit and how that basically affects an object." When she returned to India, she wanted to design in a way that was "relevant to how we live today, in our context in our country." This led her to start [name of the firm], where she focuses on celebrating local materials and craft practices from India. As she said, "India has some beautiful stones, some beautiful marbles...we can try to find these materials and promote them." She looks at crafts as a way to give products "more meaning towards it" and tell "good stories." Her goal is to design in a sustainable way that is still contemporary.

Alongside their deep passion for craftsmanship, these designers are acutely aware of the ethical dimensions of working with traditional crafts. They emphasize the importance of cultural sensitivity, ensuring that their design practices respect the origins and significance of the materials and techniques they use. Many have also reflected on the delicate balance between drawing inspiration from traditional crafts and avoiding cultural appropriation, striving to collaborate with artisans in a way that supports their communities while staying true to the cultural heritage they represent.

Summary

These six designers share a set of commonalities that underpin their craft journeys. First and foremost, their narratives are fuelled by an unbridled passion for craftsmanship. This deep love for crafts served as the cornerstone of their careers, propelling them from varied professional

backgrounds into the realm of design and craft. Each of them experienced pivotal career shifts, initially pursuing avenues outside the craft world, such as corporate sectors, and later moved into craft. Educational backgrounds in design, often acquired at esteemed institutions like the National Institute of Design, provided them with the necessary skills and knowledge to excel in the craft space. Most of them mentioned Professor M P Ranjan's influence and involvement of craft practices within course curricula. Their stories are marked by strong connections with artisans and craftspeople, acknowledging the pivotal role of collaboration. Entrepreneurs at heart, several embarked on crafting their own brands or consultancies, expanding the reach and impact of crafts. A global perspective, whether gained through international work experiences or exposure to diverse design cultures, broadened their horizons on the potential of crafts. The preservation of traditional crafts, blended with innovative contemporary design, is at the core of their work, striving to keep traditional techniques relevant. These shared traits reflect a collective dedication to crafting as a transformative and meaningful pursuit, regardless of their diverse backgrounds and experiences, underlining the potential of crafts to create sustainable livelihoods and innovative design solutions.

5.1.3 Buyers of their products

When asked about target clients, P2 provided further details on the different sectors they work with: "We work for the hotel industry, we work for corporates, we work for residential housing, homes, and houses, and we do their art, we do their lighting, we do their furniture, and we also are now getting into artefacts, by using artisanal skills to design interior spaces." By incorporating traditional crafts into contemporary pieces, her enterprise is able to cater to the product needs of these different sectors - from hotels seeking customized decor to corporates outfitting office spaces to residential clients looking to bring handmade elements into their homes.

P3 responded "In terms of consumers, the thing is that, it just depends on how you position your product. I think that, for me, craft is just like a different way of producing something without machines and without industrialization. So, I don't see any real problem marketing to any group, as long as you look at what the group is looking for the price points of the group, and so on and so forth." She further added, "However, that being said, I think that what is increasingly happening is that craft is at two ends of the spectrum, either the very rich are buying it, or either the very poor are buying it. I don't see it as a mass consumption item by the middle class. And that also does make sense to me because I think that craft is a product, which

is supposed to be high value, low volume". Based on this, the potential consumers of P3's products could be the very rich segments who are looking to buy high-value products, as well as the very poor segments, depending on how the products are positioned, priced, and marketed to different consumer groups. However, she does not see craft becoming a mass consumption product for the middle-class market.

P1 stated that her primary customers come from urban areas and understand the values of traditional crafts. To support this, she provided the quote: "consumers are urban, urban people, we do a lot of craft awareness stories. So, we sell a lot through Instagram, Facebook. And a lot of online sales happen." This indicates that she markets to and sells many products to urban individuals interested in crafts, utilizing social media and e-commerce platforms. She further explained that conducting workshops in schools and colleges has helped expand her customer base. P1 noted: "through the workshops we conduct in schools and colleges, that has actually increased our customer base where the students have gone back and spoken to their parents and made them actually log on to different websites and made them buy things." This demonstrates how the workshops educate students who then promote the products to their parents, generating additional sales through referrals. In summary, P1's primary target market consists of urban craft enthusiasts that she reaches through online channels. She also aims to build future customers by teaching students, who subsequently influence their parents to purchase items after learning about crafts in the workshops.

The main buyers of P4's products are a niche audience. She says, "so these are the people who are really passionate and careful about using only organic, natural, healthy, and eco-friendly products will go for earthen cookware or serve wares and all of that. But some of these products are on the expensive side to somebody who's really passionate about traditional crafts and wants to preserve the traditional crafts and wants only a hand-painted utensil from a particular region by a traditional or indigenous maker only." She further adds that the target audience is mostly female between the ages of 20-45 to 65 years old from tier 1 cities like Bangalore, Mumbai, and Hyderabad. P4 mentions that her audience is passionate about using sustainable, organic, and handcrafted products even if they are more expensive than mass-produced alternatives. They want to preserve traditional crafts and support artisans through their purchases.

P5's clientele is versatile, including architects, interior designers, and direct customers. Their products reach customers nationwide, appealing to a broad spectrum of clients. Notably, P5 emphasizes a clientele predominantly on the higher side of the societal spectrum, indicating a

focus on affluent consumers. Architects and interior designers, in particular, are pivotal clients, suggesting an application of their designs in commercial spaces.

In summary, common themes emerge that point to a shared commitment to preserve traditional crafts (P1, P2, P4, P3, and P5). Whether through incorporating artisanal skills into contemporary designs, catering to a niche audience passionate about sustainable products, or emphasizing the high-value nature of crafted items, there is a collective dedication to maintaining and celebrating traditional craft techniques.

Secondly, a modern and adaptive approach to reaching customers is evident in the strategies employed by P1, P2, and likely others. Social media platforms like Instagram and Facebook serve as pivotal channels for marketing and sales, showcasing a contemporary reliance on online avenues to connect with a wider audience. This commonality underscores a recognition of the importance of digital platforms in the present business landscape. These shared themes underscore not only a commitment to traditional crafts, but also an acknowledgment of the evolving nature of business practices, blending traditional techniques with contemporary marketing strategies to reach and engage diverse markets.

However notably, P1 and P2 adopt a strategy that casts a wide net, targeting a broad urban market. In contrast, P4 carves a niche by catering to a specific audience passionate about sustainability, organic products, and traditional crafts. This nuanced approach reflects a deliberate focus on a particular set of values and preferences. Furthermore, P3 introduces a unique perspective, perceiving craft as a high-value, low-volume product. This contrasts with the potentially broader market approach of P1 and P2, indicating a deliberate positioning of crafted items as exclusive and valuable. The market perception articulated by P3 suggests a strategic alignment with the very rich and the very poor segments, steering away from mass consumption targeting the middle class. Additionally, P5's versatile clientele, including architects and interior designers, introduces a business-to-business (B2B) dimension. This distinguishes P5's market engagement from the more direct-to-consumer focus of P1 and P4. The emphasis on a higher societal spectrum in P5's client base suggests a strategic alignment with affluent consumers, reinforcing a nuanced market positioning.

Summary

Most of the participants also asserted that their craft-based products draw significant interest and demand for several key reasons. Firstly, the contemporary design aesthetics stand out, capturing the preference of consumers who seek a blend of traditional craft elements presented in a modern and innovative style. The emphasis on contemporary design, rather than

purely ornamental or traditional, appeals to consumers with a taste for contemporary aesthetics. Secondly, the handmade quality of craft products resonates strongly with purchasers who value the artisanal touch and craftsmanship, distinguishing them from mass-produced, machine-made alternatives. This appreciation for the unique, handcrafted nature adds a layer of authenticity and individuality to each piece. Cultural value emerges as another significant factor influencing buyer decisions. Some clients are drawn to craft-based products not just for their aesthetic appeal, but also for the rich cultural and historical meanings embedded in the crafts. This connection to cultural narratives enhances the perceived value of the products. Furthermore, sustainability plays a pivotal role in attracting some consumers. The conscious choice of these products by some buyers is driven by their sustainable attributes, contributing to the support of artisans and aligning with environmentally friendly practices. This reflects a growing awareness and preference for ethically produced and eco-friendly offerings. Lastly, the ability of all enterprises to offer customization adds a unique dimension to its appeal. Tailoring pieces according to some clients' specific project needs and spaces enhances the personalization and suitability of the products, meeting individual preferences and requirements. Contemporary yet artisanal design approaches, coupled with attributes such as cultural value, customization options, and a growing emphasis on sustainability, are all factors which collectively contribute to the demand for the products these enterprises cater to.

5.1.4 Transformation of craft into contemporary products

P1's engagement with traditional crafts is marked by a strategic and thoughtful selection process, driven by a commitment to craft revival and economic empowerment of artisans. Initially concentrating on crafts like Chitrakathi, Rogan painting, and copper enamelling, the organization aimed to revive crafts that were at risk of fading away. For other crafts, she mentioned "Gond and Pattachitra, these crafts are not dying anymore, but there are very few master artisans who are able to earn their living through these crafts, second level third level artisans, they hardly get any money through this." More recently, P1 explained they assess "where government and a whole lot of NGOs have started craft or livelihood initiatives in villages, these are at scale where they want to impact 1000, 2000, 5000 people within that area, but the value chain is completely broken." Her organisation helps fill gaps in such programs to strengthen livelihoods. In summary, P1's choice of crafts is a dynamic and informed process, guided by a multifaceted commitment to craft revival, economic empowerment, and addressing systemic challenges within the craft ecosystem. In summary, P1 follows a systematic process when choosing crafts to work with and then determining suitable products. She first looks at

reviving endangered crafts practiced by only a few families, or supporting lesser known artisans within active crafts. This is to preserve dying traditions or help those struggling to earn livings. Then she tries to understand the craft's traditional products, artisan skills, materials used and identifies gaps like outdated designs or untapped markets. P1 then designs contemporary products that fill these gaps, ensuring utility and appeal for modern lifestyles to generate demand. The artisans are involved to provide feedback on designs and feasibility of production methods. This helps create new revenue streams within crafts while addressing the evolving needs of customers. By thoroughly analysing each craft and co-creating products with artisans, P1 is able to identify viable product lines that strengthen livelihoods through revived cultural traditions.

P3 sheds light on the organization's diverse engagement with various crafts, emphasizing bamboo, terracotta, paper, stone, and jewellery. The selection of these specific crafts reflects a nuanced approach that combines the needs of craftspeople with market demands. The founder discussed a recent collaboration with jewellery craftspeople, a connection forged during the pandemic when artisans in this field were grappling with unemployment and came to them asking for work. This collaboration exemplifies enterprise's adaptive and responsive strategy, showcasing a willingness to engage with crafts based on the evolving circumstances faced by craftspeople and the demands of the market. P3 notes, "It's kind of a two-way process. So, it's not that I only want to work with these crafts; I would like to work with many more crafts. But it's just happened that these are the ones who come in my trajectory as of now." This insight underscores that the selection of crafts is not predetermined but evolves organically through collaborative processes. In summary, P4's choice to work with particular crafts is based on a two-pronged approach - addressing the needs of crafts seeking support, as well as market viability of products different crafts can offer, through an organic selection process. The decision to work with specific crafts aligns with P3's overarching mission of supporting crafts facing challenges and addressing market needs concurrently. When deciding what products can be made using a particular craft, P3 mentioned they work closely with the craftspeople through a collaborative process. They assess the crafts people's unique skills, materials used and production capabilities for the craft. Then market research is done to understand potential target segments, price points and product attributes in demand. Brainstorming sessions are likely held with craftspeople to leverage their traditional knowledge and identify new product concepts. Later, prototyping and testing is done to finalize viable, sustainable product designs that match market needs. Considerations include cultural aspects, using materials sensitively, and ensuring economic viability for craftspeople. She mentions, "the goal is to develop

innovative, customized products that boost livelihoods through demand while respecting the craft's integrity." By involving craftspeople closely, P3 aims to determine the best product portfolio leveraging each craft's full potential for identified sustainable business opportunities.

P4 exemplifies a profound commitment to the ancient artistry of terracotta, underpinned by a passion for preserving traditional crafts. The brand's focus on terracotta as its primary medium is rooted in a profound recognition of its historical significance and versatile artistic applications. P4 states, "Terracotta, with its roots deeply embedded in our cultural heritage, allows us to forge a meaningful connection with the past while simultaneously creating timeless pieces for contemporary living." Within the realm of terracotta craft, artisans employ a rich array of techniques, ranging from the tactile intimacy of hand moulding to the precision of wheel throwing and the intricate artistry of hand-carving. P4 emphasizes this dedication, asserting that "our emphasis on handmade craftsmanship is not just an aesthetic preference; it's a profound commitment to preserving the human touch and cultural value inherent in every handmade product." The choice of these specific crafts is not only an artistic decision, but also a strategic one aligned with P4's sustainability ethos. "Our choice of terracotta is a conscious decision to promote sustainable practices and minimize our environmental impact, ensuring that each creation reflects a harmonious coexistence with nature." (P4). Additionally, she also explores and collaborates with other crafts like Madhubani hand painting, Dhokra art, Logpi black pottery, Lippan art etc. This not only broadens the artistic scope of their collections, but also signifies a profound commitment to celebrating and preserving India's diverse cultural heritage. P4 reflects on this expansion, noting, "Our foray into different traditional crafts is a deliberate effort to contribute to the rich tapestry of India's artistic legacy. It's about honouring the artisans and keeping the flame of our cultural heritage burning bright." She aims to preserve such indigenous crafts while promoting their cultural significance and sustainability aspects. P4 takes a two-pronged approach to deciding on products. Once a craft is selected, P4 explores its traditional techniques and motifs/designs to decide on suitable contemporary product categories. For example, with Longpi pottery she focused on cookware and serving pieces. With Lippan art, she translated the tile carving into wallets, lights etc. She aims to introduce new designs made exclusively for her brand while maintaining the craft's authenticity through curation of existing pieces as well.

P2 provided insights into the crafts her business works with and how they select the crafts, she mentions, "we work with very closely with about 15 art and craft forms, out of which six are art forms and the rest nine are craft forms." Some key crafts include "copper enamels, brass casting called Dhokra, the Lippan art, which is the mirror work from Kutch, the Thikri art, which is from

Rajasthan, which also uses mirrors, terracotta and some extent wrought iron craft." Her team strategically chooses the crafts they work with based on certain key criteria. It is evident that scalability, interpretability, proximity, material focus, and showcasing unique skills are important factors in her selection process. She looks for crafts that have potential for scaling up production capabilities while also allowing reinterpretation in contemporary design styles. The crafts are preferably located nearer to her operations to enable easier collaboration with artisans. They also concentrate on intensely developing the techniques of a select few crafts over time. P4 is drawn to craft forms that demonstrate highly skilled, yet underutilized craftsmanship across India. To effectively work with the chosen crafts, she adopts an approach involving close communication, training support, and collaborative craft production suited to her firm's design approach and growth objectives. This thoughtful selection and engagement process have enabled P4 to identify crafts well-positioned for the scale and vision of her company's contemporary craft-based products and projects. Copper Enamels take centre stage in the company's projects, with a focus on collaboration with craftspeople in Maharashtra. P4 emphasizes the innovation within this craft, stating, "we have worked with the copper enamel craftspeople in Maharashtra and really innovated their products."

Similar to the other designers, P5 works with various Indian crafts through her design practice. When discussing the crafts, she has explored, P5 provided some insightful details. On weaving she said, "we have a collection of it and it is an ongoing conversation right now, we have a list of about almost 40 to 50 products, we've just launched five, and of course, the others we are building and prototyping, so it takes a while. We are developing from lighting solutions, textiles, kitchen objects, and some other objects." On stone carving she said "India being rich with its own materials, like we try to find these materials to work with and promote them." On metalworking she mentions "we have a lot of industrial machinery available. But here, for example, we do have as simple as a blacksmith, and has this incredible art of forming a rod of iron using just a hammer, we like to work with these types of crafts." On woodworking she indicated "we use only reclaimed teak wood at the moment, and then we are trying to find other local species." She looks for crafts using local, sustainable materials and those less commonly used in design to bring new character. The crafts must suit contemporary lifestyles, as indicated by her. P5 follows a thorough process when choosing crafts to design products her firm sells. She begins with research trips around India to discover local crafts and materials, such as a trip to Kerala that uncovered coconut wood crafts. Once a craft is identified, she selects those that utilize sustainable, locally sourced materials that have unique properties worth showcasing, like coconut wood. She then assesses if the craft is still relevant for contemporary

lifestyles, and will look to simplify techniques if needed for modern contexts. After selecting a craft, P5 brainstorms potential product applications that could feature the craft, such as exploring coconut wood for furniture. She then begins prototyping different product concepts to test how the craft can be applied, which she noted is an ongoing process as they refine ideas. This allows her to thoughtfully choose crafts based on their materials and design potential before developing prototypes that put the crafts in new product applications.

Summary

In summary, while all enterprises work with a variety of crafts, each has a unique emphasis. They all consider a range of factors while selecting crafts they work with, including cultural significance, economic empowerment, market viability, and sustainability, when selecting crafts. Enterprises consider the holistic impact of their craft choices on both artisans and the market. All the designers and their enterprises share a commitment to the revival of traditional crafts. They actively engage in preserving dying traditions, supporting struggling artisans, and addressing systemic challenges within the craft ecosystem. Innovation within crafts is another shared aspect among all designers. P1 designs contemporary products to fill gaps and generate demand, showcasing innovation in product development. P3's emphasis on developing innovative, customized products aligns with market demands. P4 innovates within terracotta, employing various techniques to create timeless pieces. P2 actively engages in developing the techniques of selected crafts over time, fostering innovation. P5's ongoing conversation and prototyping process reflect a commitment to continuous innovation within the chosen crafts.

Collaboration with artisans is a recurrent theme across these enterprises, with craftspeople actively participating in the selection and crafting processes. The engagement involves seeking artisan feedback on designs, evaluating production capabilities, and co-creating products that seamlessly blend tradition with modern appeal. Additionally, there is a shared strategic approach to both craft and product selection, involving an initial assessment of a craft's traditional aspects, identification of market gaps, and the subsequent design of contemporary products to meet modern lifestyle needs.

Sustainability emerges as a guiding principle uniting these enterprises. Whether through P4's emphasis on terracotta for its eco-friendly nature, P5's focus on local, sustainable materials, or P1's involvement in filling gaps in government-led initiatives, sustainability consistently informs their decisions. However, distinctions arise in the unique emphases of each enterprise. While all engage with various crafts, P1 concentrates on specific ones like Chitrakathi, Rogan painting, and copper enamelling. P3's explicit mention of responding to artisan needs during the

pandemic sets it apart, showcasing an adaptive and responsive strategy. P3 also adopts a distinctive two-pronged approach, simultaneously addressing crafts' needs for support and ensuring the market viability of products. P4's singular focus on terracotta as a primary medium, driven by historical significance and sustainability, distinguishes its commitment. P2 provides a more detailed insight into its craft selection criteria, explicitly mentioning scalability, interpretability, proximity, material focus, and the showcasing of unique skills.

5.1.5 Navigating Challenges in Craft-Design Collaborations

When asked about design barriers faced, P2 highlighted several key barriers her firm faces in designing with crafts. On technical literacy, she noted "many of them (artisans) do not have the capability to interpret drawings or specs that are given." Regarding timelines, artisans "sometimes stretches and it's hard to get, you know, stuff out in in the timelines given." Scaling abilities are also a challenge, as "possibly their ability to scale and how many people they have and you know, how much more can they do?". She emphasised that interpretability is difficult as "not all crafts are interpretable in a contemporary format, because some of them are very specific." P2 mentioned artisans may lack "exposure to reading technical drawings or understanding what is it that we are trying to create." Lastly, she noted that challenges are different in terms of artisans and consumers, "to change mindsets is sometimes very tough" given entrenched traditional ways of working.

Overcoming the design barriers posed by low artisan literacy and other challenges is crucial for P2's collaborative model. Her firm adopts a nuanced approach leveraging both visual and personal communication methods. "Sometimes paper models and actual swatches have to be created...might actually have to send a swatch of the colour, might actually have to send a paper model," she notes. On-site engagement helps explain complex designs. Programmatic interventions like mentoring through "Hand for Handmade" initiative aim to boost artisan capabilities over time. P2 also emphasizes understanding "their production limitations and working out ways and means by which they can get something produced." By ensuring "consistent work orders," artisans can better meet timelines. Adapting "flexibly" to each craft's uniqueness is equally important. Through open communication and a tailored blend of visual, training and market support initiatives, P2's enterprise actively works to bridge cultural and technical divides - a process requiring long-term commitment reflected in P2's goal of "intensive communications." This nuanced, multifaceted approach seeks to empower artisans as collaborative design partners.

P4 responded that she finds it difficult to place large bulk orders to get better prices from artisans due to the nature of her business. This increases product costs. Additionally, prices also increase due to the fragile terracotta products incurring high packaging and shipping expenses, especially for smaller orders. However, P4 adds "I am fortunate to be working with very skilled artisans so these are mostly master craftsmen and they have received awards and recognitions from the government and they are able to translate my sketches on paper with just marks written and they are able to translate it as it is into products." She faces minimal barriers in design translation due to the expertise of artisans she collaborates with. The key challenge remains optimizing production processes and costs to make crafts commercially viable at scale.

When asked about barriers faced in craft-design collaborations, P3 provided insightful perspectives based on her experience. She mentioned that one of the greatest barriers is lack of trust in designers by craftspeople, as many make promises but don't follow through on documentation or benefit-sharing. P3 also mentioned "there is a barrier in the sense that people think that crafted products would be less performing somehow less standardized, somehow inferior to industrial things." However, she disagreed, citing an example of an intern realizing "craft can be more precise, perhaps than industrialization." On the power imbalance, she observed "the designer feels that they are a superior, or they think that they're doing something very good by doing this, which is a model I don't agree with." She further explained "I think the designer has only things to take from craft rather than contribute. In fact, the craftsperson probably just has to work their economics and some kind of updating of market knowledge but the designer has far more to take in the exchange."

While designers acknowledged various barriers in craft-design collaborations, such as power imbalances or lack of trust, it is essential to consider how artisans might perceive these dynamics differently. For instance, some artisans may view collaborations with designers as intrusive or overly directive, limiting their creative freedom. Additionally, they might feel that the contemporary interpretations introduced by designers often overlook the cultural or symbolic nuances intrinsic to the craft. Artisans may also perceive the commercial focus of collaborations as prioritizing market trends over the preservation of traditional knowledge. These perspectives underline the need for equitable partnerships where artisans' voices are not just heard but actively shape the collaborative process.

P5 faces some challenges in her design process. Finding skilled artisans is difficult, it can be challenging to find one artisan who can work with new materials well and train others. As she mentioned "once you like a certain craft or a particular material, finding one person who can do

it right, and who can probably work with you for a little bit till you are trained, and then you can train somebody else is usually how the processes but it takes a long time." Experimenting with new craft applications through prototyping is also time intensive, as she noted their process is "ongoing." Many traditional crafts are no longer economically viable due to labour intensity, and artisans are not earning sufficient livelihoods. Which P5 acknowledged saying "these crafts used to be labour intensive. So, it is not sustainable in that sense, the number of hours that you put in to that and the outcome or how much you can sell this particular object for." Some crafts need simplifying while retaining cultural essence for modern contexts, a challenge P5 aims to address through her design approach. She also mentioned, sourcing local materials consistently to meet quality and volumes can also be difficult. Another barrier she faces is evolving consumer tastes which also needs to be considered as designs are developed and refined.

P1 faces several barriers in designing sustainably for crafts. She mentioned that unfortunately, there is a loss of traditional knowledge over time, especially regarding natural dyes and processes. It is difficult to replicate techniques not properly documented. She provided the example of trying natural dyes for golden grass craft but "it didn't work, the only colour which was working well was chemical and this reliance on chemical dyes/materials now as natural options are harder to work with and not always viable at scale." She also pointed out that some designers have very Individualistic approaches and some designers don't sufficiently involve artisans, undermining feasibility and cultural nuances. This "slows down the process for the artisans." Additionally, lack of acknowledgment for artisans is a challenge and their contributions is not acknowledged when their work is used, affecting dignity and motivation to continue crafts. She asserts when companies use artisan work "their designer is also not known. And the artisan is also not. So basically, it's a big roadblock." She also added, working in isolation versus cluster-based models seen in other countries, impacts productivity and economies of scale. Limited awareness among customers and next generations about crafts, makes it challenging to create sustained demand. In her pursuit of overcoming design barriers, P1 employs a multifaceted approach that embraces collaboration and empowerment. Engaging in collaborative research and development, she forges partnerships with artisans, esteemed design institutions and NGOs, aiming to delve into traditional knowledge for sustainable solutions. Notably, artisans should stand as equal partners throughout the design process, ensuring cultural appropriateness and feasibility for large-scale production. P1 is committed to empowering artisans through various means, including training, financial support, and initiatives like royalty models that duly acknowledge their invaluable contributions. Adopting a cluster-based approach, she strengthens entire value chains, spanning from design to marketing,

thereby achieving scalability and viability. Furthermore, she actively promotes awareness through workshops and exhibitions, serving as educational platforms for new generations of customers and contributing to the sustained demand over the long term. Embracing hybrid models that leverage both NGO and for-profit arms, she not only provides livelihoods at scale but also ensures commercial success in selling products. Notably, she addresses existing gaps in government programs by tailoring interventions to the specific needs and capabilities of artisan clusters.

Summary

In summary, this section sheds light on the multifaceted challenges faced in the collaboration between traditional crafts and contemporary design. These challenges encompass technical literacy, timelines, scaling abilities, interpretability, pricing perceptions, cultural mindsets, and issues in trust and power dynamics. However, the artisans and designers are actively working to overcome these barriers through collaborative models, nuanced communication methods, training initiatives, and programmatic interventions. Each designer brings a unique perspective, emphasizing the importance of trust, recognition, sustained efforts to bridge the cultural and technical divides, optimizing production to sustaining crafts. The insights gleaned from these provide a comprehensive understanding of the dynamics involved in navigating the delicate balance between tradition and innovation in the world of design and crafts.

5.1.6 General perspective on the role of design in supporting traditional crafts

When asked about the role design can play in supporting traditional crafts, P3 provided thoughtful insights based on her experience. She began by explaining how craft enterprises and systems are increasingly requiring flexibility and customization to adapt to changing needs. On this, she noted "Design can help craft enterprises and production systems manoeuvre towards customization in a sustainable way." P3 also observed how the designer's role is shifting, saying "the control of a large part of the design is actually not in the hands of the designer." She referred to this emerging approach as "meta-design" where designers provide customizable "building blocks" for others to build upon. In addition, P3 saw value in design acting as a "coordinating body" that can quickly help craft-based groups adapt solutions through customization templates in response to market needs. However, she cautioned that for meaningful partnerships, "the designer has only things to take from craft" in reciprocal knowledge exchanges. She emphasized design must approach crafts respectfully without

assumptions of "improving" them, and acknowledged the need for the field to understand non-Western knowledge frameworks before engaging craft traditions. Only through such an equitable, culturally-sensitive approach can design play a supportive role in sustaining crafts and their knowledge systems over time.

P5 believes design has an important role to play in supporting India's rich traditional crafts. She discussed how many crafts are no longer economically sustainable due to being very labour intensive. As she noted, "these crafts used to be labour intensive. So, they are not sustainable in that sense, the number of hours that you put in to that and the outcome or how much you can sell this particular object for." With many craftspeople no longer able to make a viable living, these cultural skills risks being lost. However, P5 sees opportunity for design to help revitalize crafts. She thinks designers can aid crafts by "retranslating them or adapting techniques in a more simplified way." In her view, design has the power to modernize crafts in a way that streamlines processes while maintaining cultural integrity. She also stated the crafts sector needs "a design sensibility that the craft community needs to grow with, if they need to sustain." This reinforces her belief that design can support crafts' evolution and sustainability over time by finding new applications and markets. Through her work she aims to demonstrate how design can collaborate with craftspeople to reinterpret traditional skills for contemporary audiences and contexts. By bringing crafts innovative exposure and appreciation, she hopes to not only preserve cultural heritage but also enable craftspeople to make viable livelihoods from their intergenerational knowledge.

P1 shared insightful perspectives on the important role of design in supporting traditional crafts. She began by explaining her view that "the role of design is to identify the problem." Designers need to analyse each craft thoroughly to understand any issues. As P1 stated, problems could include things like "motives are not updated, it could be technology is not updated, it could be the products because these days people want to have handmade products, but it has to have some utility." She emphasized that design intervention is critical at this stage. It allows one to "figure out what are those missing links." Only then can appropriate solutions be developed. P1 also feels both artisans and designers must change their approach to be more collaborative. Most designers work very "individualistically" but this "slows down the process for the artisans." In her opinion, design has an important role to play in ensuring crafts can evolve while maintaining cultural significance. She believes with the right interventions, design can help address challenges and unlock new opportunities that strengthen livelihoods. By thoroughly understanding issues and co-creating appropriate responses, design can play a vital supportive role for traditional crafts, in her experienced view.

P2 also believes design has a significant role to play in supporting India's rich traditional crafts sector in a sustainable manner. She outlined several ways in which design can contribute based on her experience working with crafts communities. On the aspect of interpretation and innovation, P2 stresses that design must "interpret crafts in contemporary and innovative ways to make them relevant to modern design." This allows crafts to reach new markets and scale production. When it comes to communicating designs effectively, she notes the need for "intensive communication using models, videos, and on-site visits" given that "many artisans do not have the capability to interpret drawings or specs." P2 also highlights how design is well-placed to support craft production techniques through "engineering craft production techniques and helping artisans increase their capabilities." Promoting crafts via contemporary design projects can help "sustain craft skills and artisan livelihoods over the long run," she believes. She remarks, an important role of design involves "educating consumers and changing perceptions about the value of handmade crafts." Lastly, she emphasizes the importance of designers "collaborating closely with craft communities" through training and market linkages.

P4 also shared some insightful views based on her experience. She began by noting that traditional crafts like terracotta pottery have "been sustaining for a long time on their own", as a craft like terracotta has continued for generations without external design intervention. However, she believes "design can play a role in growing and developing crafts further while not moving away from their roots." As a designer, she aims to introduce new designs sensitively without compromising on craft techniques and materials. Working with artisans, P4 tries to create designs "that artisans make exclusively for her brand." At the same time, she also curates "existing crafts to showcase their diversity." This allows her to showcase the range of crafts while introducing new product categories. P4 feels design can help "crack bigger bulk orders for artisans by strategically positioning craft products." For example, through experience centres as she envisions, to help artisans "sustain and continue their crafts." Her perspective, as she states, is that "design should learn from and support traditional knowledge, not dictate changes to crafts." P4 strives to utilize design in a way that enhances rather than replaces craft expertise.

Summary

The collective insights from designers illuminate the significant role that design plays in the preservation and evolution of traditional crafts. Design acts as a dynamic force, addressing problems, fostering collaboration, interpretation, effective communication, and market positioning. All the designers emphasize the importance of respecting craft traditions, ensuring equitable partnerships, and leveraging design for the economic sustainability and cultural

preservation of traditional crafts. Design is seen as an adapting to changing needs and fostering sustainability. Collectively, these perspectives underline the multifaceted role of design in navigating challenges faced by traditional crafts. From customization and innovation to communication and education, design emerges as a crucial force supporting the sustainability and evolution of traditional crafts while respecting cultural roots.

5.1.7 Contributions of craft practices to sustainability

The crafts that P5 works with make important contributions to sustainability through their materials, techniques, and cultural significance. She notes that many crafts inherently utilize "locally sourced natural materials found within specific regions." For example, she discussed exploring "coconut wood or palm wood, in architecture, really, but it does lend certain properties" from her research in Kerala. By sourcing materials locally, transportation impacts are reduced compared to imported goods. In addition, traditional craft techniques tend to be "less wasteful manufacturing processes." P5 observed that woodcraft artisans in particular "fully use offcuts and scraps," minimizing the material waste produced. She has also noted how certain crafts like hand-woven textiles have "stood the test of time due to their durability" when properly cared for, producing products with longevity when used. P5 sees another key sustainability benefit in crafts providing "economic opportunities that help sustain traditional skills as viable livelihoods." Through her work adapting craft applications, she aims to make practices "relevant to modern needs while retaining cultural significance, supporting their long-term sustainability." By celebrating "India's diversity of crafts," she also hopes to foster cultural appreciation of indigenous knowledge and resources among consumers.

P1 shared insightful perspectives on how crafts inherently contribute to sustainability. She began by explaining how "India has always had sustainability practice" as evident from traditional village systems. As she quoted, "there were these 12 crafts, which were very essential to start a village and the whole idea was you should not go out of village for your basic needs." This highlights how crafts historically met local needs through locally available resources. P1 also noted that crafts use "local material, which is available there. So that sustainability angle is there." By employing local artisans close to resources, they minimize transportation costs. She finds this in contrast to modern "sourcing material from Andhra Pradesh coming to Rajasthan for some craft process work there, which then goes to Delhi or then comes to Bombay and then gets shipped somewhere else." Furthermore, craft production being small-scale creates "minimal waste." P1 believes crafts and agriculture earlier had a

symbiotic relationship per local conditions. Through seasonal integration of occupations and circular product use, traditional craft systems incorporated sustainability philosophies in her view.

P3 provided insightful perspectives based on her experience. She stated that "most crafts are done from renewable materials sourced locally from the earth. So, they're fundamentally and ecologically sustainable." She elaborated that craft production also typically relies on "renewable or natural energy sources, because crafts were born in a time where they didn't have access to different sources of unsustainable energy." This demonstrates the inherent ecological sustainability of crafts. P3 further explained that socially, "it gives a livelihood to localized groups, which is something wonderful" as crafts preserve cultural knowledge for future generations. Regarding economic sustainability, she noted craft micro-enterprises "help sustain families." She also highlighted the cultural sustainability of crafts, saying they "perpetuate knowledge systems to be carried forward, which is really good" through transmitting inter-generational knowledge about history and places through living artefacts. Overall, P3 concluded that "I think that craft in totality is very sustainable" as it holistically addresses ecological, social, economic and cultural pillars of people and planet-centred sustainability by its very nature and traditions.

P4 shared her insights based on both her design background and experience working with artisans. She noted that "terracotta is made from natural clay which can turn back to clay." As she explained, "terracotta pot, if put into mud will turn back to clay and it does not take much longer and it is not toxic." This underlines how terracotta is a fully sustainable material that can degrade without harm. P4 also pointed out that using terracotta products "helps us lead sustainable lives" as "there's nothing leaching into our food when we are cooking in it, or we are serving in it or drinking out of a glass or a bottle." This allows for healthy lifestyles with no chemical exposure. Importantly, working with terracotta crafts helps "sustain artisans " and endangered traditions. Additionally, rural communities still "ate out of paper, leaf platters, which are biodegradable, there was no chemical, no plastic, so we were always sustainable as a society." Craft's knowledge of cultural roots-based sustainability is valuable.

Crafts make a significant contribution to sustainability in various ways, as highlighted by P2. She noted that working with crafts helps sustain artisans' traditional "way of life and helping people to stay in their own villages or homes and earn from that." This preserves important social and economic structures. P2 also emphasizes that crafts deeply embed cultural meanings and histories. "Every craft is so deeply embedded with the cultural influences that existed across the

eras," she remarks. Sustaining this intergenerational exchange supports cultural sustainability. Certain craft techniques utilize natural resources and low-impact processes. She references traditional "natural dyes or some of these organic" approaches that promote environmental sustainability when supported. Community-oriented production is also valuable - "how artisans think, differently, and working on crafts gives them a lot of satisfaction and happiness, to live that way of life." This social cohesion aids well-being. P2 believes engaging with crafts impart important "learnings in just understanding culture and communities." Preserving this cultural education role ensures more holistic sustainability. Moreover, "livelihood generation for women is also an important aspect for crafts," she notes. Crafts thus also contribute economically by supporting equitable livelihoods.

Summary

Indian designers working with traditional crafts highlight how these crafts significantly contribute to sustainability through multiple dimensions. Crafts utilize locally sourced natural materials, such as coconut wood and palm wood, reducing transportation impacts and embodying ecological sustainability. Traditional techniques minimize waste by fully utilizing offcuts and scraps, and products like hand-woven textiles are durable and long-lasting. Crafts also support economic sustainability by providing viable livelihoods for artisans and sustaining traditional skills, while fostering social cohesion and well-being within communities. The use of non-toxic, biodegradable materials, as seen with terracotta, promotes healthier lifestyles. Moreover, crafts embed deep cultural meanings and histories, facilitating intergenerational knowledge exchange and cultural education, thus supporting cultural sustainability. By integrating traditional practices into modern needs, crafts sustain cultural significance and preserve endangered traditions.

Traditional crafts emerge as sustainable practices that extend beyond ecological considerations. Their contributions encompass social, economic, and cultural dimensions, making them pivotal for a more holistic and enduring sustainability paradigm. Preserving and promoting traditional crafts becomes not only an environmental imperative but also a cultural and societal responsibility. These insights underscore the holistic sustainability of traditional crafts, emphasizing their integral role in fostering ecological balance, economic viability, social cohesion, and cultural preservation, thereby supporting a more comprehensive approach to sustainability.

5.1.8 The consideration of sustainability aspects while designing

When asked about the sustainability aspects considered in her design process, P4 delved into the various factors guiding her approach. She emphasized using "only natural and degradable materials like terracotta clay, natural dyes and colours, paper, etc." To this end, she noted focusing on "low-fired terracotta which can degrade naturally, rather than high-fired ceramics which become non-degradable." P4 also strives to create "products meant for long-term use like wall decor, serving pieces instead of disposable items to reduce waste." She pointed out involving "artisans and learning from traditional craft knowledge systems attuned to roots-based sustainability." A key consideration is designing solutions that "utilize artisans' existing skills and techniques rather than introducing disruptive changes," P4 mentioned. She adopts eco-friendly practices for "all stages from production and packaging to marketing, involving only corrugated paper, recycled materials." Additionally, P4 educates consumers about "the craft origins and sustainability impact of their purchases through product stories." Overall, her approach aims to holistically integrate sustainability from concept to consumer experience.

P2 takes a comprehensive approach to considering sustainability in her company's design process. She provided insights into the various aspects examined. On sourcing and community support, P2 notes the importance of "ensuring that artisan's views are taken into consideration and the designer understands their production process." This fosters social and economic sustainability. When asked about materials, she referenced exploring options like "natural dyes or some of these traditional techniques, which were very organic." Preserving such ecological craft knowledge is important. P2 also highlighted engineering production "into our systems as we go along. Remember, to look at application processes for sustainability." Constantly improving techniques is a priority. Educating consumers is another key focus, as "the consumer has to really lead this battle." P2 believes driving sustainable purchasing can positively impact artisan livelihoods. Overall, P2 adopts a holistic lens that looks "at it from multiple perspectives," from social well-being to environmental stewardship.

When asked about how she considers sustainability aspects while designing, P3 delved into her approach thoughtfully. She began by stating that at her organisation, "we look at social, economic, cultural and ecological aspects" of projects. However, she was quick to note they "don't consider them to be equally weighted in each project" due to varying contexts. P3 went on to explain their process, quoting "right from deciding what resources they want to how to process the resources to how to assemble primary processes in secondary processing, transportation, distribution, packaging, use and end of life." This demonstrated their holistic,

systems-level view of sustainability across a product's entire lifecycle. She emphasized tailoring the specific focus based on "the project situation and contexts" through stakeholder consultations. The goal, according to P3, is to design with "minimized negative impacts and foster well-being" simultaneously across the social, environmental and economic dimensions pertinent to each project scope and community needs. Overall, P3's narrative revealed her organisation's considered approach to sustainability that weighs multifaceted impacts through each phase, rather than focusing on isolated metrics or trade-offs alone.

When designing products, P5 carefully considers a range of sustainability aspects based on her research and experiences. As she noted, "sustainability is 100%" of her process. Materials selection is a key focus, with P5 emphasizing the use of "locally sourced natural materials." She looks at how items can be "easily repaired" and eventually "recycled versus trashed." Energy efficiency during use, like natural ventilation, is also assessed. Importantly, P5 sees collaborating with local artisans as both an environmental and social sustainability benefit. Working with craftspeople "provides economic opportunities" and helps "sustain traditional skills as viable livelihoods and a community's cultural heritage for the future."

P1 pays close attention to various sustainability aspects when designing products for crafts. She mentioned that sustainability is "very, very important" and something she considers thoroughly at each stage. During the design process, P1 aims to "make sure that each stage addresses the sustainability." As she explained, material selection is key - "we don't use any plastics for packaging, unfortunately, we are selling through E commerce, so we have to have all those boxes, but we use only the recycled corrugated boxes." Production methods are also tailored for artisans as "these are designed keeping small-scale artisan capabilities in mind." P1 emphasized the importance of local sourcing - "most of them are local. But as I said that if there is any specific thing like for copper enamelling the glass colour is available in Mumbai market also, but you get better quality in Amritsar." She finds this better than "forcing material from Andhra Pradesh coming to Rajasthan." Through collaborative working and cultural respect, P1 aims to integrate sustainability at all stages. She strives to empower communities while minimizing environmental impacts and maximizing longevity of craft traditions and products.

Summary

Despite variations in their approaches, all designers share a commitment to sustainability, emphasizing local materials, long-term product use, artisan involvement, and consumer education, sustainability is interwoven into every aspect. Each brings a unique perspective, contributing to a rich tapestry of sustainable practices in the realm of traditional crafts and

design. P3's systems-level approach stands out as a comprehensive model, while P2's focus on consumer-led sustainability adds a unique dimension. The differences in their strategies showcase the diverse ways artisans can integrate sustainability into their design processes. These designers serve as stewards of both cultural heritage and environmental responsibility, emphasizing the importance of holistic, context-specific, and community-centric sustainability in the world of design and craft.

5.1.9 Barriers while designing sustainably

Designing sustainably for P2 presents notable barriers. She highlights challenges like artisans' low literacy levels, which can impede their ability to interpret drawings or specifications. Scheduling unpredictability and limited production capacity also pose significant constraints. P2 mentions the difficulty of fairly pricing handmade goods, often perceived as "cheap," and acknowledges that "changing mindsets is sometimes very tough" in deeply entrenched practices. Overcoming these hurdles demands intensive communication, visual aids, and collaborative engineering of craft workflows.

P4 faces challenges securing larger orders, as the inability to provide bulk quantities prevents her from obtaining bulk prices, increasing costs. The nature of terracotta products also adds to expenses due to packaging and shipping. COVID-19 restrictions have further limited her ability to source directly from artisans. Educating consumers to increase demand for traditionally crafted, higher-priced goods also poses a barrier to sustainable design scalability and viability.

P3 identifies "greenwashing" as a significant barrier, making it difficult for genuinely sustainable design endeavours to succeed. She also mentions the perception that "sustainability will either be more expensive or underperforming." P3 highlights the challenge of proving sustainability impacts due to the "lack of verifiable data on how development interventions actually impact communities in the long run." Resource constraints necessitate prioritizing impacts for different project scopes and communities. She acknowledged that knowledge about sustainability is "mostly always incomplete," requiring constant learning and adaptation.

P1 notes the loss of traditional knowledge, such as the use of organic dyes, as a significant barrier. She also points out the challenges of individualistic design approaches and the lack of acknowledgment for artisan contributions. Working in isolation instead of cluster models impacts sustainability goals. P1 aims to address these barriers through collaborative solutions and initiatives to strengthen value chains and communities.

P5's major challenge is finding artisans with niche craft and material skills, additionally she mentioned securing reliable supplies of local, sustainable materials at production scale can be challenging. Experimenting through prototyping new craft applications requires significant time commitment. Ensuring crafts remain "viable livelihoods" is another challenge, as many were previously "labour intensive" without adequate income potential. Sourcing local materials consistently at production scales and evolving consumer tastes also present hurdles. P5 works to overcome these barriers through a research-driven, collaborative approach.

Summary

While each designer faces unique challenges, common barriers include limited artisan capabilities, logistical constraints, greenwashing, loss of traditional knowledge, and market dynamics. Overcoming these challenges requires intensive collaboration, education, and innovative approaches to integrate sustainability into design processes while preserving cultural heritage.

5.1.10 Cultural significance and storytelling: key features of crafts

P3 emphasized that a key feature of crafts is their deep cultural meaning and significance. She explained that crafts are not just physical objects, but living repositories of knowledge, history, and cultural identity. As P3 stated, "in each artefact, it's a living material culture, and it's a living repository of not only original knowledge, but history and geography". This highlights how crafts embody stories, traditions, and cultural wisdom passed down through generations. She further elaborated that crafts reflect "micro bio region" knowledge, adapting to local conditions over time. For example, P3 noted how in China, the cultivation and consumption of rice "suits the bodies of people who eat it in the bio climatic conditions" - demonstrating how crafts and associated practices are intimately tied to place and culture. P3 contrasted this with industrialized approaches that lack such deep cultural roots, saying crafts preserve "a distinct identity" compared to standardized mass production. By understanding the cultural significance behind craft practices, we gain insight into sustainable, locally adaptable ways of living that have evolved over centuries.

P1 emphasized the cultural significance and stories behind craft practices as key features. She mentioned how many crafts are deeply rooted in local traditions, festivals, spiritual significance and ways of life, giving communities identity and memories. For example, she described a festival called "polar" in Nepal where a particular kitchen set made of terracotta is crafted and purchased. This practice not only provided income for potters during lean months but also had

cultural significance, for Indian context she mentioned "There are a couple of aspects to it. If you see a potter till about June, it means that year's summer is very hot. So, people buy the pots to drink water. After that, the only thing they need is the diyas during Diwali, which comes in October or November." P1 also noted how crafts often tell stories of a region's history, beliefs, and social structures. She gave examples of how certain motifs or techniques in crafts can represent local legends or religious beliefs. Understanding these cultural meanings is crucial for designers working with crafts, as it allows them to create products that respect and preserve these cultural narratives while making them relevant for contemporary markets. P1 stressed that this cultural understanding is what sets handcrafted products apart from mass-produced items, giving them a unique value and appeal to consumers who appreciate the stories and traditions behind the objects they buy.

Similarly, P4 emphasizes the cultural meaning and significance behind craft practices as a key feature. She notes that rural populations have retained many sustainable values and practices through crafts, which urban areas have lost. P4 highlights how crafts like terracotta pottery are deeply rooted in traditional knowledge systems and cultural heritage. She mentions that these crafts have been sustaining for generations, carrying cultural stories and meanings. When designing products, P4 tries to understand and incorporate the cultural significance of crafts. She states that every product they sell "goes with the craft story, so which tells them where it comes from, who has made it, and how they're contributing by buying this product." P4 also points out how everyday objects in villages were handmade and displayed "like beautiful showpieces," indicating their cultural importance beyond just utility. By working with artisans and curating existing craft pieces alongside new designs, P4 aims to preserve and showcase the cultural heritage embedded in these craft practices. P4's approach demonstrates an understanding that the cultural meanings and stories behind crafts are integral to their value and sustainability, going beyond just the physical products themselves.

P2 notes that "every craft is so deeply embedded with the cultural influences that existed across the eras." This highlights how crafts carry stories and meanings across generations. P2 explains that engaging with crafts allows one to "glimpse into your own history and into your own past." This connection to cultural roots is a key feature of craft practices. She gives an example: "if I look at, a thing like a tree of life, and I see it in a *Madhubani* painting, and I also see it in a *Warli* painting, and I also see it internationally, you kind of join the dots." This illustrates how crafts embody shared cultural motifs and beliefs, with similar motifs appearing across different craft traditions, suggesting common cosmological or spiritual concepts. P2 also mentions that for some communities, like the *Warli* tribe, their art "is the only way to communicate in a written

way." This underscores how crafts can serve as a form of cultural expression and preservation of knowledge. P2 views understanding the cultural stories and significance behind crafts as crucial, stating that "when you look at arts and crafts, you actually glimpse into your own history and into your own, it gives you a context". This cultural learning aspect is a key feature that distinguishes craft practices and contributes to their value beyond just aesthetics or function.

The interview highlights how cultural meaning and stories are key features of crafts in P5's design approach. She emphasizes the importance of understanding the cultural context behind craft practices, stating "we already have a lot of beautiful stories around us, that build our character, and hence this character sort of, is passed on to the object."

P5 sees crafts as carriers of cultural heritage, noting that design should have "more meaning towards it" and tell "good stories" about cultural origins. She aims to create products that are "relevant to how we live today, in our context in our country," showing her focus on cultural significance. When discussing her research trips, P5 mentions looking for crafts that can bring "new character" to designs, indicating her interest in the unique cultural aspects of different craft traditions. She also talks about how certain traditional objects, like the steel lunchbox, are "pretty perfect" because they embody cultural practices and meanings. By incorporating these cultural stories and meanings into her designs, P5 aims to create products that not only serve a functional purpose but also celebrate and preserve India's rich craft heritage. This approach demonstrates how understanding the cultural significance behind craft practices is crucial to her design philosophy and contributes to the sustainability of these traditions.

Summary

The designers share a deep appreciation for the cultural significance and narratives of craft that extend beyond mere utility. P3 highlights crafts as living repositories of knowledge, history, and local adaptations, preserving distinct identities amidst standardized mass production. P1 similarly stresses the cultural narratives and social rituals conveyed through crafts, which enrich their value and appeal. P4 echoes this sentiment, emphasizing how craft practices sustain cultural heritage and community identity through everyday objects and traditional knowledge systems. P2 explores how crafts reflect shared cultural motifs across generations, serving as a vital link to history and cultural expression. P5 underscores the importance of understanding and incorporating cultural contexts into designs, ensuring products resonate with contemporary relevance while celebrating India's diverse craft heritage. Together, these perspectives illustrate that beyond aesthetics, crafts embody narratives that connect communities, preserve traditions, and enrich sustainable design practices with deep cultural meaning.

5.1.11 Design education, emphasis on crafts and sustainability

P5's formal design education in India did not provide significant inputs on sustainability. As she noted, "I did not have any sustainability inputs in my college in India." However, pursuing her master's degree abroad proved highly beneficial in this regard. P5 mentioned living and working in Europe "opened a lot of avenues" and exposed her to "different design cultures." She recalled sustainability being discussed much more openly there. This was exemplified during her European master's program, which included "an entire workshop focused on sustainability." The workshop helped P5 greatly expand her understanding of these important issues. Beyond formal education, P5's visits to craft clusters around India have also aided her sustainability knowledge. Through first-hand research on traditional skills and materials, these trips have proven valuable opportunities to learn outside the classroom. While Indian design programs did not emphasize sustainability, international experience and self-directed study have strengthened her ability to design with such principles in mind.

According to insights from P2, craft cluster visits and modules around crafts play an important role in design education. She emphasized how directly interacting with artisans through visits is invaluable - "meeting artisans wherever I travelled, I was sourcing for the ecommerce." This hands-on exposure aids practical understanding. P2 also stressed during her education introducing students to "the possibilities of using the skills always intrigued me." Modules could showcase India's immense craft diversity and innovations over time. When asked about sustainability contributions, P2 highlighted craft's "livelihood generation for women is also an important aspect." Incorporating such topics builds holistic awareness, according to her. Hands-on projects with artisans moreover helped her appreciate "their production limitations." She believes, immersing in alternative mindsets nurtures cultural sensitivity crucial for community-centric design, as different perspectives must be respected. Overall, such experiential learning rooted in crafts clusters was formative for P2, cultivating deep appreciation that continues to influence her design approach today.

P4's design education at NID ensured extensive exposure to crafts through cluster visits and dedicated modules. As she recalled, students would regularly visit "the local clusters, the terracotta clusters, even the ceramic craft places" as part of the ceramics course. During these trips to study craft techniques on-site, experts like MP Ranjan emphasized sustainable design. P4 remembered him questioning "what you're doing to clays is irreversible? After that, I remember I could never fire something which I was not very sure of." Modules also focused on craft-based concepts. For example, one artisan taught her "it's not just everything you need to

fire and then use it, there are things that you can make out of clay use without firing and then let them go back to nature." Interacting with artisans helped P4 appreciate indigenous forms like terracotta that she continues supporting. The education equipped her with practical knowledge, as she aims to introduce new designs sensitively "without really changing anything in the craft."

When reflecting on her design education, P3 provided some context on craft-related learning during that period. She began by stating that during her undergraduate studies, "I went on to pursue kind of involving craft in my design education." This indicates craft subjects were part of the curriculum there. P3 further noted at NID for postgraduation, "I also continued to work in the crafts." While sustainability concepts were emerging in development circles at the time, she recalled "we didn't even really have the internet, let alone" advanced sustainability discussions in academia. From her narrative, hands-on approaches involving craftspeople seemed part of pedagogy back then. She implied "craft documentation projects involving direct engagement with craftspeople" exposed students to craft clusters. However, P3 acknowledged "it wasn't until I did my PhD" that she gained a deeper understanding of sustainability in relation to "what sustainability was, and what is verifiable and credible."

Finally, while crafts featured to some degree in P3's design education, the interview suggested sustainability studies integrating such community-based knowledge systems had yet to mature during her studies in the pre-internet era.

P1 mentioned that when she was studying at NID, part of the curriculum involved cluster visits and documentation of crafts. She said "we were supposed to do cluster visit and documentation. Which gave me the opportunity to actually go and interact with these artisans." This exposure to different craft clusters and interacting directly with artisans helped inform her understanding of crafts. However, when asked about sustainability education during her studies, P1 said there was little to no focus on it at that time, around 25 years ago. The cluster visits and modules around crafts during her design education at NID seemed to provide some foundational knowledge and interest in crafts, even if sustainability was not yet emphasized as a core concept back then.

Summary

While Indian design education, especially in the past, had limited emphasis on sustainability, hands-on experiences, craft cluster visits, and international exposure played pivotal roles in shaping the understanding and practices of these designers. There is a shared acknowledgment

of the evolving nature of sustainability education in the design field, with later experiences contributing significantly to their sustainable design approaches.

5.2 Design considerations

The narratives shared by the designers highlight several key pathways that contribute to the following design considerations. These considerations build upon the initial themes presented in the previous chapter, deepening our understanding of how traditional practices can inform sustainable design. I revisit these themes in greater depth in the discussion chapter, where their broader implications will be explored.

1. Knowledge transmission

The designers emphasize the importance of preserving and transferring traditional techniques, skills, and cultural traditions. The collective findings underscore how crafts serve as vital repositories of cultural knowledge and skills across generations. Designers emphasize that crafts are "living repositories" not just of knowledge, but also of history and geography. They highlight concerns over the loss of traditional craft knowledge in recent decades and advocate for documenting and revitalizing these practices. Collaboration with master craftsmen is noted as a direct means to transfer skills and knowledge from designer to artisan. Across the board, designers agree that crafts embody profound cultural knowledge passed down through generations, offering insights into personal and historical heritage. They collectively emphasize the importance of learning from artisans and passing down craft techniques to ensure continuity and skill development. Through direct engagement with artisans and integration of craft practices in education, they foster the continuity of knowledge within communities. This supports ongoing education initiatives and mentorship programs that pass down skills and traditions to future generations.

2. Local production-to-consumption ecosystem

Designers advocate for sustainable practices that strengthen local production-to-consumption systems. The collective view among designers is that crafts play a crucial role in utilizing local, renewable materials and energy sources, thereby supporting local economies and livelihoods. They emphasize the historical practice of using locally available materials and engaging local artisans, which fosters self-sufficient village economies. Direct sourcing from local artisan clusters is seen as a strategy to establish short supply chains and foster direct connections between artisans and consumers. Supporting local production chains through collaboration with

artisans and the use of locally sourced natural materials is a common theme. Designers advocate for a localized production-to-consumption model to promote sustainability and community engagement. By collaborating closely with artisans and communities, they promote community engagement, interrelationships, and co-creation. This approach ensures that craft practices remain embedded in local contexts, supporting artisan livelihoods and preserving cultural integrity.

However, interviews reveal an emphasis on artisans adapting to technical specifications, market trends, and production scalability to meet modern demands. While practical, this focus on market-driven practices often neglects the spiritual and cultural values embedded in traditional crafts. Case study findings and the QBL framework highlight the need to shift from preserving crafts solely for market viability to adopting their cultural and spiritual principles. By redefining markets to integrate these values, designers can advance holistic sustainability and create meaningful systemic change.

3. Nurturing cultural meaning

The designers prioritize the preservation of cultural values and rituals surrounding products and practices. They recognize crafts as repositories of profound cultural significance and narratives, resisting homogenization in mass production. By integrating cultural contexts into designs, they ensure that products resonate with cultural identities and celebrate diverse craft heritages.

Designers collectively stress that crafts are not just functional objects but embodiments of cultural identity and traditions. They describe crafts as "living material culture," deeply connected to cultural practices, festivals, and the preservation of stories and traditions. Integrating craft stories into products is highlighted as a way to educate consumers about cultural heritage. Across interviews, designers agree that each craft reflects cultural influences across generations, passing on significant cultural narratives to crafted objects. The shared goal is to nurture cultural meaning by preserving and celebrating diverse cultural heritages through crafts.

4. Transparency and material honesty

Advocating for transparent and ethical practices in material use and manufacturing, designers promote the use of local materials, skills, and minimalistic approaches. This supports sustainability by reducing environmental impact, fostering local economies, and ensuring integrity throughout the production process.

While not explicitly stated by designers, the emphasis on using local materials and traditional practices inherently aligns with principles of transparency and material honesty. They advocate for the use of local, natural materials and involving artisans throughout the design process to ensure authenticity. Some designers promote minimalist design approaches to showcase craftsmanship and emphasize the natural properties of materials like terracotta. The collective emphasis on using natural materials and collaborating openly with local artisans reflects a commitment to transparent material sourcing practices.

5. Longevity and resource consciousness

Designers collectively emphasize the sustainability inherent in crafts, which typically use renewable resources and support long-lasting traditions. They highlight the durability and repairability of traditional craft items, aiming to design products with minimal waste and extended use. Discussions on the biodegradability of materials and the emphasis on repair, reuse, and durability align with principles of longevity and resource efficiency. The shared focus is on promoting sustainable practices that respect resources and contribute to environmental stewardship. By designing products with durability and repairability in mind, they encourage sustainable consumption patterns. This holistic approach extends product lifecycles, minimizes waste, and promotes resource efficiency.

5.3 Summary

This chapter addresses RO 5: To conduct interviews with contemporary design professionals in India to understand their motivations and inclinations towards traditional crafts and sustainable design, by presenting detailed narratives from six contemporary design professionals in India, who share their motivations and inclinations towards traditional crafts and sustainable design. Through their stories, we gain insights into how their passion for craftsmanship, influenced by personal experiences, education, and global exposure, drives their work. The designers emphasize the importance of preserving traditional craft knowledge, collaborating with artisans, and integrating sustainability into their practices.

The interview findings highlight the shared passion of contemporary Indian designers for traditional crafts, influenced by personal experiences, design education, and global exposure. Many have transitioned from diverse professional backgrounds to establishing brands or consultancies, blending traditional craftsmanship with contemporary design to preserve cultural heritage while meeting modern demands. Their work emphasizes sustainability, using natural

materials, fostering artisan collaborations, and integrating crafts into innovative, context-sensitive design solutions.

Despite successes, challenges persist, including scaling production, maintaining authenticity, and navigating market demands. Designers tackle these through communication, training, and collaborative models, underscoring the complexities of balancing tradition and innovation. They advocate for crafts' cultural significance, viewing them as carriers of local knowledge and narratives, resisting homogenization while enriching design with heritage.

The designers emphasize the multifaceted role of design in enhancing sustainability, from ecological to cultural dimensions. They focus on durable, resource-efficient products, systems-level thinking, and consumer education while addressing barriers like limited skilled artisans, material supply issues, and financial sustainability. Their education, marked by hands-on experiences and global exposure, has shaped their approaches to sustainable design.

The findings from the interviews align with and build upon the case study findings in Chapter 4, offering a cohesive understanding of the significance and relevance of traditional practices in contemporary design. Both the interviews and case studies highlight the importance of preserving and transmitting cultural knowledge, the value of local production-to-consumption systems, and the nurturing of cultural meaning through crafts. These insights are consistent with the work of scholars such as Walker (2011b), who advocates for integrating traditional design practices with sustainability principles, as well as Zhan and Walker (Zhan and Walker, 2017) and Bin Mohamad (Bin Mohamad, 2021), who emphasize the role of traditional crafts in enhancing sustainable design outcomes. The interviews also echo the arguments put forth by Mullagh, Walker, and Evans (2019) regarding the importance of creating systems that value local materials, transparency, and authenticity in both production and consumption.

Both the interviews and case studies also stress the principles of durability and resource efficiency. They advocate for transparency in material sourcing and manufacturing, promoting authenticity, which resonates with key sustainable design frameworks that prioritize reducing environmental impact and fostering meaningful connections between users and products (Zhang, 2022). Together, these findings emphasize how traditional making practices, when integrated with contemporary design, can enhance sustainable living in meaningful and holistic ways.

These insights demonstrate how traditional crafts can create not only enduring products but also foster resilience and interconnectedness within communities and ecosystems. The designers' work illustrates the transformative potential of traditional crafts, contributing to

sustainability in both tangible and intangible ways, reflecting the dual role that design can play in both environmental and social sustainability (Zhan and Walker, 2017).

However, while the designers share an optimistic vision for the role of traditional crafts in contemporary design, it is important to acknowledge the challenges they face in translating their ideals into practice. There may be a gap between what designers aim to achieve and the reality of implementing these intentions on the ground. The complexities of working with traditional crafts, such as balancing preservation with market demands, overcoming economic constraints, and addressing issues of scalability, can often make it difficult to follow through on what should ideally be done. Designers noted the struggle of maintaining the authenticity and transparency of materials while meeting the commercial and production pressures that exist in today's competitive market. Furthermore, the integration of traditional techniques into modern design systems may be hampered by logistical and cultural barriers that limit the effectiveness of these practices in achieving widespread, sustainable impact. This challenge reflects broader concerns raised in the literature about the difficulty of reconciling craftsmanship with industrialization (Mullagh, Walker and Evans, 2019) and scaling artisanal products for larger markets (2022). Therefore, while the designers' enthusiasm for preserving traditional craft practices and advocating for sustainability is commendable, the real-world challenges they face need to be recognized to understand the full complexity of their contributions to sustainable design.

Chapter 6 Discussion of Findings

6 Discussion of Findings

6.1 Introduction

This chapter addresses RO 6: To develop a comprehensive framework for designing holistic and meaningful products, based on insights from objectives 3, 4 and 5.

This chapter will synthesise, interpret and critically analyse the data generated from the case studies (Chapter 4), and the interviews (Chapter 5). The data from these two sources will be considered in the context of the literature review, and in particular Walker's (Walker, 2011b) QBL (discussed in section 3.6.1) . As the aim of this thesis is to investigate what contemporary product design could learn from traditional Indian products and practices, this chapter further develops the key themes identified and discussed in chapters 4 and 5.

These themes are:

1. Knowledge transmission: fostering the transfer of techniques, skills, and traditions within communities
2. Local production-to-consumption ecosystem: exploring the interconnectedness of local production-to-consumption systems, emphasizing community engagement, interrelationships and co-creation
3. Nurturing cultural meaning: fostering meaningful cultural values and rituals surrounding products and practices
4. Transparency and material honesty: advocating for transparent and honest practices in material use and manufacturing, promoting local materials, skills and minimalistic approaches
5. Longevity and resource consciousness: emphasizing principles of repair, reuse, reduction, multi-use, longevity and resource sufficiency

Sections 6.2.1 to 6.2.5 begin with a literature section for each theme. These sections draw out and recap the key parts of the literature that are relevant to the respective theme. Introducing the literature in this way helps to contextualize the discussion by linking back to existing research and theoretical frameworks, ensuring that the analysis is grounded in a broader academic context.

Section 6.2.1 emphasizes the transfer of techniques, skills, and traditions in sustainable design. It links back to existing literature in Chapter 2, advocating for the incorporation of traditional knowledge into contemporary frameworks while addressing challenges like cultural appropriation and environmental impacts. Section 6.2.2 highlight the economic benefits and community cohesion derived from traditional crafts, this section examines how local ecosystems integrate such practices amidst global challenges. Exploring the holistic well-being and cultural significance embedded in traditional crafts, section 6.2.3 reviews literature gaps in integrating cultural dimensions into sustainability.

Examining principles of transparency and material honesty, section 6.2.4 underscores the use of local materials and minimalistic approaches in sustainable design. It contrasts historical and modern sustainability movements, showcasing how traditional products embody ethical practices and efficient resource use. Interviews highlight challenges in supply chains and packaging, concluding with design considerations for integrating transparency into contemporary practices.

Section 6.2.5 focusing on principles of longevity and resource sufficiency: this section discusses repair, reuse, and multi-functionality in sustainable design. Case studies demonstrate how traditional products achieve durability and cultural significance through efficient resource use. Interviews with designers emphasize the integration of these practices despite modern consumption patterns, advocating for need-based design and sensory engagement.

The chapter concludes by adapting Walker's QBL framework, which emphasises personal, social, and practical dimensions whilst de-emphasising the economic dimension. The QBL is adapted in this chapter in a manner that intends to offer guidance for designers that is actionable. This adapted QBL framework integrates insights from traditional Indian products and practices that have been derived from the previous chapters thus bridging theoretical principles with actionable design methodologies.

6.2 A framework for Holistic Design for Sustainability

6.2.1 Knowledge transmission: fostering the transfer of techniques, skills, and traditions within communities

6.2.1.1 Literature

The literature exploring sustainability and design approaches reveals a multifaceted perspective on the transmission of techniques, skills, and traditions within communities. It acknowledges historical practices and indigenous knowledge and highlight contributions through approaches like New Zealand's braid model (Scrimgeour and Iremonger, 2004). Post-1990s design practices such as social design and co-design emphasize community involvement, fostering the transfer of local techniques essential for sustainable solutions. Scholars such as Papanek and Schumacher critique industrialization and consumerism, advocating for the preservation of traditional skills which indirectly supports cultural continuity and local knowledge integration (Schumacher, 1973; Papanek, 1985b). Despite this recognition, formal integration of traditional knowledge into mainstream sustainability frameworks remains limited. Global sustainability goals sometimes overshadow local specificity, potentially marginalizing community-specific approaches. Biomimicry and Design for Social Innovation actively engage communities in sustainable practices, promoting the transfer of local knowledge. QBL similarly supports this by emphasizing cultural and spiritual values alongside economic and environmental considerations. However, approaches like Cradle-to-Cradle (C2C), Ecodesign, and Life-Cycle Assessment (LCA) primarily prioritize technical and environmental criteria, often overlooking social and cultural dimensions critical for traditional knowledge transmission.

Emerging approaches like pluriversal design (Escobar, 2018), transition design (Irwin, 2015), regenerative design (Gibbons, 2020), and more-than-human design (Giaccardi and Redström, 2020) offer inclusive perspectives, emphasizing interconnectedness, regeneration, and diverse knowledge systems. However, these approaches are criticized for being overly abstract and lacking practical, actionable frameworks. Without clear methodologies, their potential impact on real-world design is limited (Robson, 2011). This gap highlights the need for a practical framework that bridges theoretical concepts with local, community-specific needs, ensuring the integration of traditional knowledge into sustainable design practices.

The literature around traditional knowledge highlights their enduring transmission of techniques, skills, and cultural practices within communities, underscoring their resilience and adaptability across generations (Shils, 1981b; Green, 1997; Berkes, Colding and Folke, 2000). These practices are pivotal for cultural preservation, fostering community cohesion, and maintaining collective memory. Traditional knowledge systems are further valued for their sustainable practices and ethical frameworks, promoting ecological stewardship and respect for nature (Berkes, Colding and Folke, 2000; Nakashima and Rou', 2002). However, these systems face challenges such as marginalization within dominant Western paradigms, threats of commercial exploitation, and the erosion of knowledge over time (Berkes, Colding and Folke,

2000; Mazzocchi, 2006). Addressing these issues requires recognizing and supporting traditional knowledge systems while navigating their complexities in modern contexts.

Similarly, the literature on traditional craftsmanship emphasises its critical role in preserving traditional knowledge and promoting sustainable practices through the transmission of skills and knowledge within communities. Literature also emphasise challenges posed by globalization, environmental pressures, and socio-economic changes that endanger these traditions. Institutional and policy efforts, including legal protections and design interventions, are recognized for supporting artisans and revitalizing traditional crafts.

The analysis of the case studies and interviews in section 6.2.1.1 and 6.2.1.2 builds upon the literature review by providing a nuanced perspective on traditional knowledge transmission, cultural identity, and sustainable practices within Indian traditional communities.

It reaffirms the importance of intergenerational knowledge transfer through oral traditions, apprenticeships, and communal activities, echoing existing studies that highlight these methods as vital for preserving cultural identity and heritage (Gadgil, Berkes and Folke, 1993; Nakashima and Rou', 2002). The emphasis on place-based practices, utilizing locally sourced materials and traditional techniques adapted to regional contexts, aligns with prevailing perspectives on sustainable design, stressing ecological harmony and cultural authenticity in product development (Ehrenfeld, 2008; Walker, 2014c; Manzini, 2019; Walker, Evans and Mullagh, 2019c).

However, the analysis also introduces novel perspectives, particularly emphasizing the significant role of design education in transmitting traditional knowledge, making skills and integrating them into modern design practices. This nuanced approach complements existing literature focused on community-based preservation efforts (Aruljothi and Ramaswamy, 2014; Choudhary and Mishra, 2022). Additionally, the emphasis on holistic sustainability—encompassing environmental, cultural, spiritual and economic dimensions—and the utilization of social media for contemporary outreach represent strategies not extensively covered in literature. These insights broaden the discourse on learning from traditional and place-based knowledge, illustrating evolving methods to ensure their relevance and sustainability in a dynamic global context. Ultimately, the transmission of these knowledge systems guides us towards designing more meaningful and holistically sustainable ways of living, integrating local wisdom with contemporary needs and challenges.

6.2.1.2 Case studies

The traditional products explored as case studies (see Chapter 4) represent more than just functional objects; they are embodiments of cultural identity, place-based consumption, and craftsmanship in India. Through the transmission of skills, place-based practices, and hands-on craftsmanship, these products continue to thrive as cherished symbols of local culture and community resilience.

Across all case studies, there is a consistent pattern of intergenerational knowledge transfer. Makers of these products pass down their skills, techniques, and cultural traditions to younger generations within their communities.

Each of these traditional products carries a strong cultural and symbolic identity, representing traditional local practices and reflecting the values, customs, and heritage of the regions where they are practiced. Whether it's the eco-friendly *Matka* for storing water, the *Charpai* as a quintessential piece of Indian furniture, the auspicious *Lakshmi Jhadu* symbolizing purity, the vibrant *Chindi* rug showcasing regional aesthetics, or the sustainable *Patravali* reflecting local customs, these products showcase regional variation influenced by factors such as available materials, climate, and historical traditions.

The production of these traditional products is deeply rooted in the local environment and resources, reflecting a place-based approach to making and consuming. Makers utilize locally available materials and traditional techniques adapted to suit the specific conditions and cultural practices of their region, ensuring ecological harmony. Whether sourcing clay for *Matkas*, wood for *Charpais*, natural fibres for brooms, fabric scraps for *Chindi* rugs, or leaves for *Patravali*, the connection to the local landscape and network enhances the authenticity and resilience of these products by eliminating the dependencies on external resources and supply chains.

The production and use of these traditional products foster connections between makers, communities, and users. Makers often sell their products locally, establishing direct relationships with buyers and contributing to the local economy. The manual effort involved in using these products enhances their value and significance in user's lives. The products serve as cultural symbols, connecting people to their heritage and traditions. Moreover, these products are predominantly handmade, emphasizing the value of artisanal craftsmanship and the human touch in the production process. Each product bears the marks of the artisan's skill and creativity, distinguishing it from mass-produced alternatives and reinforcing the importance of handmaking in preserving cultural knowledge and resource efficient and environmentally just consumption.

6.2.1.3 Interviews

Designers' approach to design embodies a holistic understanding of knowledge transmission, identity, place, and connection in the context of craft practices. Through their work, they demonstrate the transformative potential of design in preserving and revitalizing traditional crafts while also celebrating the rich diversity of regional identities and cultural heritage.

Most of the designers' journeys underscore the importance of preserving and transmitting traditional craft skills, techniques, and traditions. Through their experiences in visiting remote villages and engaging with local artisans, they recognise the value of these practices. They acknowledge the challenges faced by artisans in sustaining their crafts amidst changing socio-economic landscapes, such as the decline of certain crafts due to factors like mass-production, decline in sales of their products and other economic opportunities. However, designers also emphasize the need for designers to play a role in revitalizing these practices by adapting them to contemporary contexts. For example, P1 mentions the importance of crafts in perpetuating knowledge systems to be carried forward, highlighting how each artefact represents a living repository of historical and cultural knowledge. This aligns with the idea that crafts are not just products but embodiments of intergenerational learnings, skill and cultural transfer. However, designers highlight the lack of documentation and recognition for traditional craft practices, particularly in the Global South. Most of them note that many traditional ecological knowledge systems are undocumented and underappreciated, leading to their marginalization in academic discourse and policymaking.

Additionally, nearly all designers also play a role in transmitting craft knowledge by offering workshops, apprenticeships, and educational programs aimed at both artisans and the wider community. According to them, for artisans, these workshops serve as platforms for learning and refining their skills, staying updated with new techniques, and understanding market trends. For the general public, workshops (in person and utilising social media) spread awareness and appreciation for the craftsmanship involved in these traditional practices. It fosters a deeper connection between the consumer and the artisan, making the process of handmaking more visible and valued. These workshops also offer an opportunity for people to engage with the crafts hands-on, which serves as a powerful way to understand and respect the skill and effort involved. Ultimately, it helps them in building a market that is not just buying a product, but also buying into the story and heritage behind it.

The designers' journeys into working with traditional crafts was significantly influenced by their design education, which played a pivotal role in shaping their perspective and career trajectory.

Their design education provided a foundation through modules focused on traditional crafts and the lifestyles of artisans, and they gained a deep understanding of the cultural significance and craftsmanship behind these practices. This exposure within their formal design education helped them recognize the importance of preserving traditional crafts and integrating them into contemporary design practices. By bridging the gap between modern design principles and traditional craftsmanship, they sought to create a symbiotic relationship that honoured the legacy of artisans while adapting to contemporary needs and trends. Furthermore, the inclusion of traditional crafts in their design education exemplified knowledge transmission within the field of design. It demonstrated a holistic approach to design education, where students not only learn technical skills but also gain an understanding of the broader cultural, social, and environmental contexts in which design operates. By exposing students to traditional crafts and ways of living, design education becomes a platform for transmitting not just skills and techniques but also context, values, worldviews and various ways of living.

Most of the designers' exploration of craft practices in different regions underscores the close connection between craft and regional identity. They recognize the unique cultural and artistic heritage embedded in these practices, which contribute to the distinct identity of each region. Designers' emphasis on using local materials and drawing inspiration from regional traditions reflects a commitment to celebrating and preserving cultural diversity through design. This highlights the role of crafts in shaping and expressing regional identities, as well as the importance of recognizing and honouring these identities in contemporary design practices.

Most of the designers' approach to design is deeply rooted in a sense of place, where they draw inspiration from the local environment, materials, and traditions of the regions they explore. Designers' emphasis on collaborating with artisans who use local materials reflects a place-based approach to design, where the unique characteristics of each region inform the design process. This approach promotes cultural authenticity and meaningful engagement with local communities.

Designers delve into regional craft practices, recognizing the tight link between these crafts and the distinct identities of each region. Their focus on utilizing local materials and drawing inspiration from regional traditions reflects a commitment to celebrating cultural diversity through design. This highlights the crucial role crafts play in shaping and expressing regional identities, underlining the importance of acknowledging and honouring them in contemporary design practices.

Furthermore, designers demonstrate a deep connection to place in their approach. They draw inspiration from the local environment, materials, and traditions of the regions they explore. This emphasis on collaborating with artisans who utilize local materials reflects a place-based design philosophy. This approach ensures cultural authenticity and fosters meaningful engagement with local communities.

Designers mentioned their commitment to fostering connections between people, materials, and traditions. They emphasize the importance of understanding the stories and cultural significance behind craft practices, as well as the role of designers in bridging the gap between tradition and innovation. Designers' focus on handmaking and artisanal craftsmanship reflects a deeper appreciation for the human connection inherent in handmade objects. By prioritizing craftsmanship and personal engagement with materials, designers seek to create products that resonate with users on a deeper level, fostering a sense of connection and appreciation for the cultural heritage embodied in each piece. They also mentioned their consumers buy crafts products as they recognise the value of handicrafts.

6.2.1.4 Implications for contemporary product design

Both case studies and interviews emphasize the transmission of knowledge, regional identity, local production, and handmaking as core aspects of these traditional practices. However, the case studies present a more idealized view, focusing on the cultural significance and environmental benefits without delving into the challenges faced by artisans today. In contrast, the interviews highlight these challenges—declining sales, competition from mass production—and underscore the proactive role designers play in preserving, documenting, and adapting traditional crafts for contemporary contexts. According to the case studies, traditional practices inherently prioritize cultural identity, regional heritage, and ecological harmony through local materials and techniques. The interviews reveal that contemporary designers see an opportunity to revitalize these practices and celebrate their rich diversity. Both case studies and interviews highlight the value of human connection fostered by handcrafting and the cultural narratives woven into these objects. However, tensions emerge in striking a balance between preserving tradition and adapting to contemporary markets. Designers have the potential to bridge this gap by documenting these practices, ensuring fair recognition for artisans, and potentially expanding their reach. The case studies showcase the beauty of traditional methods, while the interviews highlight the need for documentation and contemporary relevance of these crafts in a world saturated with mass-produced alternatives.

Insights from these case studies and interview analysis suggest that contemporary sustainable design can move towards a more holistic approach. This entails valuing local resources, celebrating cultural heritage, and fostering connections between makers, users, and communities. Ultimately, this can lead to the creation of meaningful products that resonate with consumers on a deeper level, promoting a more mindful approach to consumption. However, there are challenges for contemporary product design seeking to leverage traditional knowledge in sustainable design initiatives.

While regional variation contributes to the richness of craft traditions, designers mention there is a risk of cultural appropriation or misrepresentation when designers borrow elements from diverse cultural backgrounds without proper understanding or respect for their origins. This can perpetuate stereotypes and erode the integrity of indigenous craft practices, leading to exploitation and marginalization of the communities involved. Furthermore, the growing demand for local materials can contribute to environmental degradation and exploitation of natural resources, contrary to the principles of sustainability. While handmaking is often romanticized for its authenticity and human touch, it can also be labour-intensive and economically unsustainable in today's fast-paced consumer culture. The time and effort required for handmade production may not always be feasible or cost-effective.

However, insights from the literature combined with the analysis from the case studies and interviews suggest that these challenges can be addressed with more holistic and inclusive approaches to design. For example, designers can prioritize deepening their understanding of diverse cultural backgrounds and traditions before integrating elements into their designs. This could involve engaging with local communities, respecting their knowledge, and acknowledging their contributions. By involving stakeholders throughout the design process, designers can co-design solutions that honour cultural heritage and incorporate local knowledge in a meaningful and respectful way.

Furthermore, emerging perspectives such as pluriversal design, regenerative design, and decolonial design offer valuable approaches that challenge traditional design paradigms and advocate for more inclusive, ethical, and culturally sensitive practices. These perspectives emphasize the interconnectedness of cultural, environmental, and social systems, calling for design practices that respect cultural diversity and promote sustainability across multiple dimensions (Mitchell *et al.*, 2014; Escobar, 2018). While not rigid frameworks, these schools of thought provide essential perspectives and provoke radical rethinking of design practices. However, there remains a need for practical frameworks that designers can implement in real-

world contexts. A framework grounded in these perspectives will enable designers to navigate complex challenges, respect cultural diversity, and integrate sustainable practices in a manner that is both effective and ethically sound.

By adapting these perspectives and employing a practical framework, designers can help bridge the gap between tradition and contemporary design needs, ensuring that cultural diversity is respected and that sustainable practices are both practical and equitable. This will ultimately lead to the creation of products that not only reflect the heritage of communities but also meet modern consumer demands in a socially and environmentally responsible way.

Based on the analysis from case studies and interviews, the following key design considerations have emerged. These considerations contribute to actionable guidance for contemporary design, feeding into the subcategories of the adapted QBL framework (see section 6.2).

Design considerations:

- **Documentation and research:** document traditional knowledge and conduct research to understand traditional skills, techniques, and cultural significance and its practical application in contemporary design.
- **Collaboration between designers and artisans:** close collaboration between designers and artisans to foster mutual learning and knowledge exchange and adapt it to contemporary contexts.
- **Workshops and education:** integrate traditional practices into design education and workshops for both artisans and the public effectively using social media technologies.
- **Local materials and traditional techniques:** utilize local materials and traditional techniques which are less resource intensive to create need-based design solutions.
- **Cultural connection:** design products that resonate with regional identities and cultural narratives.
- **Community involvement:** work collaboratively with local communities and consumers to understand their needs and their involvement will foster their connection with holistic and mindful ways of production and consumption.
- **Place-based design:** consider the local environment and resources when designing.
- **Pluriversal and decolonial practices:** move beyond western design perspectives and embrace diverse knowledge systems.

6.2.2 Local production-to-consumption ecosystem: emphasizing community engagement, interrelationships and co-creation

6.2.2.1 Literature

The literature on sustainability and design emphasizes the pivotal role of local production-to-consumption ecosystems, highlighting their utilization of local resources and community creativity within frameworks such as Design for Social Innovation and Product-Service System Innovation. These approaches are designed to foster sustainable solutions and supporting community resilience. Historical movements like the Arts and Crafts Movement exemplify how localized design practices have historically supported sustainability efforts by integrating craftsmanship with environmental stewardship.

Despite these benefits, mainstream sustainability frameworks often prioritize global technocratic solutions and economic growth paradigms, potentially marginalizing local production-to-consumption systems. This bias can impede their integration into broader sustainability strategies, despite their potential to enhance resilience, safeguard cultural diversity, and minimize environmental impacts.

Emerging approaches like pluriversal design, transition design, regenerative design, more-than-human design, and decolonial design push for a more inclusive and holistic view of sustainability. These perspectives seek to decentre Western norms and recognize the interconnectedness of human and ecological systems, advocating for designs that are context-specific, culturally sensitive, and ethically grounded. However, despite their potential to provoke radical rethinking, these approaches often face criticism for being conceptual and lacking in practical frameworks that can guide designers in real-world applications.

Moreover, the literature on traditional knowledge underscores the multifaceted importance of traditional knowledge within local ecosystems, highlighting how these practices integrate sustainable resource management with cultural and social values. These systems not only promote social cohesion but also demonstrate adaptability to local environmental conditions, offering holistic models for sustainable living and showcasing resilience in the face of environmental challenges. However, traditional practices often face challenges within global sustainability frameworks, including ethical concerns over misappropriation and a lack of recognition within Western scientific paradigms. Bridging these gaps requires addressing integration challenges and fostering mutual respect between traditional knowledge and modern sustainability approaches.

The analysis in sections 6.2.2.2 and 6.2.2.3 closely aligns with the literature, emphasizing community engagement, interconnectedness, and co-creation, while offering additional practical insights to balance learnings from traditional knowledge and its application in contemporary design context. Analysis highlights the integration of production processes with local environmental conditions and cultural practices to design meaningful and holistically sustainable products and the use of regional materials and traditional techniques to foster self-sustaining local economies.

However, the interview analysis also reveals practical challenges such as maintaining quality, financial instability, and logistical barriers of non-localised production-to-consumption ecosystems. These challenges illustrate the complexity of sustaining traditional crafts amid economic pressures, providing a nuanced view beyond the theoretical frameworks. Additionally, analysis highlight issues around scalability, indicating that while these ecosystems are effective locally, they are difficult to apply on a broader scale. However, both case study and interviews stress the importance of integrating local context and cultural elements into design processes to design holistic products and findings offer practical strategies and considerations. This practical perspective complements and enriches the theoretical frameworks provided in the literature, offering a more comprehensive view of integrating traditional and local knowledge into holistic sustainable strategies to foster resilience and sufficient ways of living.

6.2.2.2 Case studies

In each case, there is a strong emphasis on local production using regionally available materials and traditional techniques. For example, *Matkas* are made from locally sourced clay, *Charpais* from indigenous wood, and *Chindi* rugs from fabric scraps collected within the community. This localized production contributes to a self-sustaining ecosystem where resources are utilized efficiently, and the economic benefits of production remain within the community.

The production and consumption of these traditional products are intricately woven into the fabric of local communities, forming a holistic ecosystem of interconnected trades and activities. By sharing skills and knowledge, local production to consumption systems revolve around creating meaningful products that reflect the collective identity and values of the community. This ecosystem often involves multiple communities contributing their specialized skills at different stages of the production process. For example, to make the *charpai*, a woodcutter sources local wood, then the carpenter buys it to make the *charpai* frame. After the frame is prepared, it is handed over to the weaver, who purchases ropes crafted from natural

materials from a thread spinner. Using these ropes, the weaver creates a distinctive woven surface. Finally, the bed is sold directly to a local consumer, eliminating the need for specialized packaging or marketing. Additionally, a local cart puller is employed to transport the bed to its destination. Along with the local wood or ropes, the form, shape, size, and aesthetic ornamentation, as well as the weaving patterns, varies regions to region. This demonstrates the value of local economy, community support, collective process and a closed loop of a simple production to consumption system. This division of labour not only creates employment opportunities but also serves as a means of livelihood for various segments of the local population. Each community's expertise and contribution are essential in the collaborative effort to create these traditional products, fostering a sense of cohesion and mutual support within the community.

There are intricate interrelationships between various actors within the production-to-consumption ecosystem. Artisans rely on each other for specialized skills or materials, fostering a sense of mutual support and cooperation.

The production and consumption of these traditional crafts are characterized by co-creation, where artisans and consumers collaborate in the design, production, and distribution of goods. Artisans often customize products based on consumer preferences or feedback, creating a sense of shared ownership and value among community members.

They are closely connected not only in terms of making and consuming but also in terms of after services such as repair, reuse, disposal etc. Certain services revolve around these closed-loop ecosystems within villages eliminating the need for external resources. This system fosters interdependence, self-sufficiency and social cohesion and trust amongst villagers.

Overall, the case studies illustrate how local production-to-consumption ecosystems operate as interconnected networks of artisans, makers, various traders and consumers. Through community engagement, interrelationships, and co-creation, these ecosystems support sustainable livelihoods, cultural preservation, and economic resilience within local communities.

6.2.2.3 Interviews

In the interviews, designers discussed how traditional crafts contribute significantly to the local production-to-consumption ecosystem, fostering resilient and self-sufficient consumption. By utilizing local resources and skills, the crafts help keep economic value within the community, reducing dependency on external markets. The interconnectedness of local production-to-consumption systems was highlighted as crucial for sustaining traditional crafts. The designers

noted that when consumers understand and value the origins and processes behind the crafts, it creates a more robust and supportive market for these products. This interconnectedness encourages a deeper appreciation and engagement with the craft, ensuring its continued relevance and vitality. However, designers also mentioned several challenges within this ecosystem.

One significant issue is the difficulty in maintaining consistent quality and supply, which can be problematic when scaling up production to meet higher demand. Another challenge is the financial instability faced by artisans, who may struggle with fluctuating incomes and lack of access to markets. Designers highlighted that building robust networks between artisans and consumers is crucial, yet it is often hindered by logistical barriers and a lack of infrastructure.

The designers discussed the complex interrelationships between people and trade, highlighting that traditional crafts often involve networks of artisans, suppliers, and local markets. These relationships are crucial for the survival of traditional crafts, as they rely on mutual support and collaboration. Most of them believe that local production helps in preserving traditional crafts and techniques while reducing the environmental impact associated with mass production and long-distance transportation.

They emphasized the value of co-creation, where artisans and designers collaborate to blend traditional techniques with contemporary designs, thereby preserving the craft while making it relevant to modern markets. Nonetheless, this process can sometimes lead to tensions, as balancing innovation with tradition may result in compromises that do not fully satisfy either artisans or designers. Designers actively engage with local communities in the production and consumption process. They involve community members in decision-making, seek their input and feedback, and create opportunities for skill-sharing and empowerment.

Designers also reflected on the increasing focus on adapting crafts to meet modern market demands, including the need for artisans to understand technical specifications, scalability, and market trends. While these adaptations are practical, they often overlook the deeper cultural and spiritual values embedded in traditional crafts. This disconnect risks reducing crafts to commodities rather than holistic practices tied to sustainable and meaningful living. The findings highlight the need to realign market systems to prioritize these intrinsic values, ensuring that the integration of traditional crafts into contemporary design supports both cultural integrity and holistic sustainability.

Designers also discussed the challenges of transporting and packaging handcrafted products, emphasizing the need for efficient logistics to ensure safe and timely delivery. They highlighted

the difficulty of handling delicate items and the importance of using sustainable, eco-friendly packaging materials. They noted the financial implications of high shipping costs and expensive packaging, stressing the need to balance these costs while maintaining product quality. To address these challenges, they suggested partnering with specialized logistics companies, innovating environmentally friendly packaging solutions, and optimizing the supply chain. Additionally, designers advocated for local production hubs where artisans can collaborate and share skills, reducing the need for long-distance transportation and strengthening the local economy.

Furthermore, designers also mentioned the importance of integrating local context into the design, involving local traditions and cultural elements to ensure authenticity and respect for the craft's origins. Honouring the place and people from which the craft emerges helps to enhance its cultural, and economic value. They also stated that understanding and incorporating local cultural, environmental, and social contexts enriches the design process and results in products that are not only aesthetically pleasing but also culturally relevant and sustainable. However, they acknowledged that this integration is not always seamless, as external influences and commercialization pressures can dilute the traditional essence of the crafts.

In summary, designers articulated that traditional crafts play a vital role in the local production-to-consumption ecosystem, promoting resilient and self-sufficient communities. The interconnectedness of these systems, community engagement, and the interrelationships of people and trade are essential for sustaining these crafts. Co-creation and integration of local context are key strategies for preserving and evolving the crafts, though they come with challenges that need to be carefully managed.

6.2.2.4 Implications for contemporary design

Both the case studies and interviews highlight the crucial role of traditional making in local production-to-consumption ecosystems, community engagement, and co-creation. They underscore the importance of using regionally available materials and traditional techniques, which contribute to self-sustaining local economies. The case studies exemplify this with the support of specific case studies, such as *Matkas*, *Charpais*, and Chindi rugs, detailing the intricate division of labour and mutual support within communities. In contrast, the interviews offer broader insights from designers, addressing challenges like maintaining quality and supply, financial instability of artisans, and the importance of integrating local context to ensure cultural

authenticity. A significant tension arises from balancing the preservation of traditional crafts with adapting them to contemporary needs, as well as the economic and environmental pressures associated with increased demand. These insights highlight the need for mindful design approaches that respect traditional knowledge while innovating sustainably. For contemporary sustainable design, this means fostering deeper collaborations with local artisans, ensuring fair economic practices, and promoting environmentally conscious production methods. By addressing these challenges and leveraging the strengths of traditional crafts, designers can create products that are not only sustainable but also culturally enriched and economically resilient.

The case studies and interviews both emphasize the importance of the traditional making which contributes to local production-to-consumption ecosystem, highlighting the interconnectedness, community engagement, interrelationships, and co-creation. Both underline the use of regionally available materials and traditional techniques, fostering self-sufficient and resilient communities. Examples of the case studies, like *Matka*, *Charpai*, and *Chindi* rugs illustrate how local materials and collaborative efforts among multiple communities create a self-sustaining ecosystem. Similarly, the interviews discuss how utilizing local resources keeps economic value within the community, emphasizing the crucial role of mutual support and cooperation among artisans, suppliers, and local markets.

Both case study and interviews recognize the importance of community engagement and co-creation, where artisans and consumers collaborate to customize products, fostering a sense of shared ownership and value. The integration of local context is also a common theme, with both case studies and interviews noting the significance of incorporating local traditions and cultural elements to ensure authenticity and respect for the craft's origins.

However, while case studies primarily focus on the successful division of labour and the creation of employment opportunities within the local ecosystem, the interviews highlight the difficulties in maintaining consistent quality and supply, financial instability of artisans, and logistical barriers hindering robust networks between artisans and consumers. These scalability issues arise because traditional production-to-consumption ecosystems are typically optimized for local effectiveness, making broader application challenging. Therefore, advocating for the strengthening of local production-to-consumption ecosystems becomes crucial, as they not only support local employment but also foster context and place-specific products and do not require complex shipping logistics. Additionally, while both case studies and interviews acknowledge the value of co-creation, the interviews delve into the potential tensions between

balancing innovation and tradition, which can lead to compromises that may not fully satisfy either artisans or designers. Furthermore, the integration of local context is seen as a double-edged sword; while it enriches the design process and enhances cultural value, external influences and commercialization pressures can dilute the traditional essence of the crafts.

For contemporary design, these insights imply the need for mindful approaches that respect traditional knowledge while innovating. Designers must foster deeper collaborations with local artisans, ensure fair practices. Collaboration between artisans and consumers can be promoted to allow for customization and infuse a sense of shared ownership. Designers must prioritize local resources and traditional techniques to foster self-reliance and resilience within communities. Integration of local context must be prioritized for authenticity and cultural preservation, enriching both the design and cultural value of products. Addressing logistical challenges, ensuring fair economic practices, and balancing innovation with tradition are essential for sustainable design. Designers can achieve this by promoting skill sharing practices, fostering collaboration, and establishing local production hubs, ultimately creating products that are aesthetically pleasing, culturally rich, environmentally sustainable, and economically beneficial for local communities.

From the case studies and interviews, several design considerations have emerged. They further contribute to specific subcategories of the adapted QBL framework (see section 6.2), offering practical guidance.

Design considerations:

- **Local production-to-consumption ecosystem:** prioritize the use of regionally available materials and traditional techniques, fostering self-sustaining local economies and acknowledge the interconnectedness of local production-to-consumption systems which fosters trust, reliability.
- **Community engagement, interrelationships, and co-creation:** encourage collaboration between designers, traditional makers and consumers to design, produce, customize products, fostering a sense of shared ownership and value, and promoting mutual support and cooperation within communities.
- **Integration of local context:** incorporating local traditions and cultural elements into design ensures authenticity and respect for the place, enriching both the design process and the cultural value of products.

- **Balancing tradition with innovation:** navigate the tension between preserving traditional crafts and adapting them to contemporary needs, finding ways to innovate sustainably while respecting traditional knowledge.
- **Fair economic practices:** ensuring fair economic practices, including fair wages and equitable distribution of profits, is essential for supporting artisans and maintaining the integrity of local production-to-consumption ecosystems.
- **Skill sharing and collaboration:** establishing platforms for skill sharing and collaboration among traditional makers and communities can enhance resilience and innovation within local communities using local skills and resources.
- **Incorporation of consumer preferences and feedback:** prioritize the integration of consumer preferences and feedback into the design process by actively engaging with local communities and consumers to understand their needs, preferences, and cultural values, to create products that resonate more deeply with users.
- **Development of services within closed-loop ecosystems:** focus on developing services that revolve around closed-loop ecosystems within local communities. This entails creating systems that allow for repair, reuse, and disposal of products within the community, eliminating the need for external resources and reducing shipping and packing.

6.2.3 Nurturing culture: fostering meaningful cultural values and rituals surrounding products and practices

6.2.3.1 Literature

The literature on sustainability and design for sustainability explores how cultural values and rituals surrounding products and practices are integrated or overlooked. It acknowledges efforts to incorporate cultural heritage and values, such as recognizing indigenous contributions to sustainable development. Concepts like social design and participatory innovation emphasize involving communities in the design process, aiming to align products with local cultural norms. However, the discussion tends to prioritize environmental and economic dimensions of sustainability over deep integration of cultural values. There is a noted absence of a robust critique on the Western-centric approach to design, which often side-lines cultural and spiritual dimensions in favour of technical or economic feasibility. Approaches such as Biomimicry indirectly acknowledge cultural influences through their focus on mimicking natural systems, while Design for Social Innovation engages with local cultural contexts to foster social change.

Similarly, the QBL integrates personal, social, and practical meanings, emphasizing spiritual and cultural dimensions alongside economic means.

In recent literature, approaches like decolonial design and pluriversal design provoke a rethinking of traditional frameworks by emphasizing the need to consider diverse knowledge systems and worldviews. These approaches challenge the dominant, often Western-centric, narratives and encourage the inclusion of indigenous, local, and marginalized perspectives in the design process. Decolonial design critiques colonial histories and advocates for the recognition of alternative epistemologies and practices. Pluriversal design promotes the idea that multiple, equally valid worldviews can coexist, fostering a broader, more inclusive approach to sustainability and cultural values. While these perspectives are crucial for broadening the scope of design, they also face challenges in providing practical tools for designers to implement these transformative ideas effectively.

The literature on traditional knowledge offers valuable insights into the preservation and adaptation of cultural values and rituals surrounding products and practices. It emphasizes the continuity of traditions across generations, highlighting their holistic nature that integrates practical skills with spiritual and relational aspects in form of rituals. However, there are critiques regarding the appropriation and commodification of traditional knowledge by Western entities, pointing to ethical concerns and the need for fair compensation and respect for indigenous rights. While the literature recognizes the importance of tradition in preserving cultural heritage, there is room for deeper exploration into the intricate meanings of rituals and their contemporary relevance amidst globalization and technological advancements. The exploration of how design interventions intersect with cultural values within the context of traditional crafts in India underscores the pivotal role of design in revitalizing and sustaining traditional craftsmanship while navigating contemporary challenges and opportunities. The literature underscores the significance of preserving indigenous knowledge and skills, fostering meaningful cultural values, and ritualizing practices. However, it also acknowledges existing challenges such as globalization's impact on traditional crafts and the need for inclusive policies and interventions.

The analysis presented resonates strongly with existing knowledge and literature on traditional knowledge, while also offering unique perspectives and insights. It aligns with established understanding by affirming the profound cultural significance and ritualistic roles embedded in traditional crafts. These crafts are portrayed not merely as functional items but as repositories of collective memory and identity, embodying spiritual and symbolic meanings that connect

individuals to their cultural heritage and environment. Additionally, the analysis concurs with existing literature on the contribution of traditional crafts to holistic well-being, emphasizing their role in fostering purpose, belonging, and mindfulness through engagement with cultural practices and rituals. It further aligns by recognizing the symbiotic relationship between traditional crafts and the natural environment, showcasing the use of sustainable materials and adaptive practices that reflect traditional ecological knowledge.

However, the analysis diverges from literature by highlighting specific challenges in integrating cultural, spiritual, and ritualistic dimensions into contemporary design. It underscores the complexities involved in translating traditional meanings and practices into modern contexts, noting risks of cultural appropriation and the practical difficulties faced by designers in effectively embedding these dimensions into products. Nevertheless, the analysis seamlessly incorporates findings from case studies and interviews to offer comprehensive and actionable strategies to incorporate cultural values and ritual into products and practices. By emphasizing research, collaboration, storytelling, and holistic well-being as crucial design considerations, the analysis bridges empirical examples with expert perspectives. This integration proposes practical pathways for contemporary design to responsibly and effectively navigate the complexities of cultural integration.

6.2.3.2 Case studies

The traditional products investigated as case studies are not merely utilitarian items; they are deeply embedded in cultural values and rituals. The spirituality inherent in these objects resonates with the concept of holistic well-being and life-enhancing practices. These objects transcend their physical forms, symbolizing deeper cultural and spiritual realities integral to the communities that create and use them. *Matkas*, used for storing water, represent a connection to the earth, utilizing natural cooling properties that align with holistic well-being practices. *Charpais* embody the simplicity and interconnectedness of daily life, often serving as gathering spaces that enhance social and spiritual connections. The *Lakshmi Jhadu*, associated with the goddess Lakshmi, symbolizes purity and auspiciousness, linking daily cleaning practices with spiritual rituals that foster a sense of sacredness in everyday activities.

Chindi rugs, crafted from recycled fabric scraps, reflect values of sustainability and resourcefulness, symbolically representing the cycle of life and the interconnectedness of all things. *Patravali* plates, made from natural leaves, are used in various rituals and festivities, highlighting the respect for nature and the spiritual significance of food and communal eating.

These objects, deeply embedded in cultural rituals and spirituality, offer intuitive ways of knowing and living that go beyond mere functionality. They foster a sense of meaningful being within the environment, connecting individuals to their cultural heritage and the natural world. This holistic approach to life, where spiritual and practical aspects are seamlessly integrated, exemplifies how traditional objects can symbolically represent and enhance deeper realities and ways of conceptualizing the human–nature relation, that is, how humans and the rest of nature are related.

These products embody what it means to live meaningfully within one's environment. The process of creating and using these items is interwoven with the natural surroundings, fostering a sense of belonging and environmental stewardship. The interconnection with nature is evident in the sustainable materials used, historic significance of materials, objects and their use in everyday life, and how the narratives around nature interwind with products and associated practices. These products are seamlessly intertwined with local music, religions, spiritual practices, folklore, narratives, and food traditions. The interdependence of nature and human activity is fundamental to traditional products. Communities rely on locally sourced natural materials, reinforcing their symbiotic relationship with the environment. This interdependence also extends to social structures, involving various communities and trades in different stages of production, highlighting the interconnectedness of human and ecological systems.

Traditional products are seamlessly integrated into rituals and daily activities, reinforcing this interconnectedness. For example, sweeping the floor first thing in the morning is considered auspicious. Additionally, it is ritualistic to store broom in particular position to maintain its shape and one should not touch it with their feet to disrespect god and the natural fibres. These activities are more than chores; they are meaningful practices that deeply connect individuals to their heritage, spirituality and nature, emphasizing that humans are part of a broader ecology rather than superior to it. Almost every product and associated practices investigated in case study exemplify deep symbolic connection, rituals, spiritual and religious values which are intertwined with respecting nature and living within means. Each product's functionality and significance are enhanced by seasonal changes and adaptation accordingly. For example, *charpais* are often moved outdoors in the summer to take advantage of cooler evening breezes and during winters extra layer of *chindi* rugs are added for the warmth.

These objects often hold sacred significance, playing vital roles in religious ceremonies, prayers, and rituals across diverse cultural landscapes. They are also spiritually relevant in non-religious rituals and ceremonies, such as the fact that every household has different ritual of replacing

the water pot during summer. Through these objects and meaningful practices spirituality involves regular, communal practices that foster deeper understandings and a holistic outlook, maintaining historical significance, promoting self-expression, and fulfilling ceremonial roles that reinforce cultural values and spirituality.

This holistic approach to life is evident in the production and use of these products and practices. As communities maintain control over the satisfaction of their needs, products are made using need-based consumption rather than excess. For example, co-owning, sharing certain products and practices include how communities arrange communal water sharing during summers with co-owned terracotta pots so everyone can have cold water. There is also a social cohesion between households, neighbourhoods, and regions, which are interconnected and which resemble ecosystems in their structure and function, emphasizing the organic unity of human and natural systems.

6.2.3.3 Interviews

Designers emphasized that traditional crafts hold immense cultural significance, serving as repositories of collective memory and identity. These crafts embody centuries-old traditions, reflecting the values, beliefs, and practices of diverse communities. By embedding cultural values and rituals into their designs, they aim to evoke a sense of connection, belonging, and identity among consumers. They mentioned how traditional crafts contribute to holistic well-being by fostering a sense of purpose, belonging, and connection to one's cultural heritage and environment. They also asserted that people who engaged in craft practices through their workshops found it therapeutic, promoting mindfulness and mental health. Designers discussed how crafts are rich in symbolism and spirituality, with each motif, pattern, and technique carrying layers of meaning. Designers spoke of how these symbols encode spiritual beliefs, cosmological concepts, and ancestral wisdom, infusing the objects with sacred significance. Designers emphasized the importance of tacit knowledge and embodied practice in mastering craft techniques and understanding cultural nuances.

Designers discussed that crafts seamlessly integrate spiritual and practical aspects, blurring the boundaries between the sacred and the mundane. Designers noted how everyday objects, such as pottery or textiles, are imbued with spiritual symbolism and used in rituals and ceremonies. Designers highlighted the symbiotic relationship between craft production and environmental cycles, with artisans drawing inspiration from the natural world and adapting their practices to seasonal rhythms and agricultural cycles. They recognised that rituals are woven into the fabric

of daily activities, with craft-making often embedded in ceremonial practices and seasonal rituals. Designers spoke of how these rituals reinforce social cohesion, mark life transitions, and celebrate communal bonds. Designers emphasized the adaptability of craft traditions, which evolve in response to environmental shifts and cultural dynamics. Many craft traditions have sacred significance, with artisans invoking spiritual practices and rituals during the creative process. Designers discussed how these spiritual dimensions infuse crafts with a sense of reverence and transcendence.

While they acknowledged the significance of the cultural, spiritual, and ritualistic dimensions inherent in traditional crafts, there was comparatively less discussion on how they incorporate these aspects into contemporary design. However, they did emphasize the importance of embedding rituals and spirituality in contemporary design as a means of connecting individuals with their cultural heritage and fostering a deeper sense of meaning and connection with the products they use. They highlighted the significance of rituals in daily life and how they can be integrated into contemporary design to enrich the user experience. One approach mentioned was incorporating symbolic elements and motifs inspired by traditional rituals and spiritual practices into the design aesthetics. This could involve using sacred symbols or patterns in product design or incorporating rituals into the user experience, such as through packaging or product usage instructions.

Some of them underscored the importance of workshops for the public as avenues for education, cultural exchange, and community engagement. They emphasized that workshops offer opportunities for people outside the artisan community to learn about traditional crafts, techniques, and cultural practices. Additionally, most of them emphasized the importance of storytelling and narrative in conveying the cultural and spiritual significance of the products, allowing consumers to connect with the deeper meanings behind the designs, and this being one of the reasons their consumers make conscious choice of buying craft products over mass manufactured.

One of them also mentioned not incorporating this enough into their designs and that they are addressing this by engaging in extensive research and collaboration with artisans to gain insights into traditional practices and meanings. This helps them ensure that designs respect and reflect the cultural heritage they draw upon. Furthermore, they prioritize community involvement and co-creation processes, fostering partnerships with local artisans and communities to ensure that designs are rooted in shared values and traditions.

6.2.3.4 Implications for contemporary design

The case studies and interviews both emphasise the cultural significance of traditional crafts, rituals, and practices. Case studies and interviews highlight how these objects are deeply embedded in cultural values, spirituality, and rituals, serving as repositories of collective memory, identity, self-expression, historical significance, and ceremonial. They both underscore the importance of these crafts in fostering holistic well-being, promoting mindfulness, and connecting individuals to their cultural heritage and environment.

The case studies are an in-depth exploration of detailed examples of traditional products and their cultural meanings, illustrating how these objects are seamlessly integrated into daily life and rituals. On the other hand, the interviews offer broader insights from designers, discussing the broader cultural and spiritual dimensions of traditional crafts and their significance in contemporary design. While the case studies delve into the specific cultural contexts and practices associated with each product, the interviews explore the broader themes of spirituality, symbolism, and ritualistic significance across different craft traditions.

While designers acknowledge the importance of embedding rituals and spirituality into their designs, they also acknowledged the difficulties in translating these traditional meanings and practices into modern contexts. However, they did mention that consumers prefer objects with which they resonate deeply. They discuss the symbiotic relationship between craft production and environmental cycles, with rituals intertwined with daily activities, reinforcing social cohesion and marking life transitions. They noted that self-expression in design allows individuals to connect with and showcase their cultural heritage, using products that reflect their personal and collective identities. Historical significance adds depth to contemporary creations, as incorporating traditional elements and stories into modern designs ensures that cultural legacies are preserved and celebrated. Ceremonial use, deeply rooted in cultural values and spirituality, imbues products with a sense of reverence and purpose.

Designers also stressed the importance of understanding and respecting the rituals and spiritual practices that inform these cultural values. They mentioned that this involves more than just aesthetic inspiration; it requires a deep engagement with the cultural contexts and narratives that give these practices their significance. Through storytelling and symbolic design, designers embed these values into contemporary products, creating pieces that resonate on a profound level with their consumers.

However, while both case studies and interviews stress the importance of these elements which makes traditional products more holistic, there is a notable gap in discussions regarding how these aspects are integrated into contemporary design and less focus on practical strategies for

implementation. Integrating these cultural, spiritual, and ritualistic dimensions into contemporary design practices is challenging due to the complexity and sensitivity of these elements. Cultural values and rituals are deeply embedded in historical, social, and religious contexts, making them difficult for designers to accurately represent. There might be a significant risk of cultural appropriation or misrepresentation, especially when designers are not part of the culture they seek to represent.

The dynamic nature of culture, which evolves over time, further complicates the task of creating products that remain relevant and respectful of both tradition and contemporary changes. Commercial constraints often prioritize efficiency, mass production, and profitability, leading to the dilution of cultural elements to fit market demands. This compromises the integrity of the cultural values being embedded. Designers often face knowledge and skill gaps, lacking the deep, tacit knowledge required to integrate cultural and spiritual aspects into their designs. This knowledge is usually held by artisans and community members with generational expertise. The intangible nature of spirituality and rituals, which are often experiential, makes them challenging to translate into tangible product features.

However, these challenges could be navigated and addressed with careful, respectful, and informed approaches. To do so, the following design considerations emerged from the case studies and interviews. These considerations offer actionable guidance and inform specific subcategories of the adapted QBL framework (see section 6.2).

Design considerations:

- **Research and collaboration:** engaging in extensive research and collaboration with local makers and artisans is essential for understanding traditional/local practices and meanings. This ensures that contemporary designs respect and reflect cultural values appropriately.
- **Integration of rituals and spiritual aspects:** integrating rituals, and spiritual aspects to infuse products with deeper meaning and significance. This could involve incorporating symbolic elements, motifs, materials, techniques, skills into product, or user experiences. Various ritualistic practices could be integrated around ceremonies, local festivals, celebrations embodying symbolic connections and adapting to seasonal changes, reflecting the cyclical nature of life and the interconnectedness of all things.
- **Storytelling and narrative:** emphasizing storytelling and narrative can help convey the cultural and spiritual significance of products, enabling consumers to connect with their deeper meanings which fosters historical significance, and self-expression.

- **Community engagement and co-creation:** prioritizing community involvement and co-creation processes ensures that designs are rooted in shared values and traditions. Collaborating with local artisans and communities not only respects cultural values and heritage but also fosters a sense of identity and pride among stakeholders.
- **Holistic well-being:** adopting a holistic approach that considers not only functionality but also the cultural, spiritual, and ritualistic dimensions of products can foster a sense of purpose, belonging, and connection to one's environment. This approach enriches the user experience and fosters a deeper sense of connection and meaning, maintaining historical significance, promoting self-expression, and fulfilling ceremonial roles that reinforce cultural values and spirituality.
- **Developing culture, traditions, and values:** focusing on developing and nurturing culture, traditions, and values through production and making of objects. This can be achieved by engaging with cultural narratives, cultural exchange, exchange of skills, seasonal gatherings, crafting sessions, historical events fostering partnerships and community engagement that ensure designs are rooted in shared values and traditions.

By incorporating these insights into contemporary design practices, designers can create products that resonate with consumers on a deeper level, fostering meaningful connections with local culture and promoting holistic well-being.

6.2.4 Transparency and material honesty: promoting local materials, skills and minimalistic approaches

6.2.4.1 Literature

The literature on sustainability and design offers a detailed exploration of historical movements and modern shifts towards ecological consciousness. It traces the evolution from traditional craftsmanship to post-industrial revolution consumer-led design, highlighting movements like Arts and Crafts and Bauhaus that valued local materials and minimalistic approaches. While acknowledging ecodesign and green design movements from the 1980s onward, which focused on minimizing environmental impacts, the literature lacks explicit discussion on transparency in material sourcing and the promotion of local materials and skills. Furthermore, minimalistic design approaches are underrepresented, with minimal emphasis on strategies for reducing resource use and environmental footprint. Approaches such as Natural Capitalism emphasize efficient resource use without explicitly addressing transparency and honesty in material sourcing. Cradle-to-Cradle promotes closed-loop material flows and safe recyclable materials,

aligning with transparency in manufacturing but less so with material honesty and local materials. Biomimicry draws on nature for sustainable solutions, touching on transparency through natural processes but not on local skills, materials or sufficiency approaches. Similarly, life cycle assessments, potentially enhances manufacturing transparency but lacks focus on local materials. Design for sustainable behaviour targets consumer behaviour change, indirectly impacting minimalistic approach but does not address transparency and honesty materials or manufacturing. QBL supports local skills and cultural values but lacks specific guidance on transparency.

The literature on traditional knowledge illuminates the enduring practices and wisdom that sustain communities through generations, rooted in local materials, skills, and minimalistic approaches. Positively, these practices promote sustainable sourcing, material honesty, and transparency throughout.

The analysis of case studies and interviews on transparency, material honesty, and local, sustainable design practices aligns with literature in some ways but also extends and diverges. It reaffirms established principles such as the importance of transparency and material honesty in sustainable design. Specific examples from case studies illustrate these principles in action, showcasing how local, natural materials and minimalistic design contribute to holistic sustainability. However, the analysis goes beyond historical contexts by offering contemporary insights into design implications and challenges. It addresses current issues such as complex supply chains, logistical difficulties in shipping goods, and the need for sustainable packaging solutions. These practical considerations are underrepresented in literature but are crucial for bridging theory with real-world implementation.

By integrating empirical data from interviews with designers and detailed case studies, the findings from analysis seamlessly incorporates both theoretical frameworks and practical applications. It provides a comprehensive view of how transparency, local skills, and efficient resource use can contribute and enhance sustainable design practices today, enriching understanding with tangible examples and current challenges in the field. This approach enhances the discourse on sustainable design by offering practical design considerations aiming to guide more effective and holistic approaches.

6.2.4.2 Case studies

The traditional products investigated in the case studies exemplify transparency and material honesty by prioritizing local materials, skills, and minimalistic design. These products are made

from locally sourced, natural, and renewable materials, ensuring both transparency in their origin and honesty in their composition. The natural materials used in these products, such as clay in *Matkas*, wood in *Charpais*, and leaves in *Patravali* plates, are unaltered, reflecting material honesty in their pure form. The production processes of these traditional products also embody transparency, relying on local vernacular techniques passed down through generations. These techniques have stood the test of time and are well-known and trusted within the community. Local makers are involved at every stage, from gathering raw materials to final production, ensuring accountability and trust in the process.

Moreover, these traditional products are characterized by their efficient use of resources, minimizing waste. For example, *Chindi* rugs are made from fabric scraps that would otherwise be discarded, and the construction of *Chindi* rugs requires minimal tools or machinery. Similarly, the production of *Patravali* plates involves using just the necessary amount of leaves, with the remainder being fed to cattle. These practices ensure that no materials go to waste and that production is based solely on need. The use of local skills throughout the production process ensures that these traditional objects are of high quality. For instance, the creation of *Charpais* involves a wide range of local skills, such as wood selection, carpentry, toolmaking, and weaving. These practices ensure that traditional knowledge and craftsmanship are passed down through generations, preserving the cultural heritage of the community.

The designs of these products are minimalistic yet functional, focusing on essential needs without unnecessary embellishments. The simple design of the mortar and pestle, for example, serves its purpose effectively without superfluous additions. These products are also adaptable to a range of uses, with *Chindi* rugs functioning in diverse settings and *Patravali* plates being used in various cultural and religious ceremonies.

In summary, the traditional products analysed in these case studies showcase transparency and material honesty through their use of local, natural materials, traditional production techniques, and efficient resource use. These attributes ensure that the products are not only sustainable but also deeply connected to the local context and environment.

6.2.4.3 Interviews

Designers emphasize the importance of transparency and material honesty in their work, advocating for ethical and sustainable approaches to material sourcing and manufacturing processes. They prioritize the use of local, natural materials that are ethically sourced and environmentally friendly. By ensuring that materials have a clear provenance and are free from

harmful chemicals and processes, designers guarantee that their products are safe for consumers and have minimal environmental impact.

One designer highlighted that sourcing materials locally not only reduces the carbon footprint but also supports local economies and craftspeople. Designers noted that consumers are increasingly drawn to products that reflect the transparency and honesty embedded in traditional craftsmanship, which aligns with the ethos of their design practices.

Transparency in manufacturing involves clear and open communication about the processes and practices behind product creation. Designers stress the importance of ethical labour practices, fair wages, and safe working conditions, ensuring that the entire manufacturing process is visible and understandable to consumers. One designer mentioned that consumers appreciate knowing exactly where materials come from and how they are sourced, fostering trust and accountability. Designers also emphasized the efficient use of materials, minimizing waste and focusing on need-based consumption. Techniques like upcycling and recycling, as well as a careful consideration of local materials, align with this ethos. Designers collaborate closely with craftspeople to ensure that local skills are effectively utilized and appreciated, and they stress the importance of preserving and promoting the expertise of local artisans.

Finally, designers highlighted that traditional crafts are often designed to meet every day needs in practical and meaningful ways. The goal is to create products that are not only beautiful but also functional and relevant to daily life. However, designers also acknowledged challenges related to the complex supply chain, shipping, and packaging. Handcrafted products, especially delicate items, require specialized packaging to prevent damage, which can be costly and resource-intensive. Designers suggested the need for ongoing research into sustainable packaging solutions and the development of local production hubs to minimize the need for long-distance transportation.

In summary, designers advocate for transparent and honest practices in material use and manufacturing, promoting local materials and skills while ensuring efficient and sufficient use of resources. These principles are integral to their design philosophy, fostering trust and cultural integrity in their work.

6.2.4.4 Implications for contemporary design

Both case studies and interviews emphasize the importance of transparency, material honesty, and the use of local, natural materials. They highlight the efficient use of resources, local skills, and the cultural significance of these practices. Case studies provide concrete examples of

material use and manufacturing techniques, and the role of local makers in ensuring honesty and accountability. In contrast, interviews discuss broader principles of transparency, ethical labour practices, and designers' approaches, while also addressing challenges related to supply chains, shipping, and packaging.

From the case studies and interviews, several design considerations have emerged. These considerations help to shape actionable guidance for integrating transparency into design processes. They feed into the subcategories of the adapted QBL framework (see section 6.2), providing a detailed approach to implementing honest and ethical material practices in contemporary design.

Design considerations:

- **Transparency and material honesty:** design with transparency and honesty in materials, ensuring that the origin and composition of materials are clear and authentic in the origin throughout the manufacturing process.
- **Transparent manufacturing:** maintain transparency in manufacturing processes, utilizing local vernacular techniques and involving local makers at every stage to ensure accountability and trustworthiness.
- **Local skills for everyday needs:** utilize local skills effectively throughout the production process to navigate everyday needs.
- **Efficient material use:** design for efficient and sufficient use of materials, minimizing waste and optimizing resources to meet needs without excess.
- **Adaptability and multifunctionality:** design products with adaptability and multifunctionality in mind, allowing them to be used in various settings and for different purposes.
- **Local production and consumption:** prioritizing sourcing materials locally and producing goods within the community, the need for long-distance transportation and specialized packaging can be minimized.
- **Ethical practices:** prioritize ethical practices in material use, manufacturing processes, and supply chain management.

6.2.5 Longevity and resource consciousness: emphasizing principles of repair, reuse, reduction, multi-use, longevity and resource sufficiency

6.2.5.1 Literature

The literature lacks explicit discussion on principles such as repair, reuse, reduction, multi-use, longevity, and resource sufficiency. Implicit inclusion of these principles can be observed across various perspectives. Key texts like the Brundtland Report and the Sustainable Development Goals (SDGs) indirectly advocate for resource sufficiency and longevity but do not specifically highlight repair and reuse as primary strategies. Ehrenfeld and Hoffman's concept of 'sustainability-as-flourishing' implies a focus on long-term resource management (Ehrenfeld and Hoffman, 2013). Historical contexts, like pre-industrial craftsmanship highlighted by Walker (1989), underscored repair and reuse due to resource limitations and the high value placed on handcrafted items.

Similarly, movements such as the green design and subsequent ecodesign aimed at minimizing negative ecological impacts, aligning with reduction principles (Brezet and van Hemel, 1997). The adoption of life-cycle thinking promote considerations of product lifespan, encouraging durability. Walker and Giard (2013) describe sustainable design as envisioning ways to lead meaningful lives with reduced energy and material consumption, directly linking to resource efficiency and longevity. Approaches like Natural Capitalism, Cradle-to-Cradle, Ecodesign, Circular Economy, and Product-Service System Innovation directly and indirectly supports efficient resource use, reuse and reduction but prioritises economic and technological factors. However, Emotionally Durable Design extends product lifespan by fostering emotional connections and Design for Sustainable Behaviour influences user habits and promote resource efficiency but require significant adjustments.

Stead's work on the Right-to-Repair (R2R) further emphasizes the need for repair and reuse in the context of electronic and Internet of Things devices (Stead and Coulton, 2022a). Stead argues that current R2R legislation, while a positive step, is insufficient in addressing the broader issues of repairability and access to spare parts for IoT devices, which contributes to the increasing volume of e-waste (Stead and Coulton, 2022b, 2022a). The focus on authorized repair entities and limited product categories in the EU's R2R law underscores the need for more comprehensive strategies that embrace repair, reuse, and resource sufficiency (Stead and Coulton, 2022a, 2022b; Stead, 2023).

The literature on traditional knowledge acknowledges principles of longevity and resource consciousness indirectly, emphasizing practices such as repair, reuse, reduction, multi-use, and resource sufficiency. It highlights historical contexts where traditions inherently valued continuity through repair and reuse due to limited resources (Walker, 1989). While studies like those by Berkes, Colding, and Folke (2000) recognize traditional knowledge's sustainable

practices in agriculture and ecological management, explicit discussions on these principles, especially in modern contexts, remain sparse (Shils, 1981b).

The analysis of case studies and interviews in section 6.1.5.2 and 6.1.5.3, both aligns and diverges with literature by explicitly emphasizing principles like repair, reuse, reduction, and resource sufficiency, which are implicitly discussed in contemporary sustainable design frameworks/approaches. Additionally, the focus on need-based design, multi-functionality, durability, and sensory engagement resonates with concept of Emotional Durable Design and Design for Sustainable Behaviour. However, it diverges by uniquely highlighting the cultural significance of products and the role of manual craftsmanship, aspects often overshadowed in contemporary sustainability frameworks that prioritize technological solutions and economic metrics. Findings from analysis present practical design considerations to integrate principles of repair, reuse, reduction, multiuse and resource sufficiency seamlessly.

6.2.5.2 Case studies

The traditional products examined in the case studies exemplify principles of longevity and resource consciousness through various aspects of their design, use, and cultural significance. These products are designed to meet specific needs, resulting in efficient resource use. For example, *matkas* are designed to store water and cool effectively, minimizing the need for additional containers and refrigerators. Many of these products are made with significant reduction in materials and components. For instance, *charpais* are made with just wood and natural fibre ropes minimizing complexity and maximizing durability making it easy to repair, reuse, upgrade and recycle. For example, webbing is tightened from time to time when it gets saggy and thereafter can be replaced with new webbing. The old webbing material is used for various purposes like drying cloths, tying bags etc. Using these products often involves a sensory experience, enhancing the user's connection to the item. For example, grinding food in mortar and pestle provides a tactile and auditory experience which enhances connection with food on deeper level. Additionally, the manual effort required to use these products fosters a deeper connection with them; sweeping with a *Lakshmi Jhadu*, the physical engagement reinforces the value and significance of cleanliness and these items.

These traditional products have stood the test of time, reflecting a slower pace of change compared to mass-produced alternatives. The emphasis on repair, reuse, and multi-use extends the lifespan of these products. Rather than discarding them at the first sign of wear, users often repair and maintain them, contributing to their longevity. These products are designed with

resource sufficiency in mind, using only what is necessary to fulfil their function. For example, *patravali* plates are made from natural leaves and twigs, which are biodegradable and require very minimal processing. Additionally, many of these items serve multiple purposes, further optimizing resource use.

In summary, the traditional products examined in the case studies embody principles of longevity and resource consciousness through their functional design, mono-material construction, sensory engagement, manual efforts, slower pace of change, and efficient use of resources. These characteristics not only contribute to their sustainability but also deepen their cultural significance and connection to users.

6.2.5.3 Interviews

Designers emphasized that traditional crafts embody principles of repair, reuse, reduction, multi-use, longevity, and resource sufficiency. They highlighted how these principles are integrated into their design practice, aiming to create products that meet needs efficiently while minimizing environmental impact. By focusing on functional products which suffice for everyday needs, designers ensure that resources are used judiciously, reducing waste.

In their design practice, they emphasized a significant reduction in materials and components. They mentioned that this approach not only simplifies the production process but also facilitates prolonging the lifespan of the products and minimizing resource consumption. Moreover, the sensory experience of using handcrafted products is considered integral to design. Manual efforts required to use these products create a tactile connection with the user, enhancing the overall experience and fostering a deeper appreciation for craftsmanship.

Designers emphasized that while traditional crafts prioritize longevity and resource consciousness, offering opportunities for effective repair, reuse, and upcycling, these principles face challenges with modern consumers. As products are shipped and consumed across countries, maintaining them becomes increasingly difficult. By addressing these tensions designers can create products that embody a more resource-conscious and resilient design ecosystem.

6.2.5.4 Implications for contemporary design

From the case studies and interviews, following design implications are drawn:

Design considerations:

- **Need-based design:** prioritizing creating products that directly address specific user needs efficiently, ensuring that the design is purposeful and functional.
- **Repairability and reusability:** incorporating products with features that facilitate easy repair, reuse, upgrade, and recycling, thereby extending their lifespan and reducing waste.
- **Multi-functionality and durability:** focus on designing products that serve multiple purposes and are built to last, promoting resource efficiency and longevity.
- **Sensory engagement:** incorporate sensory experiences into product design to enhance user connection, providing tactile elements that foster a deeper connection.
- **Minimalist approach:** emphasizing significant reduction in materials and components, simplifying the production process while maintaining functionality and durability.
- **Longevity over trends:** adopt a slower pace of change in design, creating products that withstand time and resist obsolescence, promoting resilience.

6.3 Adapted QBL

This section adapts and develops Walker's QBL framework (Walker, 2011b). To re-cap, the QBL introduced by Stuart Walker (Walker, 2011), expands on the Triple Bottom Line (Elkington, 1997) of sustainability by incorporating a fourth dimension: personal meaning. This addition emphasizes that economic factors should serve as a means to achieve broader goals rather than as ends in themselves. The QBL prioritizes Practical Meaning (meeting physical needs while minimizing environmental impact), Social Meaning (emphasizing ethics, compassion, equity, and justice), and Personal Meaning (addressing inner values and spiritual well-being) (Walker, Evans and Mullagh, 2019a). By integrating these dimensions, the QBL aims to foster a more holistic and sustainable approach to design, challenging prevailing linear western paradigms in favour of a more meaningful and integrative worldview.

It was evident from the findings of the literature review that the QBL offers a more holistic and meaningful consideration of sustainability, which is why it was used to analyse the case studies in chapter 4. However, the QBL was also found to be limited in terms of practical guidance for other designers to follow, which is reflected in a lack of examples of how designers may have used the QBL. Instead, it has mostly been used as a lens to analyse and examine craft practices, traditional enterprises etc. (see, Zhan and Walker, 2017; Mullagh, Walker and Evans, 2019; Bin Mohamad, 2021; Zhang, 2022). Therefore, I recognized that a more actionable QBL would help to unravel and simplify the complexities of these products around their social, practical, and

personal meanings. In order to incorporate design implications emerged in above section in practice, it was necessary to map them against broad categories of QBL.

To effectively integrate the design consideration discussed in above sections (See sections 6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.1.5) into practice, it was essential to map these implications against the broad categories of the QBL and subcategories of adapted QBL. Mapping the design considerations against the broad categories and subcategories of the QBL was essential for integrating these principles into practice comprehensively. This alignment ensures that the design strategies address the full spectrum of practical, social, personal and economic dimensions—providing a balanced approach. It also helps identify potential trade-offs and synergies between different aspects, facilitating informed decision-making. This draws inspiration from the work of Mullagh et al. (2019) where they expanded the QBL framework based on themes emerging from their analysis of craft-based enterprises. Their focus was on examining small and micro-enterprises in Cumbria, UK, and the potential for design to contribute to their sustenance and flourishing (Mullagh, Walker and Evans, 2019). Similarly, for this study I have adapted the QBL context-specific approach that considers the diverse and complex nature of traditional products and practices investigated in case studies.

Therefore, the necessity for an adapted version of the QBL with subcategories stems from the need to create a more actionable and practical framework for designers to design holistically sustainable products. The subcategories intend to provide clearer guidance for designers, offering specific criteria and components under each aspect. This approach could enhance clarity in decision-making, supporting designers to integrate cultural, spiritual, ethical considerations, and community impacts more effectively into their projects. By offering a structured and adaptable framework, an adapted QBL with subcategories aims to bridge the gap between theoretical sustainability principles, contemporary approaches to design for sustainability and insights from traditional knowledge and practices and their application in diverse design contexts.

The development of sub-categories for the QBL framework was conducted through a systematic approach that combined literature review with empirical data from autoethnographic case studies and interviews. Initially, the process began with an iterative analysis during the creation of a conference paper focusing on stone mortar and pestle versus contemporary mixer grinders. Elements from traditional Indian mortar and pestle were decoded and coded against design suitability parameters found in literature (see Appendix 4). The preliminary subcategories of QBL framework was refined based on insights gathered from Chapter 4 and Chapter 5 of the

research, which analysed various objects. Sub-categories were developed to accurately capture the nuanced aspects of traditional products and practices, ensuring comprehensive representation across the economic, social, environmental, and personal meaning dimensions of the QBL. The refined sub-categories were further validated through additional literature review, conference presentations, and departmental research discussions. This iterative process ensured that the adapted QBL framework was both theoretically robust and practically applicable.

The design considerations developed in this chapter (section 6.2) have further informed the final subcategories. To incorporate and simplify those, I have categorised and mapped the following design considerations against the principle QBL categories of practical, social and personal meaning as well as economic means, these further feeds in to the development of subcategories of QBL.

Practical meaning:

- Local materials and traditional techniques: utilize local materials and traditional techniques which are less resource-intensive to create need-based design solutions.
- Place-based design: consider the local environment and resources when designing.
- Development of services within closed-loop ecosystems: focus on developing services that revolve around closed-loop ecosystems within local communities.
- Efficient material use: design for efficient and sufficient use of materials, minimizing waste and optimizing resources to meet needs without excess.
- Adaptability and multifunctionality: design products with adaptability and multifunctionality in mind.
- Local production and consumption: prioritize sourcing materials locally and producing goods within the community.
- Need-based design: create products that directly address specific user needs efficiently.
- Repairability and reusability: incorporate features that facilitate easy repair, reuse, upgrade, and recycling.
- Multi-functionality and durability: design products that serve multiple purposes and are built to last.
- Minimalist approach: emphasize significant reduction in materials and components, simplifying the production process while maintaining functionality and durability.
- Longevity over trends: adopt a slower pace of change in design, creating products that withstand time and resist obsolescence.

- Sensory engagement: incorporate sensory experiences into product design to enhance user connection.

Social meaning:

- Collaboration between designers and artisans: foster mutual learning and knowledge exchange.
- Community involvement: work collaboratively with local communities and consumers.
- Pluriversal and decolonial practices: move beyond western design perspectives and embrace diverse knowledge systems.
- Fair economic practices: ensure fair wages and equitable distribution of profits.
- Skill sharing and collaboration: establish platforms for skill sharing and collaboration.
- Incorporation of consumer preferences and feedback: actively engage with local communities and consumers.
- Community engagement, interrelationships, and co-creation: encourage collaboration between designers, traditional makers, and consumers.
- Cultural connection: design products that resonate with regional identities and cultural narratives.
- Ethical practices: prioritize ethical practices in material use, manufacturing processes, and supply chain management.
- Transparency and material honesty: ensure that the origin and composition of materials are clear and authentic.
- Transparent manufacturing: maintain transparency in manufacturing processes.
- Workshops and education: integrate traditional practices into design education and workshops.

Personal meaning:

- Integration of rituals and spiritual aspects: infuse products with deeper meaning and significance.
- Storytelling and narrative: emphasize storytelling and narrative to convey cultural and spiritual significance.
- Holistic well-being: consider cultural, spiritual, and ritualistic dimensions of products.
- Developing culture, traditions, and values: focus on nurturing culture, traditions, and values.
- Research and collaboration: engage in extensive research and collaboration with local makers and artisans.

Economic means:

- Local production-to-consumption ecosystem: prioritize the use of regionally available materials and traditional techniques.
- Balancing tradition with innovation: navigate the tension between preserving traditional crafts and adapting them to contemporary needs.
- Documentation and research: document traditional knowledge and conduct research.
- Integration of local context: incorporate local traditions and cultural elements into design.

These thematic groupings reflect the holistic and multidimensional nature of the adapted QBL framework, encompassing cultural sensitivity, community engagement, ethical practices, sustainable approaches, local production, education, and life-centric design principles. Each theme reinforces the overarching goal of integrating sustainability with cultural richness and community resilience in contemporary design practices.

The following diagram (Figure 40) maps the design considerations within the adapted QBL framework.

<ul style="list-style-type: none"> • Local materials • Place-based design • Development of services within closed-loop ecosystems • Efficient material use • Adaptability and multifunctionality • Local production and consumption • Need-based design • Repairability and reusability • Multi-functionality and durability • Minimalist approach • Longevity over trends • Sensory engagement 	<ul style="list-style-type: none"> • Integration of rituals and spiritual aspects • Storytelling and narrative • Holistic well-being • Developing culture, traditions, and values 	<ul style="list-style-type: none"> • Collaboration between designers and artisans • Community involvement • Pluriversal and decolonial practices • Fair economic practices • Skill sharing and collaboration • Incorporation of consumer preferences and feedback • Community engagement, interrelationships, and co-creation • Cultural connection • Ethical practices • Transparency and material honesty • Transparent manufacturing • Workshops and education 	<ul style="list-style-type: none"> • Local production-to-consumption ecosystem • Balancing tradition with innovation • Documentation and research • Integration of local context
<ul style="list-style-type: none"> ▪ Practical application ▪ Local materials ▪ Manufacturing ▪ Energy usage ▪ Longevity ▪ Maintenance and repair ▪ Disposal 	<ul style="list-style-type: none"> ▪ Self-expression ▪ Historical significance ▪ Spiritual values & beliefs ▪ Rituals ▪ Ceremonial use ▪ Health benefits 	<ul style="list-style-type: none"> ▪ Local culture ▪ Community involvement ▪ Co-creation and co-dissemination 	<ul style="list-style-type: none"> ▪ Local production-to-consumption system ▪ Ethical practice ▪ Livelihood & Job creation
<p>Practical Meaning: utilitarian needs and environmental consideration.</p>	<p>Personal Meaning: inner values, conscience, spirituality.</p>	<p>Social Meaning: community, compassion, equity and justice.</p>	<p>Economic Means: financial viability and ethical income</p>

Figure 40 Visual representation of the design considerations mapped across QBL dimensions

While some design implications suggest preserving, documenting and researching traditional knowledge and incorporating that into design education, I suggest this as part of the adapted

QBL framework. The first step would be preserving that traditional knowledge and creating a library and cultural repository. To create that cultural repository, designers and community can request traditional makers to produce a complete variety of traditional objects in the real scale using their own tools, and the designers and the community document the process. It can lead to a combination of the library of physical products, materials, tools and the documentation on technical skills creating the cultural repository, which will also record the rituals, traditions, history, cultural values, spiritual significance and associated practices of traditional objects. The main aim of the cultural repository is to record traditional knowledge as cultural capital, and to serve as sources or design inputs for the next step: incorporating adapted QBL framework. This can be used as reference points for constructing new meaningful material culture.

The table below (see Table 16) presents an adapted QBL framework, featuring developed subcategories and design considerations. It is intended as a practical tool for designers to translate the complex concepts discussed in the above sections into actionable steps.

Table 16 Adapted QBL framework

<p>Practical Meaning: utilitarian needs and environmental consideration.</p>	Practical application	<ul style="list-style-type: none"> • Is the product really needed? • Can it be a multifunctional product? • Does it consider local environment and resources?
	Local materials	<ul style="list-style-type: none"> • Does it use local, natural, renewable material? • Can it be made in mono-material or dual material? • Does it offer transparency and honesty in materials use? • Does it use materials efficiently reducing the waste?
	Manufacturing	<ul style="list-style-type: none"> • Can materials be used with minimal processing without relying on industrialised tools? • Can it be handmade? • Can it use minimal resources to make? • Can it use vernacular tools to make? • Can it reduce the number of production steps?
	Energy usage	<ul style="list-style-type: none"> • Can it be made using minimal energy? • Can it eliminate use of energy during consumption? • Can it eliminate the need for packaging and shipping?
	Longevity	<ul style="list-style-type: none"> • Can this product last longer and connect user on deeper level? • Can it be upgraded? • Can it be reused? • Can it be recycled?

	Maintenance and repair	<ul style="list-style-type: none"> • Does it offer opportunities for repair? • Can it be made in significantly less components? • Does it require lot of maintenance? • Can maintenance/looking after connect user with product deeply? • Would it create services and practices around repair and reuse?
	Disposal	<ul style="list-style-type: none"> • Can it be naturally decomposed locally? • Can it be disposed of without utilising any additional resources?
Personal Meaning: inner values, conscience, spirituality.	Self-expression	<ul style="list-style-type: none"> • Does it promote opportunities for self-expression? • Does it promote opportunities for identity? • Can it be personalised and customisable?
	Historical significance	<ul style="list-style-type: none"> • Does it have historical significance, maybe in from of materials, form, shape, aesthetic etc? • Does it offer symbolic meaning?
	Spiritual values & beliefs	<ul style="list-style-type: none"> • Does it incorporate spiritual values, maybe in from of materials, form, shape, aesthetic etc? • Can it incorporate storytelling and narratives to share spiritual values?
	Rituals	<ul style="list-style-type: none"> • Does it incorporate ritualistic practices? • Can it help create new rituals? • Can it incorporate ancient or religious rituals? • Does it incorporate ceremonial relevance?
	Ceremonial use	<ul style="list-style-type: none"> • Does it promote ceremonial use? • Can it be part of local festivals and celebrations? • Can it adapt to seasonal changes?
	Health benefits	<ul style="list-style-type: none"> • Does it offer health benefits? • Does it promote holistic well-being?
Social Meaning: community, compassion, equity and justice.	Local culture	<ul style="list-style-type: none"> • Does it help develop local culture? • Does it promote local cultural values? • Does it consider local culture and heritage?
	Community Involvement	<ul style="list-style-type: none"> • Does it involve community in its making? • Does it promote communal practices? • Does it foster a sense shared ownership? • Can it involve consumer preference and feedbacks? • Can it engage community to understand their needs, preferences, and cultural values?

	Co-creation and co-dissemination	<ul style="list-style-type: none"> • Can it be co-created with makers, artisans, designers and community members? • Would it promote co-ownership and sharing of goods and services within community? • Does it promote skill exchange and collaboration among community?
Economic Means: financial viability and ethical income generation.	Local production-to-consumption system	<ul style="list-style-type: none"> • Does it utilise local skills well? • Does it revolve around holistic local production to consumption ecosystem? • Does it revolve around interconnected and interdependent local trades? • Does it promote development of local services of repair, reuse, share etc? • Does it promote close loop ecosystems?
	Ethical practice	<ul style="list-style-type: none"> • Does it involve fair economic practice, fair wages and equitable distribution of profits? • Does it promote equitable and just uses of resources? • Does it utilise traditional knowledge ethically? • Does it promote culturally appropriate practices? • Does it utilise ethical and fair materials use, manufacturing process and supply chains?
	Livelihood & Job creation	<ul style="list-style-type: none"> • Does it offer jobs to local community? • Does it offer livelihood generation to local makers, artisans etc.? • Does it revolve around local economy?
<ul style="list-style-type: none"> • Ensure all the elements of the QBL are fulfilled 		

Adapting the QBL framework allows for the deconstruction and simplification of the complexities inherent in traditional products. This enables their use as comprehensive design inputs, leveraging insights gained from these products across different contexts. By broadening the framework, a more nuanced understanding of the intricate interplay between various dimensions is achieved, offering a roadmap for designing products, practices, and systems in a holistic and comprehensive manner as all factors can be considered simultaneously. This stands in contrast to contemporary approaches, where sustainability is often treated as an add-on to the design brief and where each element is addressed and measured separately to reduce the unsustainability (van Hemel and Cramer, 2002; Ehrenfeld, 2008, 2013; Hankinson and Breytenbach, 2013).

The adapted QBL framework provides a robust and holistic approach to design for sustainability, which was effectively tested and implemented in the Willow Bed project in the UK context (see chapter 7), challenging contemporary linear frameworks. It offers an actionable approach to addressing sustainability issues, despite variations in different dimensions influenced by factors such as geographical location, cultural norms, material availabilities, and priorities. This illustrates how integrating personal meaning alongside other QBL dimensions can lead to more sustainable and resonant design outcomes.

6.4 Summary

This chapter addressed RO 6 by developing a comprehensive framework for holistic and meaningful product design. It synthesizes insights from the integration of traditional knowledge, cultural values, ethical practices, transparency, material honesty, and resource consciousness. By examining case studies, conducting literature reviews, and analysing interviews, the chapter provides actionable strategies for designers to create products that are culturally resonant, economically viable, and environmentally sustainable. The framework bridges theoretical principles with practical applications, guiding designers towards informed decisions that prioritize cultural authenticity and sustainability in diverse contexts.

Chapter 7 The Willow Bed

7 The Willow Bed

This chapter addresses the research objective 7: To design a contemporary everyday product that incorporates insights from traditional Indian products and practices and determine how the product accords with sustainability principles.

This chapter presents a practice-based exploration utilizing a research-through-design approach to incorporate learnings and design considerations from traditional Indian products and practices discussed in Chapter 6. By employing an adapted QBL framework, I designed the willow bed for Lancaster. The *charpai* bed, served as an inspiration, guiding the creation of a multifunctional bed that also functions as a sofa, day bed and dining table. This approach justifies the use of research-through-design as it enables iterative exploration and practical application of design considerations, blending theoretical insights with hands-on experimentation (Douglas, Scopa and Gray, 2000; Cross, 2001; Gaver, 2012).

Section 7.1 explores the practical application of an adapted QBL framework through a practice-based inquiry, focusing on integrating design considerations from Chapter 6 into a contemporary UK context. The design takes inspiration from the traditional *charpai* bed to create the Willow Bed and presents the design process.

Focusing on the bed frame, subsection 7.1.1 discusses the use of willow wood, a material with rich historical and cultural roots in the UK. It covers the history, properties, and uses of willow, along with its symbolic meanings and practical weaving techniques.

Subsection 7.1.2 addresses the bed surface design, using Herdwick wool and local knitting traditions. It includes the history, properties, and uses of Herdwick wool, its symbolic meanings, and practical wool processing steps. It also explores using recycled materials in the design and suggests ways to develop community engagement through workshops, seasonal gatherings, and collaborative crafting sessions. It emphasizes creating meaningful experiences and fostering cultural identity around the willow bed and related products.

7.1.3 presents the willow bed through the lens of the adapted QBL framework.

Section 7.2 reflects on the entire design process, discussing how traditional knowledge and holistic thinking contributed to creating a functional and meaningful product. 7.2.1 explores the transmission and preservation of traditional techniques and skills, emphasizing the importance of cultural traditions in modern design. 7.2.2 highlights the significance of community engagement and collaboration within the local production-to-consumption ecosystem,

fostering sustainable practices. 7.2.3 discusses how the design process prioritized the development of meaningful culture, values, and rituals, enhancing the product's cultural identity and community connection. 7.2.4 examines the commitment to transparency and honesty in material use and manufacturing processes, promoting ethical consumption and sustainability. 7.2.5 explores the design philosophy that emphasizes repair, reuse, reduction, multiuse, and longevity, encouraging sustainable consumption habits and minimizing waste.

Finally, section 7.3 Encourages a radical rethinking of contemporary lifestyles, challenging consumerist attitudes, and advocating for designs that prioritize meaning, connection, and holistic well-being over material accumulation.

7.1 Considering traditional knowledge in the UK

In this section I explore practice-based inquiry to demonstrate how the adapted QBL can be implemented. This practiced-based component of the research takes inspiration from the *charpai* case study.

To recap, *charpai* is a traditional Indian bed with a rectangular wooden frame and woven surface, supported by four legs. It is lightweight, portable, and made from natural materials like wood and ropes. The simple, functional design is valued for its durability, portability, and breathability, making it well-suited for hot and cold climates. *Charpais* also play a significant role in social and cultural practices, reflecting traditional craftsmanship and local customs.

The decision to begin with the *charpai* as a design reference, rather than focusing on a traditional Lancastrian form, was driven by its multifunctionality and the sustainable values it embodies, values that are equally relevant to contemporary design in the UK. This allowed for a deeper exploration of the potential challenges and opportunities associated with adapting traditional products and practices to new cultural and environmental contexts.

Based on the findings from the literature, case studies and interviews, I chose to design a bed for the Northwest UK. The designing process served as a vehicle for exploring the opportunities and challenges associated with adapting and applying the knowledge gained from traditional Indian products and practices to a non-Indian context.

The willow bed project aims to show how design can adapt and integrate insights from traditional knowledge, offering practical benefits while supporting local industries and promoting sustainability. The willow bed also emphasizes respectful and meaningful integration

of traditional knowledge to prevent cultural appropriation and misuse, ensuring the adaptation process honours the cultural values of a place.

I began by sketching the *charpai* (see Figure.41) and detailing its features, such as the weaving pattern, and tenon and mortise joints. Reflecting on the case studies, I noted the various components of the *charpai*, including its construction techniques, local materials, forms, visual cues, functionality, rituals, cultural significance, history, and identity representation. I also considered its values, meanings, social norms, and beliefs, along with its role in the local production-to-consumption system, emphasizing co-creation and dissemination, durability, and upgradability.

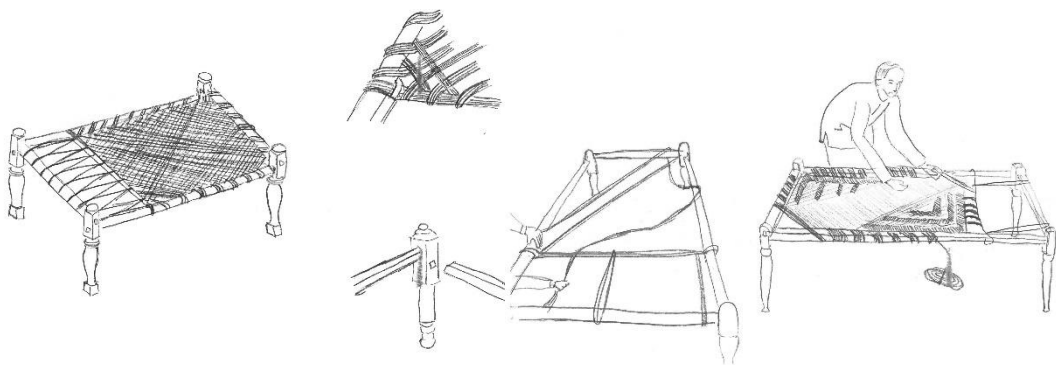


Figure 41 Sketches of charpai and its components

Next, I explored redesigning a bed or seating inspired by the *charpai*, incorporating similar forms, shapes, and materials. My aim was to create a holistic product suitable for use in the North West region of the UK to evaluate the viability of the process and to identify challenges and opportunities. Drawing on my interest in local crafts and my experience living in Lancaster, I identified relevant local materials, skills, and crafts, mapping their connections to the elements identified in the *charpai*.

Recognizing that the *charpai* represents a radical departure from modern sleeping arrangements in the UK, I developed a multifunctional design inspired by the *charpai's* form. I created a foldable bed that can serve as a sofa during the day, a dining table at meal times and a bed for sleeping during nights. Developing a product with multifunctional capabilities was important as multifunctionality was identified in the case studies as being especially significant for developing more sustainable ways of living.

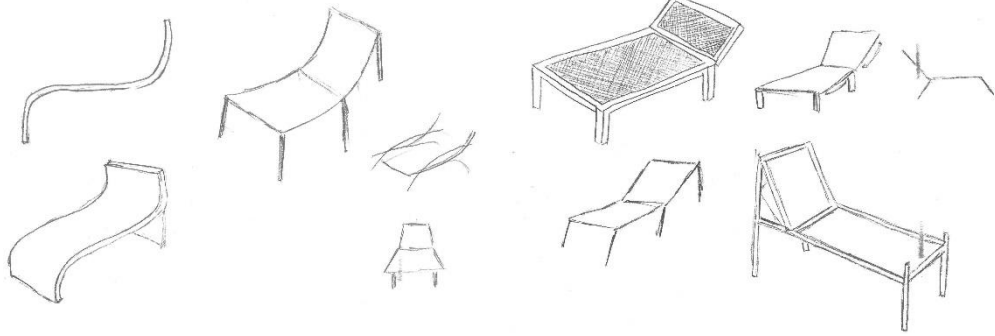


Figure 42 Concept sketches

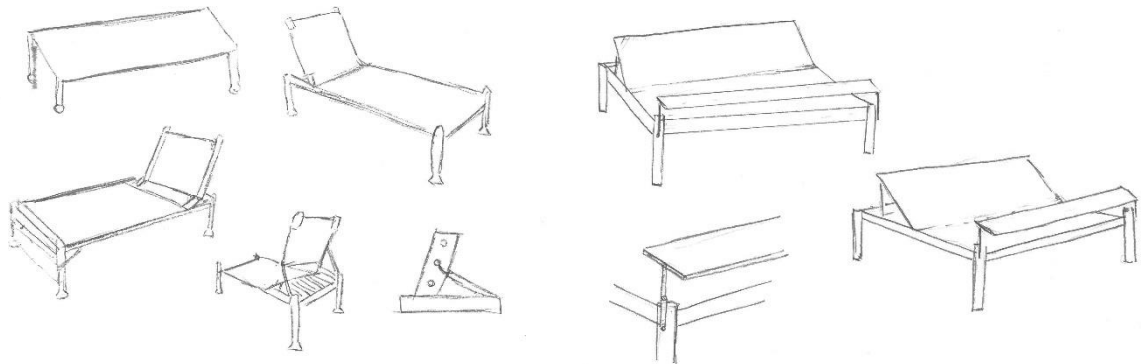


Figure 43 Development of concept sketches



Figure 44 Rendering of willow bed



Figure 45 Side view of willow bed

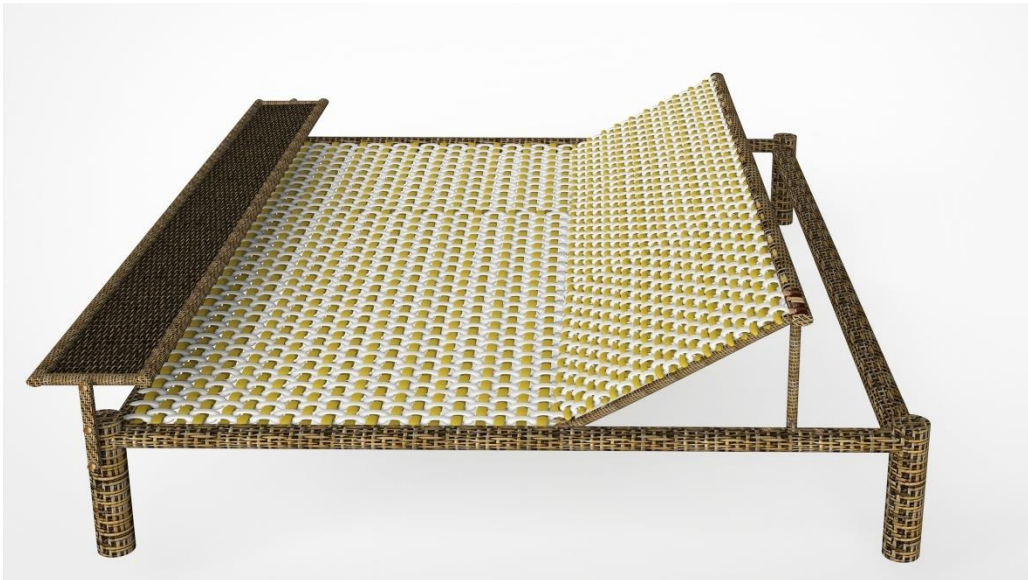


Figure 46 Closeup view of willow bed and wool knitted surface

7.1.1 Designing/making the frame

Considering local materials, I chose willow wood for the bed frame, drawing on the prominence of willow weaving as a craft in the UK.

Brief history of willow weaving

Willow weaving is an ancient craft that has been in use for thousands of years. Within the British Isles, the earliest historical records of willow weaving date from the Mesolithic (approximately 8,000 to 10,000 years ago). Somerset and East Anglia have traditionally been

important willow weaving centres, as their climate and soil are particularly suitable for willow growing. From historical records, we know that the work of British willow weaving artisans was highly valued in Roman times (Carpenter, 2017).

As centuries went by, demand for willow products increased, especially so during the 19th century, when production was at its peak. Moving into 20th century, this craft experienced a decline, which was more noticeable after the introduction of plastic consumer goods in the 1950s. It is estimated that currently there are only 200-500 professional willow weaving artisans in the UK (Carpenter, 2017).



Figure 47 Willow (Source: Norfolk Basket Company)



Figure 48 Willow weaving (Source: Norfolk Basket Company)

However, the making of furniture using willow basketwork techniques is listed in the Red List of critically endangered crafts by The Heritage Crafts Association UK. Currently there is only craftsman/artist continuing the profession. Basketwork furniture has been produced in the willow-growing area of the Somerset levels for centuries. The basketwork furniture industry thrived into the 20th century, to the extent that Athelney station in Somerset was extended around 1906 purely to cope with the growth of the industry (Carpenter, 2017).

Properties of willow

As a craft material, willow is valued due to its softness and pliability. Flexibility makes willow highly resistant to wind and other forms of adverse weather. Moreover, the stems are so flexible that they can be easily bent at hard angles, which is why willow is a great craft material.

Willow shoots have a low density. For this reason, they are commonly used in basketry, where it is important that goods are lightweight and easily handled in everyday tasks.

As Ruth Thompson, Willow Artist from Northumberland states on their website,

“Our experience shows that by interlocking willow branches one can achieve much more than long-lasting functional or decorative items. Willow weaving improves our

well-being by connecting our outer to our inner self. People working with willow find the process grounding and deeply relaxing as it not only engages their hands but also their minds, rooting them in the current moment. But willow weaving not only connects us to ourselves; it also tightens the bond to our surroundings. When working with natural materials we can't help but appreciate the richness of nature. As every branch is different we learn to deal with 'imperfections' and irregularities, a skill which helps us in everyday life" (Thompson, 2024).

Common uses of willow

Weaving is the most common use of willow. Willow baskets are a popular woven product, and can be used to store or transport items at home and in the garden, reducing the need for plastic containers. There are also many other willow products made by various artist and crafts people, some of which are purely decorative, some big size sculptures, some household products like baskets, sieves, pickers, cycle crates, bath chairs, etc. Often, they are also made for individual requirements. This versatile material has other uses, including:

- As a medicinal plant - Willow sap has a high salicylic acid content, which gives it anti-inflammatory properties and makes it a natural aspirin. The willow plant is also used in herbal medicine to treat fever, to promote restful sleep, and to soothe an upset stomach.
- Willow mass is suitable for ethanol production and can play an important role in the plant-based renewable fuel industry.
- Arts and decoration - Woven willow products are not just functional; they're used for artistic and decorative purposes too. Some examples are living willow sculptures, which are used in landscaping, architecture, and interior design.
- Willow is also used to build living fences, garden trellises, hedges, and tool handles.

Material preparation & weaving

Green or freshly harvested willow must be stored upright and allowed to dry for approximately 6 weeks before it can be used for weaving (Toolerstone, 2023).

If only old dry willow is available, soaking the material before working with it is necessary. This involves placing willow bundles in a container large enough to fully cover them with warm

water. Then, weights are placed on top to prevent the rods from floating to the surface. Soaking is complete when the rods can bend at a 90-degree angle without breaking (Toolerstone, 2023).

The next step in material preparation is mellowing. This involves rinsing the rods and wrapping them in a breathable material (ideally fabric). The wrapped rods are then placed upright for at least one day. After this, they're ready to use in most weaving projects (Toolerstone, 2023).

Symbolic and spiritual meanings around willow

In the England, the willow tree has played a significant role in both ecological and cultural traditions, symbolizing various themes ranging from renewal to mourning. The north-west region's wetland landscapes and riverbanks have historically supported willow cultivation, making it an integral part of local life and livelihoods, particularly in the context of traditional crafts and agriculture (Rotherham, 2021). The symbolism of willow in this area reflects both practical uses and deeper cultural associations tied to the natural environment.

- **Renewal and growth** - Willows are traditionally associated with renewal due to their remarkable regenerative ability. As one of the fastest-growing trees, willow has long been used in the North-West for practical purposes such as basket-making, weaving, and pollarding. Its rapid growth and adaptability to different environments make it a symbol of vitality and rejuvenation (Rotherham, 2021; Tree2mydoor, 2024). This connection between willow's growth and community resilience mirrors the local landscape's ability to regenerate and adapt through agricultural and industrial changes.
- **Healing and protection** - Historically, willow was valued for its medicinal properties, especially its bark, which contains salicylic acid - an early form of aspirin. In the North-West, willow trees were often linked to physical and spiritual healing, with branches used in folk practices for protection and purification. Willow was also thought to possess the power to ward off negative energies and provide comfort during times of illness or hardship (Keating, 2021). This belief in the willow's protective qualities contributed to its widespread use in ceremonies and rituals aimed at healing and safeguarding both individuals and communities.
- **Mourning and emotional healing** - The willow tree has a long-standing association with mourning, particularly the weeping willow variety, which is seen as a symbol of sadness, grief, and emotional healing. In the North-West, willow branches were often used in funerary rites and placed on graves to represent remembrance and sorrow (Garnett, 1992). The image of the willow's drooping branches, resembling tears, further solidified its connection to loss and the process of grieving (Keating, 2021). As such, willow trees

are linked to emotional healing, offering a connection to the past and a means of commemorating those who have passed.

- **Cultural and spiritual significance** - In Celtic traditions, the willow tree is also associated with the moon, intuition, and feminine energy. The willow's flexible and graceful nature has long been linked to the cycles of the moon and the feminine divine, symbolizing intuition, sensitivity, and transformation (Tree2mydoor, 2024). In the North-West, local myths and folklore emphasize the willow's connection to mystical and spiritual practices, where it is considered a tree of transformation, used in divination rituals and believed to possess magical properties (Garnett, 1992).

These associations reflect the deep cultural and spiritual significance of willow in the North-West of England, illustrating its role as both a practical resource and a symbol of resilience, healing, and transformation. However, as industrialization has advanced, many of these cultural practices have diminished, leading to a loss of connection to the spiritual and ecological wisdom once embedded in the landscape (Rotherham, 2021).

Additionally, incorporating and advocating spiritual meaning is important as the modern Western world has experienced a profound shift away from deep spiritual connections to nature, a transition marked by secularization and materialism. Historically, many cultures revered nature as sacred and deeply intertwined with spiritual life (Eliade, 1959). However, the Enlightenment era initiated a move towards a more rational and empirical understanding of nature, leading to its treatment as a resource rather than a living entity with intrinsic value (Merchant, 1989; Giddens, 2020). This modern detachment is evident in the prevalent environmental attitudes and behaviours, where industrialization and consumerism contribute to a weakened spiritual bond with nature (Kawall, 2015). Psychologically, this disconnection has been linked to increased anxiety and depression, as living in artificial environments diminishes the sense of meaning and belonging that nature can provide (Wilson, 1986; Hartig *et al.*, 2014).

7.1.2 Designing/making the bed surface

Looking at the properties of willow it was deemed suitable for a bed frame.

Then, I began to consider the woven surface, inspired by my experiences learning knitting after moving to Lancaster and discovering a local community passionate about knitting. I explored the idea of knitting the surface instead of weaving and began to contemplate the materials that could be used for knitting. One prominent material that came to mind is Herdwick sheep wool, native to Cumbria.

Brief history of Herdwick wool

Sheep farming has been part of a traditional way of life for thousands of years in Cumbria as much as the rest of the country. The hand spindle and spinning wheel with the hand loom were a common sight in the home where they were used to spin the wool from a fleece and weave the yarn produced into cloth.

However, Herdwick wool is often considered a by-product with limited commercial value, as it is not typically deemed suitable for high-quality clothing (British Wool, 2022). By utilizing this wool, which is frequently wasted, the project provides farmers with a viable market for their otherwise unsellable wool, thereby improving their economic prospects. This approach not only preserves traditional skills but also fosters local employment and economic resilience, creating fair-wage jobs (Shaw, 1952; Knapp, 2022).

Kendal was known for making yarns, ropes and fabrics from sheep's wool and there are still some SMEs and cooperatives make the yarns and fabrics from wool. From there, I decided to use sheep's yarn to knit the surface.



Figure 50 Herdwick wool (Source: Wingham Wool)



Figure 49 Herdwick wool knitting yarn (Source: Beck Steps Gallery)

Properties of Herdwick wool

Temperature regulating - The Herdwick fleece is a fantastic regulator of body temperature, allowing the Herdwick sheep in the Lake District to stay cool in the summer, and warm in the winter when temperatures on the fells fall to -10°C or less.

Breathable - Herdwick wool is an excellent material for allergy sufferers, with its naturally hypo-allergenic and antibacterial properties makes it easily breathable. It is also antibacterial as the Herdwick wool's ability to absorb and adsorb moisture creates a dry, hostile environment to the growth of bacteria, fungus and dust mites.

Naturally Fire Resistant - Herdwick wool has a higher ignition threshold than many other fibres at around 600°C, meaning it boasts naturally fire-resistant properties.

Water resistance - People have been using Herdwick fleece to make garments for centuries, benefiting from its water resistance and temperature regulation.

Common uses of wool

The Herdwick wool has been used for several purposes from making yarns to making cloths like coats, socks, hats, etc. it is also used to make mattresses. Floor carpet made from the coarse wool were very common.

Wool processing steps

The process of turning a sheep wool into a length of cloth or yarn starts with sheering the wool. After shearing, the fleece is washed in mild soap water to prepare it for carding.

- Shearing - Farmers needs to shear their sheep for health reasons.
- Scouring - The wool is washed, dried and press-packed and sold to yarn spinners for processing.
- Blending – Blending opens the wool up and mixes it evenly while removing dust and any residual dirt.
- Carding - Hand-carding is a traditional method of preparing fleece and fibres for spinning soft, lofty yarns of varying fibre lengths. The purpose for carding is to separate and straighten the wool fibres. The result is a batt or rolag of lofty wool that makes spinning easier. Hand-carders are a pair of wooden paddles with wire faces. The wire teeth are either course or fine depending on the wool.
- Spinning - Wool that has been carded is attached to a large spinning wheel which has a foot peddle connected. The wheel spins forward through the action of the pedal. As the wool is held at arm's length, the spinning wheel 'twists' the wool into yarn.
- Dyeing the yarn – Mostly the yarn is hand-dyed in natural plant dyes, however dyeing in synthetic dyes also not uncommon. Some of the Herdwick wool is sold un-dyed as it has special grey colour shades and difficult to dye.

Symbolic and spiritual meanings around sheep and wool

Sheep and sheep wool hold various spiritual symbolisms across different cultures and beliefs:

- Innocence and Purity - Sheep are often associated with innocence and purity due to their gentle nature and white wool. In some spiritual traditions, they symbolize qualities like purity of heart, gentleness, and harmlessness (Garcia, 2018) .
- Sacrifice and Redemption - In many religious contexts, sheep have symbolized sacrifice and redemption. This symbolism originates from ancient rituals where sheep were offered as sacrifices to deities as a way to atone for sins or seek divine favour(Sheshadri, 2014).
- Protection and Provision - Sheep provide wool, meat, and milk, making them symbols of provision and sustenance. In spiritual contexts, they may represent divine provision and protection, as well as the idea of being cared for and nurtured by a higher power (Hassett, 1910).
- Community and Unity - Sheep are social animals that live in flocks and rely on each other for protection and survival. As such, they symbolize community, cooperation, and unity. In spiritual teachings, they may represent the importance of belonging to a supportive community and working together for common goals(Sheshadri, 2014; Garcia, 2018).
- Fertility and Abundance - Due to their ability to reproduce and provide resources like wool and milk, sheep are often associated with fertility and abundance. In some cultures, they symbolize prosperity, growth, and the cyclical nature of life (Sheshadri, 2014).

Overall, the symbolism of sheep and sheep wool varies widely depending on cultural, religious, and spiritual beliefs, but they are often associated with positive qualities such as innocence, provision, community, and spiritual guidance.

Nowadays there is increased interest in attending workshops to learn willow weaving, knitting, yarn making, dyeing with natural dyes as I have encountered many workshops around these practices.

For dyeing in Lancaster, the Natural Dye Project is a prominent series of workshops conducted by Sewing Cafe Lancaster. The project was set up to explore the feasibility of natural dyes in Lancaster and Morecambe and to raise awareness of the toxic effects of industrial dyes on the environment and implications for health. The aim was to promote 'small scale' potential for using natural dyes as tools to enhance or upcycle fabric/clothes and recognise the connection with process, seasons and the soil. They use techniques that minimise the use of water along with renewable growing practices on either wool grown in a farm 2.82 miles from Lancaster or

recycled cotton and linen sheets that otherwise would have ended up in landfill. Their workshop consisted of providing the experiences of the full process of harvesting, preparing, dyeing and revealing the work of participants. It also involved the plantation of particular plants and flowers which also helped increased the biodiversity of that particular farm in Lancaster (Inkblatt, 2020).

Reading about the Natural Dye Project, prompted me to also considered the possibility of combining learnings from different case studies. I started to look at the *chindi* rugs and started to draw and sketch out the details in similar way to charpai. This encouraged me to think about the clothing waste generated in Lancaster. According to Eve Parr, Lancaster district residents generate more than a million kilograms of clothing waste each year, which is often shipped abroad for disposal (Parr, 2022). Therefore, the old cloths can be used to make the yarns to knit the bed surface.

Additionally, using the similar technique plastic wrappers can be converted into the yarns by upcycling one time use plastic.

After learning about the properties of wool, it became evident that it was the best-suited material for the bed. I began mapping out the various activities and stakeholders involved in making the bed, aiming to create a process that revolves around the local production-to-consumption system, which is meaningful and holistic.

As observed in the case of the *charpai*, making a bed involves several stakeholders. Additionally, there are workshops available for most of these activities, allowing consumers to participate at various stages. This engagement fosters connections and fosters deep meaning around the final product.

Furthermore, many workshops around willow weaving and wool making are held during weekends and holiday periods in Lancaster and Cumbria district, offering many opportunities to develop traditions and rituals around each activity and the ceremonial use of the products. For example, activities such as harvesting flowers and plants for natural dyeing typically occur in spring, making it an ideal time to celebrate the season of new growth or align with Easter for those with Christian religious beliefs. Similarly, several rituals and traditions can be developed around the process of creating the bed and related products, fostering a sense of community, connection, and meaning. Some of the ways this can be done are:

- By organising harvesting rituals and seasonal gatherings for harvesting materials like wool from local sheep or plants for natural dyeing. These events can be accompanied by ceremonies celebrating the beauty of nature and the start of a new season, it can also incorporate local and seasonal foods.

- By arranging regular collaborative crafting sessions where community members come together to work on different aspects of the bed making or related products. These sessions can promote collaboration, skill-sharing, and a sense of collective accomplishment.
- By organising a special event to unveil the finished products, such as the bed frame or woven surface. These gatherings can include storytelling about the materials used, demonstrations of traditional techniques, and opportunities for community members to try out the products.
- By offering personalized customization options for the products, where customers can choose specific features, colours, or designs for their items. By creating opportunities for repair and upgradation, for example people can tighten or replace the knitted surface when it gets saggy. These rituals can involve consultations with skilled makers and the symbolic marking of the customization choices or repair.
- By encouraging the practice of giving locally crafted items as gifts for special occasions such as weddings, birthdays, or Christmas. This tradition can highlight the value of handmade, meaningful gifts and support local production-to consumption ecosystem.
- By making special items, limited-edition items or by hosting workshops for different seasons or holidays. And by creating things inspired by the time of year or holiday-themed items.
- By getting involved in regular community gatherings, local festivals, artisan markets, weekly markets and hands-on workshops, fostering a sense of pride and connection within the community.
- By connecting folklore in the form of music, dance, song, and artwork, fostering storytelling, and sharing narratives around traditional making practices, their histories, heritage, materials preparations, skills, process etc. This will help the local community connect more with products.

By weaving rituals and traditions into the process of creating and sharing locally crafted products, it is possible to deepen the sense of meaning, belonging, and cultural identity associated with these items.

This illustrates the tangible example of what and how we can learn from traditional practices for holistic sustainable and meaningful future.

The willow bed demonstrates that contemporary product design can learn from traditional knowledge and practices to create more sustainable products. The willow bed design proposal

draws on the traditional knowledge and use of a natural resource rooted in cultural heritage. By reinterpreting its beneficial features into a recognisable, modern product, it demonstrates a different way to conceptualise and develop future products. (Cloete, 2020). However, it is worth noting that adapting the willow bed to contemporary needs might present challenges, especially in regions like the UK. In Western countries, including the UK, the spiritual and symbolic meanings traditionally tied to everyday products have been increasingly lost due to secularization, industrialization, and the rise of consumer culture (Merchant, 1989; Giddens, 2020). As societies shifted towards materialism and practicality, the deep cultural and spiritual connections once associated with objects faded, especially with the standardization brought by mass production (Wilson, 1986). Urbanization further distanced people from nature, weakening the bond with natural materials that once carried symbolic value (Hartig *et al.*, 2014). This detachment from the spiritual dimensions of products has led to a lack of awareness and emotional connection, contributing to feelings of alienation and diminished purpose in modern life (Kawall, 2015).

Design can navigate these challenges by fostering a deeper connection to cultural heritage and encouraging consumers to reconsider their relationship with the products they use daily. By integrating symbolic meanings and sustainability into product design, designers can create more meaningful and impactful solutions. The willow bed invites us to rethink our practices substantially and bed offers a tangible example of how and what design can learn to holistically contribute to a meaningful sustainable future. Building on the insights gained from designing the bed, designers can also explore new product ranges utilising similar local skills and materials including baskets, wine bottle boxes, hampers, trays, side tables, benches for public places, and customized items.

In the table below, the willow bed is presented through the lens of adapted QBL, making sure all the elements of QBL are fulfilled.

Table 17 The willow bed through the lens of adapted QBL

<p>Practical Meaning: utilitarian needs and environmental consideration.</p>	Practical application	<ul style="list-style-type: none"> It is a multifunctional product which can be used as a bed during the night, sofa during daytime and a dining table to consume meals.
	Local materials	<ul style="list-style-type: none"> It is made with willow wood, Herdwick sheep's wool yarn or upcycled old cloths, natural dyes.
	Local manufacturing	<ul style="list-style-type: none"> It is co-created by several people at several stages. It involves five major steps Preparing willow, weaving willow bed frame, preparing wool, dyeing wool and lastly knitting bed surface. It is made using only two materials, including the joinery components for bed frame.
	Energy usage	<ul style="list-style-type: none"> The bed is handmade using minimal tools thus requires minimal to no energy for making.
	Longevity	<ul style="list-style-type: none"> The willow frame will last for 10-12 years without maintenance. (The Willow Farm, 2021). Sheep wool lasts for decades.
	Maintenance, Repair	<ul style="list-style-type: none"> Willow requires no maintenance at all. Woollen knitted surface may get saggy over use and can be tightened.
	Upgrade, Customise	<ul style="list-style-type: none"> Size of bed can be customised and wool can be dyed in preferred colours along with personalised knitted patterns
	Disposal	<ul style="list-style-type: none"> As the bed is made from just two materials without additional components, willow and wool can be easily composted after use.
<p>Personal Meaning: inner values, conscience, spirituality.</p>	Self-expression, identity	<ul style="list-style-type: none"> Through the process of hand-making, makers gain a sense of self-expression and a unique identity. Buyers gain value and pride in traditional practices and develop bonds with both the product, as using it requires manual effort.
	Historical significance	<ul style="list-style-type: none"> Both the materials carry historical significance.
	Ceremonial use	<ul style="list-style-type: none"> This includes organizing seasonal harvesting rituals, collaborative crafting sessions, and special unveiling events that celebrate the craftsmanship and cultural heritage. Additionally, the bed can be featured in community festivals and markets, fostering pride and connection to local traditions.
	Spiritual values & beliefs	<ul style="list-style-type: none"> Both materials hold spiritual values. Which can be shared with communities during workshops and via social media platforms.
	Rituals	<ul style="list-style-type: none"> Personalization for special occasions and regular maintenance rituals further deepen its symbolic value. The willow bed can be part of various rituals, including seasonal harvesting ceremonies for gathering materials, collaborative crafting sessions and unveiling events that celebrate the completed bed.
	Health benefits	<ul style="list-style-type: none"> The gentle process of willow weaving is an acknowledged therapy for people with PTSD and other forms of mental distress. Its therapeutic effect has been found to make them happier, more confident and distract from both mental and physical pain (Thompson, 2024). Wool helps to regulate body temperature. Wool also efficiently wicks away moisture keeping it dry and making

		it hypoallergenic and antibacterial (The Herdy Company Ltd, 2023b).
Social Meaning: community, compassion, equity and justice.	Local culture	<ul style="list-style-type: none"> • It involves local culture through its use of traditional materials and techniques. • It engages local artisans and communities in its creation. • This process fosters a sense of pride and connection to local heritage, reflecting and preserving regional skills, values, and traditions.
	Community Involvement	<ul style="list-style-type: none"> • Project actively involves the community by hosting workshops where local artisans and residents collaborate on crafting techniques. • Seasonal events celebrate traditional practices. • Customization options and repair services engage community members in personalizing and maintaining their beds. • Celebratory unveilings of the completed beds further strengthen community ties by sharing the cultural significance and collective achievement of the project.
	Co-creation and co-dissemination	<ul style="list-style-type: none"> • It involves local artisans and community members collaborating on design and production. • The project also fosters co-creation through workshops and events, sharing knowledge.
Economic Means: financial viability and ethical income generation.	Local production-to-consumption system	<ul style="list-style-type: none"> • It integrates local materials and craftsmanship into its design. • Willow and the wool are harvested and processed locally. The making workshops are held locally. • Bed is made and used locally. • It involves local willow farmers, sheep farmers, willow makers/artists, wool spinners/ yarn makers, knitters, natural dye makers, workshop organisers and overall general community.
	Ethical practice	<ul style="list-style-type: none"> • It involves ensuring fair treatment of all stakeholders involved, from sourcing materials to supporting local artisans through fair wages. It includes transparency in the production process and respecting cultural traditions. This approach fosters trust, supports community well-being, and promotes responsible consumption and production.
	Livelihood & Job creation	<ul style="list-style-type: none"> • The willow bed project supports livelihood and job creation by engaging local artisans and craftspeople in its production. • By sourcing materials locally and promoting local craftsmanship, the project helps sustain and grow local economies, providing fair wages and fostering economic resilience.
<ul style="list-style-type: none"> • Ensure all the elements of the QBL are fulfilled 		

7.2 Reflections on the willow bed

The extensive exploration and the process of designing the willow bed by incorporating learnings from traditional knowledge offers valuable insights for design. It underscores the importance of holistic thinking, collaboration, and engagement with local resources and practices to create products that are not only functional but also meaningful.

The design process involved questioning biases and assumptions surrounding sleeping arrangements and modern product design. By challenging the notion of what constitutes a bed and reimagining its form and functionality, the design transcended conventional paradigms. This critical inquiry led to authenticate insights from the case studies and the interview synthesis.

The reflective process for the willow bed design is deeply rooted in Constructivist and Interpretivist paradigms, which emphasize that knowledge is co-created through experience, context, and interaction. These paradigms align with the iterative, collaborative, and context-sensitive nature of the design process, wherein traditional knowledge, cultural practices, and local ecosystems are not merely observed but actively engaged with and reinterpreted.

7.2.1 Knowledge transmission

The design process exemplifies the transmission of traditional techniques and skills, as well as the preservation of cultural traditions. By studying and adapting the weaving patterns, construction techniques, and cultural significance of the *charpai*, valuable knowledge was passed down and incorporated into the modern design of the willow bed. The design process demonstrated the value of leveraging traditional wisdom to address contemporary challenges. By tapping into the rich heritage of willow weaving and sheep farming, the design created a modern solution that is deeply rooted in local culture and environment fostering the sense of community by co-creation. Also, the amalgamation of distinctively different cottage industries and making skills such as willow, wool making, knitting communities offers insights into how ancient knowledge can inform sustainable practices and holistic design solutions. The design process also serves as a bridge between cultural, geographies and context divides, by integrating elements of diverse traditions and practices in respectful and ethical manner.

Therefore, it is necessary to document and preserve traditional knowledge and practices and share those for collective ethical use.

7.2.2 Local production-to-consumption ecosystem

The emphasis on community engagement, co-creation, and co-dissemination reflects a holistic approach to product design within the local production-to-consumption ecosystem. Through collaboration with local craftspeople, artisans, makers, knitters and consumers, relationships can be fostered, and a sense of ownership and pride in the product can be cultivated. This holistic ecosystem will nurture meaningful connections and supports sustainable practices from production to consumption.

A production-to-consumption system includes the “the entire set of actors, materials and institutions involved in growing and harvesting a particular raw material, transforming the material into higher-value products, and marketing those products” (Belcher, 1998, p. 59).

A production-to-consumption system includes three dimensions—the physical flow of materials, the set of players whose hands the materials flow through, and the labour and capital involved in these processes (Belcher, 1998).

This value-based economic approach moves beyond profit-driven models, focusing on ethical, sustainable practices and fostering long-term product usage, repair, and customization. As QBL suggests, economics is a means, not a mode - it's a tool to support systems that value well-being over mere financial gain. Twigger Holroyd's concept of 'design for domestication' highlights how products can evolve as part of daily life, with consumers deeply involved in their production (Twigger-Holroyd *et al.*, 2015). This shifts the economic model from passive consumption to active, localized craftsmanship, promoting economic resilience, reducing waste, and strengthening community bonds.

7.2.3 Developing meaningful culture, values, and rituals

The design process prioritized the development of meaningful culture, values, and rituals surrounding the product and its production. By incorporating seasonal gatherings, crafting sessions, and personalized customization options, traditions were established, fostering a sense of community and cultural identity. These rituals enrich the product experience and deepen its significance within the local context.

7.2.4 Transparency and honesty of material use, manufacturing

The design approach upheld transparency and honesty in material use and manufacturing processes. By prioritizing local materials, simple tools, and minimal components, the design embraced sustainability and minimized environmental impact. This commitment to transparency and simplicity promotes ethical consumption practices and highlights the value of locally sourced, responsibly produced goods.

7.2.5 Notion of repair, reuse, reduce, multiuse, and longevity

The design philosophy embraced the principles of repair, reuse, reduce, multiuse, and longevity. By creating a product with durable materials and adaptable features, the design encourages long-term use and minimizes waste. Additionally, the incorporation of repair and customization options extends the lifespan of the product, promoting sustainable consumption habits and reducing environmental footprint.

7.3 Radically rethinking design: prioritizing meaning and connection over materialism

The willow bed prompts us to radically question our contemporary lifestyles, challenging our approach to sleeping, making, buying, and disposing of beds and other everyday products. It urges a re-evaluation of our needs and wants critically. Firstly, it challenges our inclination towards efficiency and convenience over authenticity, quality, and sufficiency. By integrating rituals and traditions into the designs and sharing of locally crafted products, it calls for a reassessment of our relationships with the items we use daily. Rather than viewing these products solely as commodities, the emphasis is on recognizing them as embodiments of cultural identity and community values. This challenges consumerist attitudes and encourages a shift towards prioritizing meaning and connection over material accumulation.

Moreover, the emphasis on repair, reuse, and upcycling disrupts the prevailing linear model of consumption and disposal. Instead of regarding products as disposable, it advocates for a holistic approach where items are designed for longevity, multifunctionality and adaptability. This prompts reflection on the throwaway culture that drives overconsumption and waste generation.

It urges us to challenge existing norms and practices, consumerist attitudes and encourages a shift towards prioritizing meaning, holistic well-being and connection over material accumulation by considering alternative ways of living. The consideration of 'personal meaning', is a key contribution of Walker's QBL (Walker, 2011a), and offers more valuable insights into designing more sustainably. Yet it is not addressed in existing, mainstream contemporary approaches. Approaches like 'Emotionally Durable Design' do incorporate personal meaning to some extent albeit in a slightly different way by focusing on the emotional experiences and attachments that users develop with products over time, whereby product attachment may extend the lifespan of products and reduce consumption.

Through the products included in the case studies, it is apparent that personal meaning is very much embedded within the object. Cultural and spiritual meanings are ascribed to these seemingly simple and entirely necessary objects. The cultural meanings are conveyed through both the production methods, which mirror local styles and materials, and the practices which are embedded within communities and places. Furthermore, the spiritual meanings of the objects are inherently present in the objects whether through their use, such as in Hindu ceremonies, or in their representation in folk or religious stories. The objects explored in this research also emphasise the connection between 'personal meaning' and other elements of sustainability. For example, deteriorating ecosystems have been linked to a degradation of these deeper understandings of meaning as well as cultural identity and a variety of other factors related to the well-being of the individual (Corvalan *et al.*, 2005). However, it is difficult to just add a personal meaning to a product, as it is a complex and multidimensional task that plays a crucial role in creating products that resonate with users on a deeper level. We can attempt to add personal meaning to a product in several ways such as by incorporating cultural relevance, by embedding stories and narratives, emotional connections, by personalisation and customisation, by developing rituals and practices around products and by co-creation and collaboration.

The willow bed provides a tangible example of how this can be incorporated while designing new products which lead to considering radically different ways of living. From these insights, it is apparent that design needs to focus on rethinking everyday practices rather than just focusing on redesigning 'greener' products. While designing those practices, designers should engage with local communities in order to understand their needs, culture and ways of living. Most of the eco-modern approaches to design focus on redesigning existing objects in more environmentally friendly ways by reconsidering their materials, manufacturing processes, lifecycle assessment etc. (Crul and Diehl, 2006). However, redesigning the practice may result in

more meaningful sustainable ways. For example, rather than designing 'environmentally friendly' and 'greener' toothbrushes and toothpastes, design can critically re-evaluate the practice of brushing the tooth and redesign new ways of maintaining oral hygiene which accords with QBL (see (Changede, Thomas and Walker, 2022)). This echoes Papanek who stated that "Design, if it is to be ecologically responsible and socially responsive, must be revolutionary and radical in the truest sense. It must dedicate itself to nature's principle of least effort, in other words, maximum diversity with minimum inventory ... or doing the most with the least. This means consuming less, using things longer, and being frugal about recycling materials. The insights, the broad, nonspecialized, interactive overview of a team ... that designers can bring to the world must now be combined with a sense of social responsibility. In many areas designers must learn how to redesign. In this way we may yet have survival through design" (Papanek, 1985, pp.346–347).

7.4 Summary

This chapter addresses the research objective: To design a contemporary everyday product that incorporates insights from traditional Indian products and practices and determine how the product accords with sustainability principles.

The chapter builds on the findings from chapter 6 and provides an in-depth reflection on the design and creation of the willow bed, a contemporary product inspired by traditional Indian *charpai* techniques and local British crafts such as willow weaving and the use of Herdwick wool. The chapter highlights the integration of traditional knowledge within the UK context. Key sections discuss the practical application of traditional techniques, the creation of the bed frame and surface, and the development of related rituals and traditions. The chapter concludes with a synthesis of insights, emphasizing the broader implications for sustainable product design and presenting the willow bed through the adapted QBL framework. The chapter advocates for a shift in consumer attitudes, emphasizing the importance of meaning and connection over material accumulation. This approach challenges the throwaway culture and promotes meaningful and sufficiency-oriented living practices.

By reflecting on the design process and outcomes, this chapter illustrates how traditional knowledge can be effectively integrated into contemporary product design, resulting in solutions that comply with holistic and meaningful sustainability principles. The willow bed serves as a tangible example of how traditional practices can inform modern, sustainable design, offering valuable insights for future projects.

Chapter 8 Conclusions

8 Conclusions

This chapter provides general conclusions to the body of research covered in the thesis; it is structured as follows:

- An overview of the research findings and answers to the main research question and discuss the findings in relation to six research objectives.
- Contribution to knowledge of this research.
- The limitations of the study
- Future research
- Concluding remarks

8.1 Overview of the research findings

This study is centred on the main research question: **What can Design for Sustainability learn from traditional Indian products and practices?**

The following six research objectives were set to drive the research project, and outlined the specific steps to answer the main research question, namely:

1. To develop a critical understanding of modern approaches to Design for Sustainability
2. To consider the relationship between traditional knowledge, sustainability and design, with a focus on the Indian context.
3. To identify and document traditional Indian products and practices that are still relevant to contemporary lifestyles through autoethnographic case studies.
4. To conduct a detailed analysis of selected traditional Indian products and practices to assess to evaluate their alignment with sustainability principles, including evaluations of materials, production processes, and lifecycle considerations, and to highlight sustainability aspects through comparative studies with modern equivalents.
5. To conduct interviews with contemporary design professionals in India to understand their motivations and inclinations towards traditional crafts and sustainable design.
6. To develop a comprehensive framework for designing holistic and meaningful products, based on insights from objectives 3, 4 and 5.
7. To design a contemporary everyday product incorporating insights from traditional Indian products and practices – and evaluate to determine its compliance with sustainability principles.

The below section discusses how each research objectives were achieved.

- 1. To develop a critical understanding of modern approaches to Design for Sustainability**
- 2. To consider the relationship between traditional knowledge, sustainability and design, with a focus on the Indian context.**

Chapter 2 reviews modern Design for Sustainability approaches and traditional Indian knowledge to address the first research objective. It traces the evolution of sustainability concerns from historical contexts to the Industrial Revolution and critiques modern frameworks like Natural Capitalism and Cradle-to-Cradle for neglecting social and cultural dimensions. While methods like Biomimicry and Ecodesign address environmental criteria, they miss deeper human values. Emotionally Durable Design and Design for Sustainable Behaviour align with sustainability principles but lack a holistic approach. The Quadruple Bottom Line (QBL) framework, which includes economic, social, environmental, and personal dimensions, addresses these gaps. The literature review around traditional knowledge highlights its significant contributions to sustainable development, emphasizing resource management, environmental stewardship, and cultural values. Examples such as biodegradable sanitary pads and zero-energy terracotta refrigerators illustrate how traditional practices can inspire sustainable solutions.

The literature review reveals gaps in current sustainability approaches, including their limited scope and neglect of human values. Traditional knowledge remains underutilized despite its potential to provide context-specific and sustainable insights. This chapter reaffirms the importance of integrating ecological, cultural, social, and personal dimensions into sustainability frameworks. The QBL framework is identified as a promising model for developing context-specific and culturally resonant solutions, bridging the gap between traditional practices and modern design. This foundation sets the stage for further research into how traditional Indian practices can enhance contemporary Design for Sustainability.

- 3. To identify and document traditional Indian products and practices that are still relevant to contemporary lifestyles through autoethnographic case studies.**
- 4. To conduct a detailed analysis of selected traditional Indian products and practices to assess to evaluate their alignment with sustainability principles, including evaluations of materials, production processes, and lifecycle considerations, and to highlight sustainability aspects through comparative studies with modern equivalents.**

Chapter 4 effectively addresses these two primary research objectives. For RO 3, the autoethnographic method was employed, involving a review of everyday life in rural India

through personal and professional experiences. This method, detailed in Chapter 3, led to the identification of six traditional Indian products and associated practices, documented through narrative inquiry, and presented as case studies in section 4.3. These case studies highlight the relevance of traditional practices such as food preparation, cooking, cleaning, and textile production to contemporary lifestyles. For RO 4, the selected traditional products were analysed using the adapted Quadruple Bottom Line (QBL) framework, which assessed their alignment with sustainability principles, including materials, production processes, and lifecycle considerations. This analysis revealed that traditional products are more sustainable than modern equivalents due to their multi-use functionality, minimalistic design, reliance on natural and local materials, and ease of maintenance and repair. The findings identified five key thematic areas: knowledge transmission, local production-to-consumption ecosystems, nurturing cultural meaning, transparency in material use, and longevity and resource consciousness.

5. To conduct interviews with contemporary design professionals in India to understand their motivations and inclinations towards traditional crafts and sustainable design.

Chapter 5 addresses RO 5 by interviewing contemporary design professionals in India to explore their motivations and inclinations towards traditional crafts and sustainable design. The interviews reveal a deep passion for craftsmanship, driven by personal experiences, education, and global exposure. Designers emphasize the importance of preserving traditional craft knowledge and integrating it with modern design practices, showcasing their commitment to sustainability.

Key findings include diverse approaches to market targeting, advocacy for local production ecosystems, and the preservation of cultural meaning. Despite challenges such as technical literacy and production constraints, designers are overcoming these through collaboration and education. Their focus on using natural materials, ensuring transparency, and promoting longevity aligns with sustainable design principles.

Overall, the chapter highlights how traditional crafts, when combined with contemporary design, contribute to innovative and sustainable solutions. The insights from these interviews reinforce the case study findings, demonstrating the potential of traditional practices to enhance holistic and culturally relevant design.

6. To develop a comprehensive framework for designing holistic and meaningful products, based on insights from objectives 3, 4 and 5.

Chapter 6 addresses RO 6 by creating a comprehensive framework for designing holistic and meaningful products. It integrates insights from the case studies (Chapter 4) and interviews (Chapter 5), focusing on five key themes: knowledge transmission, local production-to-consumption ecosystems, cultural meaning, transparency and material honesty, and longevity and resource consciousness. The framework incorporates Walker's adapted QBL. This adaptation intends to provide clearer guidance for designers, offering specific criteria and components under each aspect.

The chapter highlights what learnings from traditional knowledge can enrich contemporary product design. It emphasizes the economic and community benefits of local production systems and the role of traditional crafts in promoting cultural relevance and holistic well-being. It also addresses the importance of ethical practices, such as transparency and material honesty, showing how traditional methods align with these principles. Principles of longevity and resource consciousness are examined, demonstrating how traditional designs exemplify durability and sustainability.

By incorporating the adapted QBL framework, the chapter provides practical guidance for creating products that are culturally resonant, economically viable, and environmentally sustainable. This comprehensive approach bridges theoretical principles with actionable design strategies, offering a pathway for designers to develop products that are meaningful and holistically sustainable.

7. To design a contemporary everyday product incorporating insights from traditional Indian products and practices – and evaluate to determine its compliance with sustainability principles.

Chapter 7 addresses RO 7 by presenting the design of the willow bed, a contemporary product that integrates learnings and framework from chapter 6. The design of willow bed takes inspiration from Indian *charpai* techniques to the UK context, utilizing willow wood and Herdwick wool to reflect local craftsmanship and sustainable practices. By engaging in community workshops and collaborative crafting, the design process emphasizes the preservation of traditional skills and materials. The willow bed is evaluated through an adapted QBL framework, highlighting its adherence to sustainability principles. The chapter reflects on key aspects of the design process, including the transmission of traditional knowledge, local production systems, cultural significance, transparency in material use, and principles of longevity. It advocates for a shift from consumerist attitudes towards valuing meaning and holistic well-being, suggesting a reconsideration of everyday practices and product design.

Overall, the willow bed exemplifies research question ‘What can Design for Sustainability learn from traditional Indian products and practices?’

8.2 Contribution to Knowledge

This section discusses the contribution of this study to knowledge.

8.2.1 Integrating interdisciplinary knowledge

This research significantly advances the understanding of traditional Indian products and practices in relation to holistic sustainability, offering insights that are valuable to Indian craft communities, global design researchers, and commercial design practitioners. By employing a mixed-methods approach - encompassing autoethnography, interviews, and case studies - this study makes the following contributions:

- **Comprehensive documentation of traditional practices**

The research provides a rich documentation of diverse traditional products and everyday practices within the Indian context, creating a valuable resource for designers and researchers seeking inspiration from cultural heritage.

- **Exploration of the relationship between traditional crafts and sustainability**

By examining the intersection of Indian designers, traditional crafts, and sustainability, this study highlights how cultural values such as resilience, spirituality, and harmony with nature shape design and business practices.

- **Identification of key values for sustainable design**

The research identifies significant values that influence sustainable practices, offering insights that can inform design processes globally while respecting local cultural nuances.

- **Opportunities for holistic sustainability in design**

Practical pathways for integrating traditional knowledge into contemporary design practices are outlined, providing actionable strategies for fostering sustainability in diverse design contexts.

- **Applicability and impact**

The findings of this research are particularly relevant in the following contexts:

Indian craft communities: The study emphasizes the importance of preserving and adapting traditional practices to promote local economic resilience, cultural continuity, and sustainable production methods.

Global design research and education: The principles and frameworks developed can inform design education and research, especially in contexts that aim to integrate diverse cultural perspectives into sustainable design practices.

Commercial design practices: Designers in both India and international contexts can use the identified principles to embed sustainability into their products and services, enhancing ethical and environmentally conscious design processes.

Dissemination of findings

The contributions of this research have been shared through two journal articles and three peer-reviewed conference papers (see Declaration on page 11). These publications reinforce the significance of the study in advancing sustainable design discourse and integrating traditional knowledge into modern practices.

By bridging interdisciplinary insights from design for sustainability literature, cultural studies, and craft practices, this research enhances cutting-edge scholarship and offers practical, impactful frameworks for design that align with both cultural heritage and contemporary sustainability imperatives.

8.2.2 Contribution to the theoretical framework development

This thesis makes several significant contributions to the field of sustainable design by bridging the gap between traditional Indian practices and contemporary design approaches. The key contributions of this study are as follows:

- **A Holistic framework for designing meaningful sustainable contemporary products**

This research presents a comprehensive framework for designing contemporary products that integrate insights from traditional Indian products and practices. The framework offers a structured approach for designers to incorporate context specific sustainable resource management, resilience, spiritual values, rituals, and harmony with nature—principles deeply rooted in traditional Indian wisdom. By embedding these principles into modern design

processes, the framework facilitates the creation of products that are not only ecologically sustainable but also culturally relevant and socially equitable.

- **Example of a contemporary products incorporating traditional insights**

The thesis provides an example of a contemporary everyday product (The Willow Bed) that has successfully integrated insights from traditional Indian products and practices. This example demonstrates how traditional knowledge can be effectively adapted to modern contexts, resulting in designs that align with holistic sustainability principles. By analysing the case studies, the research identifies specific elements of traditional design that enhance sustainability, such as material efficiency, longevity, and user engagement, and evaluates their impact on the overall sustainability of the designed products.

- **Adapted Quadruple Bottom Line (QBL)**

Building on existing sustainability frameworks, this study adapts the Quadruple Bottom Line (QBL) by offering practical guidance that enhances its accessibility. The adapted QBL framework offers a more holistic approach that incorporates various dimensions of personal meaning to design meaningful and holistically sustainable products that align with insights gained from traditional Indian products and practices. This contribution enhances the applicability of the QBL in diverse cultural contexts and promotes the creation of more meaningful and impactful sustainable design solutions.

8.3 Limitations

The insights and findings are primarily drawn from a limited number of case studies and interviews, which, while illustrative, may not fully represent the broader diversity of traditional Indian practices or contemporary design approaches. The focus on specific examples might not capture the full range of techniques, materials, or cultural nuances present in Indian craftsmanship or global design practices.

The autoethnographic approach used in this thesis provided valuable insights for integrating traditional Indian practices into contemporary design but has notable limitations. The inherent subjectivity of autoethnography means that the findings are heavily influenced by the researcher's personal experiences and interpretations, which introduces bias. Additionally, the focus on personal reflection may constrain the exploration of broader systemic or external factors, potentially overshadowing other important perspectives. The effectiveness of this approach is contingent upon the researcher's capacity for critical reflection, and any limitations

in this area could impact the depth and accuracy of the insights. These factors underscore the need for complementary research methods to achieve a more comprehensive understanding and highlight the importance of addressing biases and maintaining critical self-awareness in autoethnographic research.

The framework developed for Holistic Design for Sustainability, while comprehensive, may face challenges in practical application across diverse design projects. The integration of traditional knowledge with contemporary practices involves navigating cultural appropriation concerns, which may not be fully addressed within the scope of this research. The question of scaling traditional knowledge is particularly complex: Scaling traditional practices to address global challenges such as climate change, late capitalism, and industrialization risks undermining the inherent value of traditional craftsmanship. Traditional practices often thrive in localized, community-based contexts, and upscaling them may inadvertently contribute to the very unsustainability they seek to counteract, such as resource overuse or cultural appropriation. This research recognizes that not all traditional practices need to scale. Instead, their value may lie in offering principles and localized solutions that inspire or complement broader sustainable strategies. Further dialogue on when, where, and how traditional knowledge might scale without compromising its essence is critical for ensuring its alignment with sustainability goals.

The integration of traditional knowledge with contemporary practices raises concerns about cultural appropriation, which may not be fully addressed within the scope of this research. Ensuring that traditional knowledge is adapted respectfully and ethically requires a nuanced understanding of the communities involved and ongoing dialogue with stakeholders.

While the study provides theoretical insights and illustrative examples, there is a need for empirical validation of the proposed framework and design of willow bed. Field testing and practical implementation studies are required to evaluate the effectiveness and adaptability of the framework in real-world design projects. Additionally, the proposed design solutions and frameworks, while theoretically sound, may encounter practical challenges in implementation. Issues such as scalability, cost, and market acceptance of traditional techniques in contemporary settings may not be fully addressed within the thesis.

Although some findings have been validated through peer-reviewed research papers and presentations at international conferences, additional rounds of validation with experts, craft communities, and other stakeholders would strengthen the applicability and impact of this work. Time constraints limited the ability to conduct further validation during the research period.

The thesis acknowledges the inherent tension within sustainable design research and practice: addressing global challenges like climate change and industrialization requires systemic solutions, but scaling those solutions often risks perpetuating unsustainable practices. This research positions traditional knowledge as a complementary rather than exhaustive solution, emphasizing its potential to inform localized, culturally attuned strategies that resist the homogenizing effects of globalization. The frameworks developed here aim to spark dialogue and inspire incremental shifts toward sustainability rather than serve as universal solutions.

8.4 Future Research

Building on the insights and findings of this thesis, several avenues for future research will emerge, both for myself and for peers in the fields of sustainable design, traditional knowledge, and cultural practices.

As I move forward from this research, I will continue to explore the integration of traditional knowledge into contemporary design practices. One of my immediate plans is to collaborate with Lancaster communities to co-develop products, including the Willow Bed, that embody the principles outlined in this thesis. This work will bring the frameworks developed in this research into practical application, fostering mutual knowledge exchange with local artisans and designers. Additionally, I will engage in projects focused on using natural, locally sourced materials and traditional skills to address environmental challenges, such as protecting coastal areas in North West England. This initiative will align with the thesis's emphasis on sustainable practices and demonstrate the adaptability of traditional knowledge in addressing modern ecological concerns.

I also plan to work closely with Lancaster City Council, local communities, and stakeholders to rewrite the Climate Change Strategy for the Lancaster district. This work will involve identifying gaps and overlaps in the current strategy, ensuring that the needs and aspirations of local residents are fully incorporated. By aligning this work with the principles of sustainability and community engagement outlined in my thesis, I will contribute to creating a strategy that is both actionable and rooted in the local context.

For design researchers, future studies could expand on this work by:

- Conducting large-scale comparative analyses across multiple cultural contexts to uncover global patterns and local nuances in traditional sustainable practices.

- Exploring the potential of regionally sourced materials and local craft techniques in addressing global sustainability challenges, such as climate adaptation and biodiversity conservation.
- Investigating the role of community-led design initiatives in fostering resilience, particularly in regions vulnerable to environmental risks.

For practicing designers, the frameworks and insights from this thesis will provide practical pathways for integrating traditional knowledge into product development. Designers will be able to experiment with:

- Applying the Adapted Quadruple Bottom Line (QBL) framework to evaluate and enhance the sustainability of their projects.
- Collaborating with communities to co-create products that align with local values and sustainability goals, fostering a place-based approach to sustainable design.
- Exploring the use of local materials and techniques to create solutions that are environmentally sound and culturally meaningful.

To sustain and extend the impact of this work, I will actively participate in design and craft communities, both locally and internationally. This will include engaging with Lancaster's artisan networks, environmental groups, and policymakers, as well as broader networks like the Design Research Society (DRS) and Craft Development Institutes in India. These collaborations will enable me to explore the interplay between traditional practices, local contexts, and global sustainability challenges. I plan to share my findings widely to reach both academic and practitioner audiences. In academic terms, this will involve publishing in journals such as *Design Studies*, *The International Journal of Design*, and craft-focused outlets like *Craft Research Journal* and plan to present at global design conferences, including DRS, Cumulus, and IASDR.

Future work will also delve into the policy implications of integrating traditional knowledge into design practices. This could include exploring economic incentives, regulatory frameworks, and intellectual property rights to protect and promote traditional crafts in contemporary markets.

I am committed to building on the momentum of this research by fostering collaborations, engaging with diverse communities, and driving forward both theoretical and practical advancements. By continuing to explore and advocate for the integration of traditional knowledge into sustainable design, addressing ecological challenges, and co-creating strategies like Lancaster's Climate Change Strategy, I aim to contribute to a more equitable, culturally resonant, and environmentally conscious future for design.

8.5 Concluding remarks

This thesis has embarked on a critical journey to explore what design for sustainability can learn from traditional Indian products and practices, demonstrating how such products and practices can inform and enhance contemporary product design. The research explored the rich heritage of traditional Indian ways of living through detailed case studies and personal narratives from design professionals, revealing their deep cultural significance and practical applications in today's context.

The development of the willow bed prototype, inspired by traditional Indian *charpai* techniques and adapted to local British materials, provided a tangible example of how traditional practices can be reinterpreted to design meaningful and holistically sustainable products. The use of local materials and techniques, ethical production methods, and the integration of cultural meaning into the design underscore the core message of this thesis: that sustainable design can and should embrace cultural heritage.

By applying the adapted QBL framework, this research highlighted the importance of integrating spiritual meanings, cultural values, place-based and context specific knowledge, ethical practices, and holistic well-being into design processes. The prototype exemplified how traditional craftsmanship, when thoughtfully adapted, can contribute to a more meaningful and sustainable approach to product design.

However, the study also acknowledged limitations, such as methodological constraints and challenges in aligning traditional practices with contemporary design needs. These limitations point to areas for future exploration.

This thesis has illuminated the transformative potential of learnings from traditional knowledge for meaningful contemporary design. It advocates for a design paradigm that respects and incorporates cultural values and meanings while addressing contemporary environmental and social challenges. The research not only contributes to the field of sustainable design but also encourages a reevaluation of how we approach product creation, emphasizing the need for designs that are not only efficient but also deeply meaningful and culturally resonant.

In addition to its practical contributions, the thesis critically examined prevailing consumerist, capitalist, and technocratic design approaches. It advocates for a paradigm shift towards life-centered design approaches that prioritize cultural meaning, ethical practices, and holistic well-being. The research argues that traditional practices offer valuable insights for creating designs

that are meaningful and sustainable. This shift requires radical changes, evocative of the rapid adaptations made during the COVID-19 pandemic, challenging conventional business-as-usual models.

Furthermore, the thesis highlights that India, as a case study, represents only a fraction of the world's rich reservoir of traditional knowledge. By ethically drawing inspiration from diverse global traditional knowledge systems, designers can develop resilient, sufficiency-oriented, and humanity and life centered approaches. This broader exploration promises to foster designs that are not only environmentally sustainable but also deeply meaningful and culturally resonant.

In conclusion, the research underscores the need for a fundamental rethinking of design practices, advocating for a shift away from consumerist and technocratic paradigms towards approaches that embrace cultural heritage and holistic sustainability. The insights gained from this study provide a foundation for future research and design practices that seek to balance tradition with modernity, ultimately contributing to a more thoughtful and resilient approach to designing.

9 Appendices

9.1 Appendix 1 – Ethics Approval Form

Research Ethics Application Form v1.3

Research Ethics Application Form v1.3



Learning from Traditional Practices and Products in India to inform Design for Sustainability -

Information Regarding this Research Project

Are you conducting a research project?

(for more information on research projects please see our [ethics pages](#))

Yes No

Does your research only involve animals?

Yes No

Are you undertaking this research as/are you filling this form out as:

- Academic/Research Staff
- Non Academic Staff
- Staff Undertaking a Programme of Study
- PhD or DCinPsy student
- Undergraduate, Masters, Master by Research, MPhil or other taught postgraduate programme

Which Faculty are you in?

Faculty of Arts and Social Science

Which department are you in?

Lancaster Institute for the Contemporary Arts

Will your project require NHS REC approval? (If you are not sure please read the guidance in the information button)

Yes No

Do you need Health Research Authority (HRA) approval? (Please read the guidance in the information button)

Yes No

Have you got external ethical approval from another organisation? For example another University, the NHS, or an institution abroad (e.g. IRB in USA)

Yes No

Is this an amendment to a project previously approved by Lancaster University?

Yes No

Will your research involve any of the following? (Multiple selections are possible, please see icon for details)

- Human Participants
- Data relating to humans (Secondary/Pre-existing data only)
- Data collection from online sources such as social media platforms, discussion forums, online chat-rooms
- Human Tissue
- None of the above

Project Information

Please confirm/amend the title of this project.

Learning from Traditional Practices and Products in India to inform Design for Sustainability

Estimated Project Start Date 15/02/2022

Estimated End Date 31/03/2023

Is this a funded Project?

Yes No

Funding Information

Funding information

What is the ACP Reference?

A103346

What is the Agresso ID?

LCA7094

What is the funding organisation?

Research England

What is your external grant reference? (if you do not have one, please enter "N/A")

N/A

Research Site(s) Information

Will you be using Research Site(s) outside of Lancaster University?

Yes No

Applicant Details

Are you the named Principal Investigator at Lancaster University?

Yes No

Please check your contact details are correct. You can update these fields via the personal details section located in the top right of the screen. Click on your name and email address in the top right to access "Personal details". For more details on how to do this, please read the guidance in the information button.

[Redacted]

First Name

Sejal

[Redacted]

Surname

Changede

[Redacted]

Department

Lancaster Institute of Contemporary Arts

[Redacted]

Faculty

Faculty of Arts and Social Sciences

[Redacted]

Email

s.changede@lancaster.ac.uk

[Redacted]

Please enter a phone number that can be used in order to reach you, should an emergency arise.

07440315218

[Redacted]

Principal Investigator

You have stated that you are the Principal Investigator for this project.

First Name

Sejal

Surname

Changede

Department

Lancaster Institute of Contemporary Arts

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Email

s.changede@lancaster.ac.uk

Supervisor Details

Search for your supervisor's name. *If you cannot find your supervisor in the system please contact rso-systems@lancaster.ac.uk to have them added.*

First Name

Lisa

Surname

Thomas

Department

Lancaster Institute for the Contemporary Arts

Faculty

Faculty of Arts and Social Sciences

Email

l.thomas@lancaster.ac.uk

Do you need to add a second supervisor to sign off on this project?

Yes

No

Search for your secondary supervisor's name. *If you cannot find your supervisor in the system please contact rso-systems@lancaster.ac.uk to have them added.*

First Name

Naomi

[Redacted]
Surname

Jacobs

[Redacted]
Department

LICA

[Redacted]
Faculty

FASS

[Redacted]
Email

neom.jacobs@lancaster.ac.uk

Additional Team Members

[Redacted]

Other than those already added, please select which type of team members will be working on this project:

- I am not working with any other team members.
- Staff
- Student
- External

Details about the participants

[Redacted]

As you are conducting research with Human Participants/Tissue you will need to answer the following questions before your application can be reviewed.

If you have any queries about this please contact your [Ethics Officer](#) before proceeding.

What's the minimum number of participants needed for this project?

8

What's the maximum number of expected participants?

12

Do you intend to recruit participants from online sources such as social media platforms, discussion forums, or online chat rooms?

Yes No

Will you get written consent and give a participant information sheet with a written description of your research to all potential participants?

Yes No I don't know

Will any participants be asked to take part in the study without their consent or knowledge at the time or will deception of any sort be involved?

Yes No I don't know

Is your research with any vulnerable groups?

(Vulnerable group as defined by Lancaster University Guidelines)

Yes No I don't know

Is your research with any adults (aged 18 or older)?

Yes No

Is your research data collected with completely anonymous adult (aged 18 or older) participants, with no contact details or other uniquely identifying information (e.g. date of birth) being recorded?

Yes No

Is your research with adult participants (aged 18 years, or older) in private interactions (for example, one to one interviews, online questionnaires)?

Yes No

Is your research with any young people (under 18 years old)?

Yes No I don't know

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Does your research involve discussion of personally sensitive subjects which the participant might not be willing to otherwise talk about in public (e.g. medical conditions)?

Yes No I don't know

Could the study induce psychological stress or anxiety, or produce humiliation or cause harm or negative consequences beyond the risks encountered in a participant's usual, everyday life?

Yes No I don't know

Is there a risk that the nature of the research topic might lead to disclosures from the participant concerning either:

- Their own or others involvement in illegal activities
- Other activities that represent a threat to themselves or others (e.g. sexual activity, drug use, or professional misconduct)?

Yes No I don't know

Does the study involve any of the following:

- Physically intrusive procedures including touching or attaching equipment to participants
- Administration of substances
- Ultrasound or sources of non-ionising radiation (e.g. lasers)
- Sources of ionising radiation, (e.g. X-rays)
- Collection or use of samples of Human Tissue (e.g. Saliva, skin cells, blood etc.)

Yes No I don't know

Details about Participant relationships

Do you have a current or prior relationship with potential participants? For example, teaching or assessing students or managing or influencing staff (this list is not exhaustive).

Yes No I don't know

If you need written permission from a senior manager in an organisation where research will take place (e.g. school, business) will you gain this in advance of undertaking your research?

Yes No I don't know N/A

Will you be using a gatekeeper to access participants?

- Yes No I don't know if I will be using a gatekeeper

Will participants be subjected to any undue incentives to participate?

- Yes No I don't know

Will you ensure that there is no perceived pressure to participate?

- Yes No I don't know

Participant data

Will you be using video recording or photography as part of your research or publication of results?

- Yes No

Will you be using audio recording as part of your research?

- Yes No

Will you be using audio recordings in outputs (e.g. giving a presentation in a conference, using it for teaching)?

- Yes No

Will you be using portable devices to record participants (e.g. audio, video recorders, mobile phone, etc)?

- No
- Yes, and all portable devices will be encrypted as per the Lancaster University ISS standards, in particular where they are used for recording identifiable data
- Yes, but these cannot be encrypted because they do not have encryption functionality. Therefore I confirm that any identifiable data (including audio and video recordings of participants) will be deleted from the recording device(s) as quickly as possible (e.g. when it has been transferred to a secure medium, such as a password protected and encrypted laptop or stored in OneDrive) and that the device will be stored securely in the meantime

Will you be using other portable storage devices in particular for identifiable data (e.g. laptop, USB drive, etc)? (Please read the help text)

- No
 Yes, and they will be encrypted as per the Lancaster University ISS standards in particular where they are used for recording identifiable data

Will anybody external to the research team be transcribing the research data?

- Yes No

General Queries

Does the funder or any organisations involved in the research have a vested interest in specific research outcomes that would affect the independence of the research?

- Yes No I don't know

Does any member of the research team, or their families and friends, have any links to the funder or organisations involved in the research?

- Yes No I don't know

Can the research results be freely disseminated?

- Yes No I don't know

Will you use data from potentially illicit, illegal, or unethical sources (e.g. pornography, related to terrorism, dark web, leaked information)?

- Yes No I don't know

Will you be gathering/working with any special category personal data?

- Yes No I don't know

Are there any other ethical considerations which haven't been covered?

- Yes No I don't know

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REC Review Details

Based on the answers you have given so far you will need to answer some additional questions to allow reviewers to assess your application.

It is recommended that you do not proceed until you have completed **all of the previous questions**.

Please confirm that you have finished answering the previous questions and are happy to proceed.

I confirm that I have answered all of the previous questions, and am happy to proceed with the application.

Questions for REC Review

Summarise your research protocol in lay terms (indicative maximum length 150 words).

Working title of PhD thesis is 'Learning from Traditional Practices and Products in India to inform Design for Sustainability'. This study aims to critically evaluate modern approaches to Design for Sustainability and argues that these approaches tend to emphasize reducing unsustainability via technological fixes rather than addressing sustainability more holistically. And asserts that more traditional forms of knowledge (associated with deeper ecological, spiritual and ethical values) are important for addressing sustainability more holistically.

Furthermore, we identify traditional Indian products and associated practices that remain relevant to contemporary lifestyles and examines what Design for Sustainability can learn from traditional products and practices that address sustainability in a more comprehensive and holistic manner than is currently the case.

We examine selected products and practices from India in form of case studies. Then we interview designers working with traditional crafts to understand their perspectives on relationship between traditional crafts and sustainability.

State the Aims and Objectives of the project in Lay persons' language.

Following are the basic objectives of the project:

- 1: To critically evaluate modern approaches to Design for Sustainability.
2. To identify traditional Indian products and associated practices that remain relevant to contemporary lifestyles.
3. To compare the traditional Indian products and practices with modern products and practices to determine their relationship to sustainability principles.
4. To design a range of contemporary everyday products that incorporate insights from traditional Indian products and practices.
5. To determine how the products designed for RO no. 4 accord with sustainability principles.
6. To develop a framework for designing contemporary products that incorporate insights from traditional Indian products and practices.

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Please explain the number of participants you intend to include in your study and explain your rationale in detail (eg who will be recruited, how, where from; and expected availability of participants). If your study contains multiple parts eg interviews, focus groups, online questionnaires) please clearly explain the numbers and recruitment details for each of these cohorts (see help text).

I intend to include 6-8 participants. The participants are designers in India who work with traditional crafts. Most of the designers are founders of various platforms like ecommerce websites, firms, social enterprises, which supports and redesigns contemporary products using traditional Indian handicrafts and intervene with craft clusters and craft artisans. I want to interview these designers in order to understand their perspectives on design intervention with traditional crafts and the relationship between traditional crafts and sustainability. Data collection will be by online semi-structured interview as access to participants will not be constrained by geography. It is anticipated that each interview will last between 30 and 60 minutes. Initial contact with participants will be made via direct email. I sourced the email addresses from their websites and LinkedIn profiles.

You have indicated that you will collect identifying information from the participants. Please describe all the personal information that you gather for your study which might be used to identify your participants.

No personal data other than name, organization and position held will be gathered. Participants will be quoted in publications, presentations and the PhD thesis of the applicant of this ethics application; therefore, confidentiality will not be offered. However, pseudonyms will be used and any interview data will be vetted in an attempt to ensure potentially identifying information is removed or concealed.

Please describe how the data will be collected and stored.

Data collection will be primarily by online semi-structured interview, each interview will last between 30 and 60 minutes. Personal information of participants like name, organization and position held will be stored in a separate location from the interview recordings and transcriptions. Transcription will be carried out by the author of this application. The transcriptions will be anonymized. Digital data will be stored on LU OneDrive.

Please describe how long the data will be stored and who is responsible for the deletion of the data.

Data will be stored till the PhD completion and will be deleted by the author of the application.

Participant Relationships

You have indicated that you do not know if you currently have or previously had a relationship with the potential participants. Please provide additional information.

Potential participants are designers from India, who works with traditional crafts. I know two participants as I have worked with them previously in India, they were holding senior positions to me.

Participant Data

Explain what you will video or photograph as part of your project, why it is appropriate and how it will be used.

The online semi-structured interviews conducted via Microsoft Teams or Zoom will be recorded using a university-owned and encrypted laptop in the form of audio and video. Audio recordings will enable researcher to transcribe the interview for data analysis, additionally, it will allow the interviewer to concentrate on the interview rather than writing notes. Video recordings will give an advantage to interviewer to pick details that might have been missed during the actual interview. No direct audio or video will be used in PhD thesis or any publication outputs, only anonymized transcriptions will be used. The audio and video will be kept on university encrypted storage devices and Microsoft OneDrive. The dataset (e.g., anonymized transcripts) will be stored on encrypted data save devices and kept securely for a minimum of ten years on a university server (deposited via Pure) from the end of the project. Audio recordings and Video recordings made on Microsoft Teams will be deleted once transcriptions have been completed and publications have been accepted.

How will you gain consent for the use of video/photography?

Before the interview participants will be provided with an information sheet and consent form (attached to this document). Permission will be requested via initial email to interviewees and a participation information sheet will be attached explaining the project and use of the data. Oral consent will be obtained again before the start of the interview. They will be able to keep the PIS if they have any concerns or questions in terms of their participation.

Participant Information Sheet will include following paragraph,

If you agree then I would like to record the interview in audio and video forms to transcribe the interview for data analysis. No direct audio or video will be used in PhD thesis or any publication outputs, only anonymized transcriptions will be used. The audio and video will be kept on university encrypted storage devices and Microsoft OneDrive. The dataset (e.g., anonymized transcripts) will be stored on encrypted data save devices and kept securely for a minimum of ten years on a university server (deposited via Pure) from the end of the project. Audio recordings and Video recordings will be deleted once transcriptions have been completed and publications have been accepted.

Consent form will include following,

I understand that any interviews will be video and audio recorded and transcribed and that data will be protected on encrypted devices and kept secure.

Oral consent before the interview will include,

If it is OK with you I will record this interview using an audio recording device. The discussion will be then transcribed for analysis. All the information we obtain serves the sole purpose of this study and seen only by me and my supervisors. Your name and any other identifying features will not be used anywhere in reports and other publications emerging from this study.

State your video/photography storage, retention and deletion plans and the reasons why.

The recordings of online interviews will be stored in the project folder on LU's OneDrive folder, which meets GDPR and FASS ethics committee requirements for secure storage of data. Audio recordings and Video recordings will be deleted once transcriptions have been completed, anonymized and publications have been accepted. The dataset (e.g., anonymized transcripts) will be stored on encrypted data save devices and kept securely for a minimum of ten years on a university server (deposited via Pure) from the end of the project.

What would you do if a participant chose to make use of their GDPR right "of being forgotten" or "right to erasure"? Could you remove their data/video/picture from publication? (please see help text)

The list of participants' names will be deleted after the interviews. Audio and video recordings are only used for transcription purpose, no direct audio or video will be used in PhD thesis or publications resulting from this study. Audio and video recordings will be deleted once transcriptions have been completed and publications have been accepted. Data collection methods have been designed to keep data anonymous. The dataset (e.g., anonymized transcripts) will be stored on encrypted data save devices and kept securely for a minimum of ten years on a university server (deposited via Pure) from the end of the project.

Will you take all reasonable steps to protect the anonymity of the participants involved in this project?

Yes No

Explain what steps you will take to protect anonymity.

No personal data other than name, organization and position held will be gathered. This information will be stored in a separate location from the interview recordings and transcriptions. Transcription will be carried out by the author of this application. The transcriptions will be anonymized and the audio files deleted after transcripts are completed. Participants will be quoted in publications, presentations and the PhD thesis of the applicants of this ethics application; therefore, confidentiality will not be offered. However, pseudonyms will be used and any interview data will be vetted in an attempt to ensure potentially identifying information is removed or concealed. Digital data will be stored on LU OneDrive.

Information about the Research

What are your dissemination plans? E.g publishing in PhD thesis, publishing in academic journal, presenting in a conference (talk or poster).

The data and findings will be published in the Sejal Chagede's doctoral thesis. The results of the research may be used in academic activities such as journal articles, conferences, seminars, and lectures. In addition, the research outcomes may include anonymized quotes of the participant for deeper understanding and reliability of the information provided. Pseudonyms will replace their names and their quotes paraphrased to guarantee anonymity.

Data Storage

How long will you retain the research data?

The dataset (e.g., anonymized transcripts) will be stored on encrypted data save devices and kept securely for a minimum of ten years on a university server (deposited via Pure) from the end of the project. The researcher will delete audio recordings once transcriptions have been completed and publications have been accepted.

How long and where will you store any personal and/or sensitive data?

The list of participants' names will be stored on encrypted data save devices and they will be deleted after the interview. Recording of online interviews will be deleted after transcriptions have been completed and anonymized. The recordings will be stored in the project folder on LU's OneDrive until then.

Please explain when and how you will anonymise data and delete any identifiable record?

Audio files will be transcribed by the author of this application and deleted after completion of transcription. Pseudonyms will replace their names and their quotes paraphrased to guarantee anonymity.

Project Documentation*

Important Notice about uploaded documents:

When your application has been reviewed if you are asked to make any changes to your uploaded documents please highlight the changes on the updated document(s) using the highlighter so that they are easy to see.

Please confirm that you have read and applied, where appropriate, the guidance on completing the Participant Information Sheet, Consent Form, and other related documents and that you followed the guidance in the help button for a quality check of these documents. For information and guidance, please use the relevant link below:

[FST Ethics Webpage](#)

[FHM Ethics Webpage](#)

[FASS-LUMS Ethics Webpage](#)

[REAMS Webpage](#)

I confirm that I have followed the guidance.

In addition to completing this form you must submit all supporting materials.

Please indicate which of the following documents are appropriate for your project:

- Research Proposal (DClinPsy)
- Advertising materials (posters, emails)
- Letters/emails of invitation to participate
- Consent forms
- Participant information sheet(s)
- Interview question guides
- Focus group scripts
- Questionnaires, surveys, demographic sheets
- Workshop guide(s)
- Debrief sheet(s)
- Transcription (confidentiality) agreement
- Other
- None of the above.

Please upload the documents in the correct sections below:

Please ensure these are the latest version of the documents to prevent the application being returned for corrections you have already made.

Please upload all consent forms to be used in this project.

Documents					
Type	Document Name	File Name	Version Date	Version	Size
Consent Form	Consent Form_Sejal Changede	Consent Form_Sejal Changede.docx	29/03/2022	3	30.6 KB

Please upload all Participant Information Sheets:

Documents					
Type	Document Name	File Name	Version Date	Version	Size
Participant Information Sheet	Participant information_SejalChangede	Participant information_SejalChangede.docx	29/03/2022	3	47.4 KB

Please upload all different Interview Question Guides.

Documents					
Type	Document Name	File Name	Version Date	Version	Size
Interview question guide	Indicative Interview Guide-V2	Indicative Interview Guide-V2.docx	29/03/2022	3	22.6 KB

Declaration

Please Note

Research Services monitors projects entered into the online system, and may select projects for quality control.

All research at Lancaster university must comply with the LU data storage and governance guidance as well as the General Data Protection Regulation (GDPR) and the UK Data Protection Act 2018. ([Data Protection Guidance webpage](#))

- I confirm that I have read and will comply with the LU Data Storage and Governance guidance and that my data use and storage plans comply with the General data Protection Regulation (GDPR) and the UK Data Protection Act 2018.

Have you that you have undertaken a health and safety risk assessment for your project through your departmental process? ([Health and Safety Guidance](#))

- I have undertaken a health and safety assesment for your project through my departmental process, and where required will follow the appropriate guidance for the control and management of any foreseeable risks.

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When you are satisfied that this application has been completed please click "Request" below to send this application to your supervisor for approval.

Please press "Request" to send this application to your second supervisor.

Please read the terms and conditions below:

- You have read and will abide by [Lancaster University's Code of Practice](#) and will ensure that all staff and students involved in the project will also abide by it.
- If appropriate a confidentiality agreement will be used.
- You will complete a data management plan with the Library if appropriate. [Guidance from Library](#).
- You will provide your contact details, as well as those of either your supervisor (for students) or an appropriate person for complaints (such as HoD) to any participants with whom you interact, so they know whom to contact in case of questions or complaints?
- That University policy will be followed for secure storage of identifiable data on all portable devices and if necessary you will seek [guidance from ISS](#).
- That you have completed the ISS Information Security training and passed the assessment.
- That you will abide by Lancaster University's lone working policy for field work if appropriate.
- On behalf of the institution you accept responsibility for the project in relation to promoting good research practice and the prevention of misconduct (including plagiarism and fabrication or misrepresentation of results).
- To the best of your knowledge the information you have provided is correct at the time of submission.
- If anything changes in your research project you will submit an amendment.

Applicant Only: To complete and submit this application please click "Sign" below:

9.2 Appendix 2 – Participant information Sheet



Participant information sheet: Learning from Traditional Practices and Products in India to inform Design for Sustainability

I am a PhD researcher at ImaginationLancaster, Lancaster University and I would like to invite you to take part in a research study that aims to obtain a better understanding of relationship between traditional knowledge and sustainability and what design can learn from them for a holistic sustainable future.

Please take some time to read the following information before you decide whether or not you wish to take part.

What is the study about?

This study aims to critically evaluate modern approaches to Design for Sustainability and argues that these approaches tend to emphasize reducing unsustainability via technological fixes rather than addressing sustainability more holistically. The study also asserts that more traditional forms of knowledge (associated with deeper ecological, spiritual and ethical values) are important for addressing sustainability more holistically.

Furthermore, we identify traditional Indian products and associated practices that remain relevant to contemporary lifestyles and examines what Design for Sustainability can learn from traditional products and practices that address sustainability in a more comprehensive and holistic manner than is currently the case.

Why have I been asked to take part?

I have approached to you because of your expertise in design and extensive experience working in traditional craft. I hope to exchange some knowledge and understanding about the design intervention in crafts and traditional practices to inform sustainability.

What will I be asked to do if I take part?

If you decided to take part, this would involve the following: an online interview of approximately 30 to 60 minutes.

Do I have to take part?

No. It's completely up to you to decide whether or not you take part. Your participation is voluntary. You are free to stop the interview at any time, without giving a reason and may choose not to answer any of the questions I ask.

What if I change my mind?

If you change your mind, you are free to withdraw up to 2 weeks after taking part in the study. If you want to withdraw, please let me know, and I will extract any ideas or information (=data) you contributed to the study and destroy them. However, it is difficult and often impossible to take out data from one specific participant when this has already been anonymised or pooled together with other people's data. Therefore, you can only withdraw up to 2 weeks after taking part in the study.

What are the possible disadvantages and risks of taking part?

It is unlikely that there will be any major disadvantages to taking part. If any part of the research project to provoke discomfort and strong feelings, you may decide to withdraw from the research without reason and your contributions will be removed as described above.

What are the possible benefits of taking part?

I hope that this process will become an exchange of knowledge and will further our understanding in this area.

Will my data be identifiable?

If you agree to taking part, then I would like to record the interview in audio and video forms to transcribe the interview for data analysis. No direct audio or video will be used in the PhD thesis or any publication outputs, only anonymized transcriptions will be used. After the interview, only myself and my PhD supervisors at Lancaster University will have access to the interview recordings. The audio and video will be kept on university encrypted storage devices and Microsoft OneDrive, they will be deleted once transcriptions have been completed and publications have been accepted.

I will keep all personal information about you (e.g. your name and other information about you that can identify you) confidential, that is I will not share it with others. I will remove any personal information from the written record of your contribution. All reasonable steps will be taken to protect the anonymity of the participants involved in this project.

This study is funded by Research England and they expect us to make our data (anonymised interview transcripts) available for future use by other researchers. We will exclude all personal data from archiving, only anonymised transcribes will be archived. We intend to share the data (anonymised interview transcripts) via the Lancaster University research portal, in line with University guidelines.

How will we use the information you have shared with us and what will happen to the results of the research study?

I will use the information you have shared with me only in the following ways:
I will use it for academic research purposes only (i.e. PhD thesis and journal articles). I may also present the results of my study at academic conferences and in reports.

When writing up the findings from this study, I would like to reproduce some of the views and ideas you shared with me. I will only use anonymised quotes (e.g. from my interview with you), so that although I will use your exact words, all reasonable steps will be taken to protect your anonymity in our publications.

How my data will be stored

Your data (audio, video recordings and transcripts) will be stored in encrypted files (that is no-one other than me, the researcher will be able to access them) and on password-protected computers. I will store hard copies of any data securely in locked cabinets in my office. I will keep data that can identify you separately from non-personal information (e.g. your views on a specific topic). In accordance with University guidelines, I will keep the data securely for a minimum of ten years.

What if I have a question or concern?

If you have any queries or if you are unhappy with anything that happens concerning your participation in the study, please contact myself s.changede@lancaster.ac.uk

If you have any concerns or complaints that you wish to discuss with a person who is not directly involved in the research, you can also contact my head of department:

Professor Alan Marsden, Head of Department for LICA

Office: C37, The LICA Building, Lancaster University, Lancaster, United Kingdom LA1 4YW

Telephone: +44 01524 510817, Email: a.marsden@lancaster.ac.uk

This study has been reviewed and approved by the Faculty of Arts and Social Sciences and Lancaster Management School's Research Ethics Committee.

For further information about how Lancaster University processes personal data for research purposes and your data rights please visit our webpage: www.lancaster.ac.uk/research/data-protection

Thank you for considering your participation in this project.

9.3 Appendix 3 – Semi-Structured Interview Guidelines and Questions

Learning from Traditional Practices and Products in India to inform Design for Sustainability

Good morning/afternoon. I am Sejal Chagede from Lancaster University. I highly appreciate your time in participating in our study that aims to obtain a better understanding of relationship between traditional making and sustainability and what design can learn from them for a holistic sustainable future.

Consent:

Before we start, I would like to run through some points in relation to your consent and what will happen with the data.

- First, there are no right or wrong answers, the idea is to have a discussion together. Feel free to answer questions at your own pace.
- Second, if it is OK with you I will record this interview. The discussion will be then transcribed for analysis. All the information we obtain serves the sole purpose of this study and seen only by me and my supervisors. Your name and any other identifying features will not be used anywhere in reports and other publications emerging from this study.
- Third, you are not obliged to answer any question you do not want to, and you may stop the interview at any time.
- The interview will take more or less 45 mins to 1 hour.

About work

- How you started this firm?
- What are the objectives and motives of your design practice/ firm?
- Why you decided to work with crafts?
- What kind of crafts you work with?
- Why and How you choose to work with these particular crafts?
- What are the barriers when you intervene with these crafts?
- How you solve these barriers?
- Who is your consumer?
- Why they buy craft products? What makes them buy contemporary craft products over traditional craft products?

Sustainability

- Is it important for you to consider sustainability when you design your projects?
- What are the main aspects you consider while designing sustainably?
- How crafts you work with contribute to sustainability?

- What role design plays in this?
- What is the most important consideration from sustainability point of view when you design your projects?
- What is your aim when you design for sustainability?
- Which stages of a product you consider sustainability?
- What do you think about the deeper meaning and spirituality associated with crafts or traditional making? And how it is important for sustainability?
- Why do people buy these products (opposed to mass produced)?
- Do you think sustainability is an important consideration for your buyers?
- What role these traditional products play in end user's life? And what change it brings to day to day life of end user?
- Does using traditional product change anything in end user's activities, does it add value to what they do? For example, if we consider using the similar products like handmade traditional brass glasses vs mass manufactured stainless-steel glasses, do you think handmade products allows you to bring any change in end user's life?

Design for sustainability

- How you chose your materials and where do you source them from?
- How has evolution of sustainable design has impacted you and your design practice over all?
- What are the main barriers you face when attempting to design sustainably?

Design practice, education

- To what extent did you receive inputs on sustainability during your education?
- What have been your main sources of information on sustainability?
- What are the next steps for your company's future and towards sustainability?

9.4 Appendix 4 – Development and Implementation of the Adapted QBL Framework

This appendix provides a comprehensive overview of the development and implementation process for the adapted Quadruple Bottom Line (QBL) framework. It includes:

- The initial sustainable design parameters.
- The iterative development of QBL subcategories.
- The final adapted QBL framework.
- Justifications and reflections on the adaptation process.

Sustainable Design Parameters

To assess contemporary design approaches against Indian traditional practices and products investigated in case studies, I mapped a list of parameters evident in contemporary design for sustainability approaches. The list was developed by creating a list by grouping and short listing the rules of thumb from the Design for Sustainability (D4S) Manual (Crul and Diehl, 2006; Clark et al., 2009; Vezzoli, 2018). The first column is production-to-consumption chain considerations, which are generally considered during designing sustainable products. the second column represent the parameters evident in contemporary sustainability approaches and lastly, six columns represent the six case studies investigated. After mapping the list against a generic production-to-consumption system, and the case studies, it is evident that most of the products accord with contemporary parameters of design for sustainability.

The foundation of the QBL framework draws upon sustainable design parameters, which were categorized across the production-to-consumption chain. These parameters guided the development of the subcategories and are presented in the table below:

Table 18 Sustainable Design Parameters Across the Production-to-Consumption Chain

Production-to-Consumption Chain	Sustainable Design Parameter
Material considerations	Renewable, Low energy consumption, Biodegradable, Recyclable, Recycled, Local materials, Fairly traded, Minimally treated, Supplied by marginalized producers
Production considerations	Minimum material, Less emissions, Minimum production steps, Renewable energy used, Less waste generated/waste reused, Material reduction, Healthy and safe working environment, Fair wages and benefits to producer, Non-discriminatory

Distribution considerations	Minimum weight, Reduction in distribution volume, Minimum packaging, Reusable packaging, Recyclable packaging, Packaging made from reused/recyclable material, Energy-efficient transport for distribution, Localized production and distribution systems
Consumer use considerations	Low energy consumption during usage, Efficient use of consumables during usage, Safe for users' health, Customizable, User-friendly, Affordable, Easy to maintain and repair, Easily upgradeable, Classic design, Promote a strong user-product relationship, Locally repairable and maintainable
End-of-life handling considerations	Designed for disassembly, Mono-material, Recyclable, End-of-life handling facilitates employment for local communities

Below table maps the sustainable design parameters across six case studies—Bed, Broom, Rug, Leaf Plate, Terracotta Pot, and Mortar & Pestle. Each case study was analysed based on its alignment with key parameters along the production-to-consumption chain.

Table 19 Mapping Sustainable Design Parameters Across Case Studies

Production-to-consumption Chain	Sustainable Design Parameter	Case study 1 (Bed)	Case study 2 (Broom)	Case study 3 (Rug)	Case study 4 (Leaf plate)	Case study 5 (Terracotta Pot)	Case study 6 (Mortar & Pestle)
Material considerations	Renewable	•	•	•	•	•	•
	Low energy consumption	•	•	•	•	•	•
	Biodegradable	•	•	•	•	•	•
	Recyclable	•	•	•	•	•	•
	Recycled	•	•	•	•	•	•
	Local materials	•	•	•	•	•	•
	Fairly traded	•	•	•	•	•	•
	Minimally treated	•	•	•	•	•	•
	Supplied by marginalized producers	•	•	•	•	•	•
Production considerations	Minimum material	•	•		•	•	•
	Less emissions	•	•	•	•	•	•
	Minimum production steps	•	•	•	•	•	•
	Renewable energy used						
	Less waste generated/ waste reused	•	•	•	•	•	•
	Material reduction	•	•	•	•	•	•
	Healthy and safe working environment			•			
	Fair wages and benefits to producer			•			
	Non-discriminatory						
Distribution considerations	Minimum weight	•	•	•	•	•	
	Reduction in distribution volume	•	•	•	•	•	•
	Minimum packaging	•	•			•	
	Reusable packaging	•	•			•	
	Recyclable packaging	•	•			•	

	Packaging made from reused/ recyclable material	•	•			•	
	Energy efficient transport for distribution	•	•			•	
	Localized production and distribution systems	•	•	•	•	•	
Consumer use considerations	Low energy consumption during usage	•	•		•	•	
	Efficient use of consumables during usage	•	•		•	•	•
	Safe for users' health	•	•	•		•	•
	Customizable	•	•		•	•	•
	User-friendly	•	•	•	•	•	•
	Affordable	•	•	•		•	•
	Easy to maintain and repair	•	•		•	•	•
	Easily upgradeable	•		•	•	•	•
	Classic design	•	•			•	•
	Promote a strong user – product relationship	•	•	•	•	•	•
Locally repairable and maintainable	•	•	•	•	•	•	
End-of-life handling considerations	Designed for disassembly	•					
	Mono-material	•	•	•	•	•	•
	Recyclable	•	•	•	•	•	•
	End-of-life handling facilitates employment for local communities	•	•	•	•	•	•

Iterative Development of the Adapted QBL Framework

The adapted QBL framework evolved through an iterative process of reflection, analysis, and validation. Below, the developmental iterations and their justifications are presented.

Table 20 Iterations of the Adapted QBL Framework

Dimension	Iteration 1: Hierarchical Organization	Iteration 2: Integrative Subcategory Development	Iteration 3: Streamlined and Actionable Framework
Practical	Material sourcing, production, distribution, usage, disposal.	Sustainability parameters, user interaction, lifecycle.	Focus on material selection, durability, and repairability.
Personal	Self-expression, ceremonial use, health benefits.	Historical/ritual contexts, well-being, narrative connection.	Spiritual, historical values, holistic well-being.

Social	Cultural relevance, community engagement, justice.	Local collaboration, cultural preservation, empathy.	Equity, inclusion, cultural continuity.
Economic	Local systems, job creation, fair practices.	Livelihood support, ethical value chains, circular economy.	Localized supply chains, ethical income generation.

Final Adapted QBL Framework

The finalized framework integrates insights from the iterative development process and is structured as follows:

Table 21 Final Adapted QBL Framework

Dimension	Subcategories
Practical Meaning	Local materials, local manufacturing, energy usage, longevity, maintenance, repair, upgrade, customize, disposal.
Personal Meaning	Self-expression, identity, historical significance, ceremonial use, spiritual values & beliefs, rituals, health benefits.
Social Meaning	Local culture, community involvement, co-creation, co-dissemination, equity, cultural continuity.
Economic Means	Local production-to-consumption systems, ethical practice, livelihood, job creation.

The iterative development process ensured that all dimensions of the QBL are fulfilled, addressing the practical, personal, social, and economic aspects of sustainability. The following principles guided the adaptation:

Contextual Relevance: Tailoring the framework to Indian traditional products ensures cultural, social, and environmental applicability.

Sustainability Integration: Embedding actionable sustainable design parameters across all dimensions.

Bridging Theory and Practice: Extending Walker’s conceptual QBL framework by applying it in empirical and autoethnographic case studies, particularly within the context of traditional crafts.

To illustrate the framework’s application, the case study of the stone mortar and pestle is discussed in Chapter 4. The elements of the traditional product were mapped against the QBL dimensions using this adapted framework (see Chapter 7 for the Willow Bed example).

The adapted QBL framework is a robust, actionable tool for integrating sustainability considerations into design processes, particularly in cultural and traditional contexts. By balancing practical, personal, social, and economic dimensions, it ensures holistic sustainable design.

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